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Driving Project Success Through Sustainable Planning and Technology Utilization

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Abstract

The primary objective of this study is to investigate the extant correlation among sustainable project planning, the utilization of project management information, and project success. Furthermore, the research employs the deployment of project management information as a mediating variable, while project manager satisfaction serves as a moderating variable in delineating the connection between the utilization of project management information and project success. This study gathered data from 239 employees in the interior design and construction industry in Saudi Arabia. The research utilized Partial Least Squares (PLS) software with a Structural Equation Modelling (SEM) approach to accomplish its objectives. The research reveals a notable correlation between sustainable project planning and project success, as well as between sustainable project planning and the utilization of project management information. Furthermore, the study confirms that project manager satisfaction moderates the relationship between sustainable project planning and the use of project management information. Additionally, the use of the project management information system significantly serves as a mediator in the association between sustainable project planning and project success. This research contributes to the scholarly discourse by establishing connections among technology utilization, project manager satisfaction, sustainable project management, and the success of interior design and construction projects in Saudi Arabia. The results underscore the imperative of incorporating sustainability considerations into project design and leveraging technology to enhance sustainability outcomes. These insights have implications for interior design and construction enterprises striving for both project success and sustainability.

Keywords: Sustainable Project Management, Project Management Information Systems (Pmis), Project Success, Interior Designing, Construction Industry.

Introduction

In contemporary business practices, there is a growing acknowledgment of the necessity to integrate environmental, social, and economic considerations into project planning and implementation. As a result, sustainable project management is gaining increased prominence across various domains in organizational research (Calderon-Tellez et al., 2024; Haloul et al., 2024). Sustainable project management employs principles, methodologies, and resources to yield project outcomes that are environmentally sustainable, socially equitable, and economically viable (Wei et al., 2023). The research scope encompasses PMIS, sustainable project planning, stakeholder participation, and environmentally responsible procurement (Mwangi & Yusuf, 2023; Peng, 2024). The integration of sustainability in project management mitigates environmental and social impacts, enhances organizational competitiveness, and contributes to the attainment of sustainability objectives at local, regional, and global levels (Mohite et al., 2024).

Scholarly investigations into sustainable project management across diverse industries have elucidated aspects related to project planning, execution, and culmination (Fajarwanto et al., 2023; Mahmood et al., 2023). Multiple studies advocate the integration of sustainability into project management to align with environmental, social, and economic objectives (Takagi et al., 2024; Ton et al., 2024). Yin et al. (2024) assert that integrating sustainable project planning leads to improved corporate project outcomes, yielding cost savings, heightened stakeholder satisfaction, and reduced environmental impact. Abdulla and McCauley-Smith (2024) discovered that sustainable project management enhances scheduling, budget adherence, and customer satisfaction, aligning project performance with corporate goals. Phung et al. (2023) examined the positive impact of project management information systems on collaboration, communication, and decision-making in environmentally responsible project management. Blak Bernat et al. (2023) found that project management information systems contribute to translating long-term strategy into tangible results, emphasizing the preference for technology-driven solutions for project success.

Previous research in sustainable project management has identified several knowledge gaps requiring further exploration and clarification (Mahmood et al., 2023; Wu et al., 2023). The field lacks sufficient research on critical contextual factors influencing sustainable project management, including the impact of organizational culture, regulatory frameworks, and project complexity (Vrečko et al., 2023). Nevertheless, sustainability initiatives enjoy robust support, and effective strategies for facilitating sustainable project management across diverse organizational contexts necessitate a comprehensive understanding. Mwangi et al. (2023) advocate for the adoption of all-encompassing frameworks addressing every facet of environmentally conscious project management. Presently, sustainability research places higher emphasis on environmental concerns and stakeholder involvement compared to considerations of system interconnection and trade-offs. The incorporation of comprehensive frameworks encompassing environmental, social, and economic sustainability is posited as beneficial for fostering a nuanced understanding of sustainable project management and its implications on project outcomes (Wei et al., 2023). While previous research primarily emphasizes the direct impact of sustainable project management on outcomes, this study diverges by not exploring regulatory and intermediary processes that could elucidate these connections. Additionally, other studies have investigated the role of project management information systems in promoting the success of sustainable project planning (Blak Bernat et al., 2022). Limited research has delved into mediators or modifiers, such as project manager traits or organizational culture, within the context of sustainable project management (Choi & Ha, 2022; Purohit et al., 2022). A comprehensive examination of these processes can elucidate the mechanisms through which sustainable project management influences the achievement of project objectives (Ika & Pinto, 2022; Maritim, 2022). Integrating more sustainability measures in project management boosts success. Addressing research gaps is vital for applying sustainable project management in interior design and construction, enhancing industry understanding and applicability.

This study is grounded in organizational behaviour, stakeholder theory, and contingency theory. Stanitsas and Kirytopoulos (2022) posit that organizational

behaviour theories provide insights into project team dynamics, illustrating the influence of leadership, work satisfaction, and motivation on project team performance. Stakeholder theory elucidates the expectations and interests of project participants and their impact on project outcomes (Plattfaut, 2022). Contingency theory asserts that management methods are effective when aligned with organizational settings, encompassing factors like project complexity, environmental unpredictability, and technology capacity (Ayier, 2022). Building on these theoretical foundations, the research investigates the influence of project manager satisfaction on project planning and sustainability, aiming to elucidate principles of sustainable project management.

Literature Review

The imperative to integrate environmental, social, and economic considerations into the planning and execution of projects has elevated the significance of sustainability in project management (Orazulike, 2022). Numerous academic studies have demonstrated that the comprehension of environmental, social, and economic considerations has contributed to the increased sustainability of project management (Boateng, 2021; Chow et al., 2021). Silvius (2021) and Vrečko et al. (2023) contend that the research sheds light on intricate sustainability challenges. Furthermore, this analysis underscores the imperative to integrate sustainability criteria into the processes of project selection, execution, and assessment. Experts have highlighted the necessity of intertwining project and sustainability goals. Evolving performance evaluation methodologies, business cultures, stakeholder engagement initiatives, and project management structures are identified as essential by Zaleski and Michalski (2021) and Magano et al. (2021). Researchers evaluated factors contributing to the success of sustainable projects, including skills, knowledge, and leadership. Ahmad et al. (2021) and Micale et al. (2021) emphasized the importance of project managers comprehending stakeholder interactions, legislation, and sustainability principles.

Sankaran et al. (2021) and Woźniak (2021) assert that sustainable project management necessitates addressing both social and environmental implications, emphasizing smart long-term planning and proactive mitigation. Irfan et al. (2021) underscores the importance of considering financial, environmental, and social aspects throughout project initiation, planning, and execution, requiring rigorous

sustainability, social impact, and green procurement assessments. The discourse revolves around "project success," encompassing meeting budget, time, and quality goals. Wei et al. (2023) and Vrečko et al. (2023) find a robust impact of sustainable project planning on success metrics, with project design guided by sustainability principles enhancing environmental efficiency, sustainable development, and stakeholder satisfaction (Wu et al., 2023). Mahmood et al. (2023) and Fajarwanto et al. (2023) reveal that sustainable project design enhances resource efficiency, cost savings, and project performance across various industries. Mahmood et al. (2023) assert that sustainable corporate project management contributes to the well-being of stakeholders, society, and the environment, ultimately resulting in enhanced project efficiency and long-term profitability, as elucidated by Blak Bernat et al. (2023).

H1. *Sustainable project planning significantly influences the project success.*

Recent research underscores the connection between sustainable project planning & PMIS. For instance, Bernat et al. (2023) examined the adoption and application of PMIS for sustainable project management. Sustainability-focused project planners utilize PMIS for stakeholder communication, involvement, and decision-making (Phung et al., 2023). Abdulla et al. (2024) found that PMIS tracking resource consumption, environmental performance indicators, and stakeholder participation are associated with sustainability. Yin et al. (2024) highlight the use of PMIS by sustainability project teams for planning and executing projects. The data indicates that the adoption and utilization of PMIS are integral to sustainable project planning, with evidence pointing to a connection between sustainability and project management information systems through data integration. Environmental project planners have been observed to incorporate project management information systems into their practices. Takagi et al. (2024) advocate for data management and information sharing as essential components for sustainable project planning, facilitating performance reviews, environmental impact analyses, and stakeholder communications. Aligning with sustainability standards in PMIS, encompassing scheduling, risk management, and reporting, allows for the harmonization of project and sustainability goals. Consequently, accountable, transparent, and sustainable enterprises are encouraged to leverage project management information systems.

Furthermore, the integration of sustainable project planning is posited to enhance overall project performance, as suggested by Ton et al. (2024). Research findings support the utility of eco-friendly project planning and PMIS. Mohite et al. (2024) contend that investment in PMIS contributes to enhanced corporate sustainability, improving environmental data, enabling real-time decision-making, and optimizing project management. Calderon-Tellez et al. (2024) argue for the strategic use of project management information systems by project managers to integrate sustainability practices and streamline corporate sustainability reporting, emphasizing the significant influence of sustainable project planning on the adoption of project management information systems.

H2. *Sustainable project planning significantly influences the use of the project management information system.*

Empirical studies have emphasized the interplay between Project Management Information Systems (PMIS) deployment, sustainable project planning, and project success. Blak Bernat et al. (2023) investigated how PMIS connects sustainable project management practices to project outcomes, suggesting their essential role in translating long-term planning into measurable success. Purohit et al. (2022) discovered that the sustainability of organizational management information systems enhances project performance, contributing to stakeholder satisfaction and sustainability. Choi et al. (2022) underscore the necessity of PMIS for ensuring effective project planning and execution. Achieving project success necessitates collaboration among all stakeholders. Environmentally responsible project management relies on technology-driven solutions, as demonstrated by Blak Bernat et al. (2022). Their illustration highlights how PMIS streamline sustainable project planning. The theory posits that PMIS play a pivotal role in governing the association between project success and environmentally conscious project planning (Ayier, 2022). Ika et al. (2022) found that firms employing Project Management Information Systems (PMIS) for sustainable project management achieve greater professional success. Chow et al. (2021) noted that PMIS aids businesses in achieving long-term goals, tracking progress, and adjusting strategies. Plattfaut (2022) highlights the enhancement of long-term project planning, cost management, time management, quality control, and stakeholder satisfaction through Project Management

Information Systems. This platform facilitates data-driven decision-making by simplifying data collection, analysis, and supporting operations. Wu et al. (2023) suggest that using PMIS links project completion to long-term sustainability planning, and without it, sustainability projects become challenging. Empirical studies indicate that PMIS improves strategic planning and project execution, according to (Fajarwanto et al., 2023). The linkage of sustainability-focused project management to increased stakeholder satisfaction and project effectiveness is emphasized. Abdel- (Blak Bernat et al., 2023) explored how PMIS promotes sustainable project planning and successful building projects, underlining the relevance of cutting-edge technologies in sustainability (Wei et al., 2023). Overall, studies reveal that Project Management Information Systems improve project planning and sustainability, and utilizing them to promote green project management can enhance firm project outcomes (Abdulla et al., 2024).

H3. *Use of project management information system significantly mediates the relationship of sustainable project planning and project success.*

Past empirical research has delved into project managers' well-being, sustainable planning, and project completion success. Sankaran et al. (2021) investigated the influence of project managers' satisfaction on these variables, finding that their views, attitudes, and job satisfaction impact sustainable project management. Magano et al. (2021) linked project manager enjoyment to success, revealing that unhappy project managers tend to be more focused, determined, and critical when facing challenges. Zaleski et al. (2021) asserted that project managers' job satisfaction influences project success and planning longevity, with satisfied project managers exerting more influence on outcomes (Boateng, 2021). The research also suggests that project managers' satisfaction moderates sustainable project management, impacting both project completion and planning sustainability (Orazulike, 2022). Overall, studies indicate that project manager satisfaction may significantly influence the effectiveness of sustainable project planning, proposing that content project managers lead, collaborate, and adeptly address challenges during the implementation of sustainable initiatives. Plattfaut (2022) asserts that content project managers are more likely to guide, focus, and dedicate themselves to projects, crucial for success. The hypothesis posits that project managers' satisfaction

moderates project completion and sustainable planning (Mangi et al., 2023; Maritim, 2022; Qamar et al., 2023), influencing the incorporation of sustainability into project management. Research suggests that project managers' happiness is linked to sustainable project management, impacting leadership and success (Purohit et al., 2022). Zaleski et al. (2021) studied stakeholder, project management, and sustainable project planning satisfaction, revealing that project managers' attitudes significantly affect project success. These findings collectively highlight that project managers' satisfaction plays a substantial role in project success and planning longevity (Micale et al., 2021), emphasizing the potential improvement of long-term success through the well-being of project managers and supportive workplace environments.

H4. *Project manager satisfaction significantly moderates the relationship of use of project management information system and project success.*

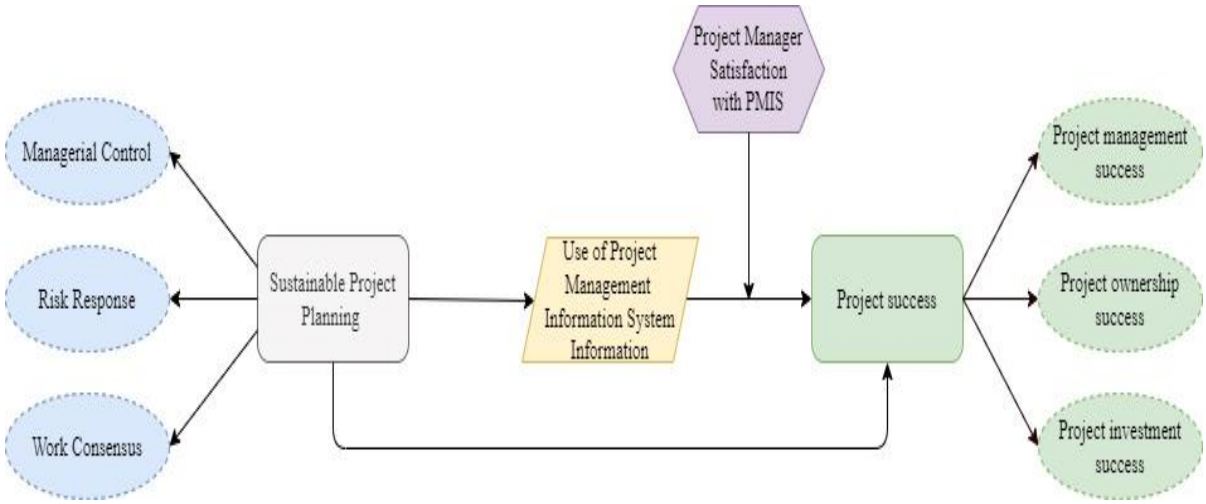

Figure 1: Proposed Model.

Methodology

This research investigated the impact of sustainable project planning, PMIS implementation, project managers' satisfaction, and project completion likelihood on the interior design and construction sector in Saudi Arabia, involving 239 individuals from diverse cities and company positions. The PLS-SEM method was employed for data analysis due to its effectiveness in managing complex variable interactions with limited sample sizes. The study utilized reliable measurement scales from prior research to assess PMIS use, sustainable project planning, project manager satisfaction, and project success. The assessment methods evaluated the integration of sustainability into project planning processes and the overall sustainability of the

projects. Notably, PMIS were evaluated based on their use in project management operations. Project managers' job satisfaction was measured to gauge their contentment, while project performance was assessed in terms of goal achievement, adherence to timeframes, and quality standards. A ten-item scale for sustainable project planning, with three sub-dimensions, was adopted from Chow et al. (2021). The use of project management information systems was assessed using a five-item scale from Caniëls and Bakens (2012). Project manager satisfaction with PMIS was measured with a five-item scale from Caniëls et al. (2012). Project success was evaluated using an eleven-item scale with three sub-dimensions from Ul Musawir et al. (2017).

Standard questionnaires were distributed either in person or online based on participants' interests and availability. The questionnaire covered a broad range of interests and demographic characteristics, including age, gender, years of professional experience, and education. Confidentiality was assured to participants before data collection commenced. Subsequently, PLS-SEM analysed the collected data, assessing the validity and reliability of the measuring scales using the study's approach. The structural model was scrutinized to identify linkages, exploring the connections between project managers' satisfaction, PMIS utilization, sustainable project planning, and project completion. Bootstrapping was employed to confirm the statistical significance of the proposed correlations and examine indirect effects. Following the investigation, the findings were evaluated to ascertain correlations and project performance factors within the interior design and construction industry in Saudi Arabia.

Results

Cronbach's Alpha was employed to assess the reliability of sustainability and project management factors, with results presented in Table 1. Cronbach's Alpha measures the internal consistency reliability of a construct by evaluating how well items measure the same concept, often referred to as the dependability coefficient. The study calculated Cronbach's Alpha coefficients ranging from 0.723 to 0.880 for various hypotheses and concepts. A high Cronbach's Alpha score, approaching 1, indicates that the items of a construct reliably assess the same underlying concept.

Table 1: Cronbach's Alpha.

	Cronbach's Alpha
Manager satisfaction with PMIS	0.804
Managerial control	0.802
Project investment success	0.876
Project management success	0.772
Project ownership success	0.787
Project success	0.796
Risk Response	0.723
Sustainable project planning	0.880
Use of project management information system	0.847
Work Consensus	0.745

Management satisfaction with PMIS, managerial control, project investment success, project management success, project ownership success, project success, sustainable project planning, PMIS utilization, and work consensus demonstrated excellent internal consistency with Cronbach's Alpha ranging from 0.772 to 0.880. These constructs affirm the reliability of the study's measurement instrument, consistently measuring the intended notions. However, the Cronbach's Alpha for risk response was 0.723, lower than the others, indicating less consistency in this construct. To enhance the assessment of risk response in sustainable project management, adjustments or validation of items may be necessary. While acceptable, this highlights the potential need for refinement. Cronbach's Alpha analysis provides insight into the reliability and consistency of the measurement instrument across various constructs, thereby enhancing the credibility of the study's findings.

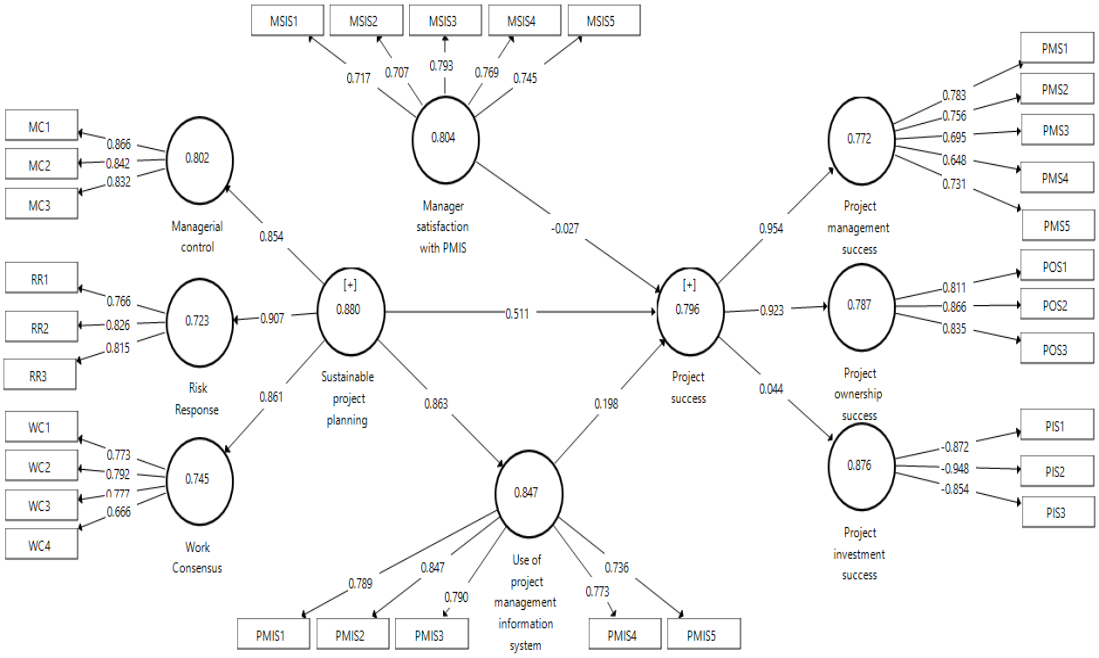

Figure 2: Estimated Model.

Table 2 displays factor loadings, composite reliability, and AVE for project success, sustainable project planning, and project management information systems structures. Factor loadings closer to 1 indicate stronger item-construct relationships. Composite reliability measures inherent consistency, and results above 0.7 are considered acceptable. Convergent validity, exceeding 0.5, reflects average variance versus measurement error. Most constructs exhibit favourable factor loadings, composite reliability, and average variance recovery, validating the study's measuring instrument with robust measurement properties.

Table 2: Factor Loadings, Composite Reliability, and Average Variance Extracted (AVE).

			Original Sample (O)	Composite reliability	Average variance extracted
Project Success	Project Investment Success	PIS1	0.872	0.921	0.796
		PIS2	0.948		
		PIS3	0.854		
	Project Management Success	PMS1	0.783	0.846	0.525
		PMS2	0.756		
		PMS3	0.695		
		PMS4	0.648		
		PMS5	0.731		
	Project Ownership Success	POS1	0.811	0.876	0.701
		POS2	0.866		
		POS3	0.835		
Sustainable Project Planning	Managerial Control	MC1	0.866	0.884	0.717
		MC2	0.842		
		MC3	0.832		
	Risk Response	RR1	0.766	0.844	0.644
		RR2	0.826		
		RR3	0.815		
	Work Consensus	WC1	0.773	0.840	0.568
		WC2	0.792		
		WC3	0.777		
		WC4	0.666		
	Manager Satisfaction with PMIS	MSIS1	0.717	0.863	0.558
		MSIS2	0.707		
		MSIS3	0.793		
		MSIS4	0.769		
		MSIS5	0.745		
	Use of Project Management Information System	PMIS1	0.789	0.891	0.621
		PMIS2	0.847		
		PMIS3	0.790		
		PMIS4	0.773		
		PMIS5	0.736		

Table 3 presents the results of the HTMT criterion analysis, determining

construct differentiation through the comparison of construct correlations. Table 3 displays HTMT values for the two dimensions, with positive discriminant validity indicated by scores below 0.85, signifying differences between constructs. All component HTMT values are below 0.85, demonstrating sufficient discriminant validity. Individual HTMT values for constructs are much lower than 0.85, indicating weaker linkages between constructs than within them. This suggests that the constructs assess distinct ideas with low correlation, affirming the concept distinction of the research project's measuring instrument. In summary, the HTMT criterion analysis accurately characterizes sustainable project management constructs, supporting the study's findings and enhancing confidence in the results.

Table 3: HTMT Criterion.

	1	2	3	4	5	6	7	8	9	10
Manager satisfaction with PMIS										
Managerial control	0.701									
Project investment success	0.061	0.025								
Project management success	0.644	0.784	0.085							
Project ownership success	0.573	0.669	0.067	0.872						
Project success	0.591	0.687	0.559	0.351	0.349					
Risk Response	0.710	0.722	0.115	0.808	0.730	0.762				
Sustainable project planning	0.728	0.775	0.071	0.795	0.688	0.720	0.127			
Use of project management information system	0.792	0.794	0.057	0.740	0.663	0.675	0.870	0.799		
Work Consensus	0.828	0.706	0.064	0.668	0.563	0.601	0.663	0.742	0.793	

Table 4 presents the results of the Fornell-Larcker criterion analysis, evaluating the discriminant validity of constructs in the structural equation model. Diagonal values represent the square root of the extracted average variance, indicating the variance allocated to each component construction. Off-diagonal values display interconstruct correlations. Discriminant validity is confirmed when the square root of the average variance extracted (AVE) for each construct is larger than its correlations with other constructs. The averages are as follows: Manager PMIS satisfaction (0.747), project success (0.528), sustainable project planning (0.770), and PMIS utilization (0.811), indicating distinct model builds. Moderate construct similarity suggests convergent validity, supporting the study's trustworthiness, measurement model validity, and construct uniqueness.

Table 4: Fornell-Larcker Criterion.

	1	2	3	4
Manager Satisfaction with PMIS	0.747			
Project Success	0.528	0.616		
Sustainable Project Planning	0.770	0.662	0.695	
Use of Project Management Information System	0.811	0.617	0.863	0.788

Table 5 displays model fitness statistics, including Q2predict, RMSE, and MAE, commonly used to assess the structural equation model's prediction performance and fit. The Q2predict statistic, representing the percentage of endogenous variable variance attributed to external variables, is 0.450, indicating that the model explains 45% of endogenous variable variance with modest predictive relevance. Model accuracy is assessed by RMSE and MAE, with the model's predictions accurate within RMSE of 0.052 and MAE of 0.059. The structural equation model exhibits good fit with moderate predictive relevance and accurate endogenous variable prediction. However, interpretation should consider other model fit indices, study context, and model fit goals.

Table 5: Model Fitness.

Q^2predict	RMSE	MAE
0.450	0.052	0.059

Table 6 presents R-Square values for two critical constructs: "project success" and "use of project management information system." The R-Square, or coefficient of determination, measures the variance contribution of independent variables in the regression model. For "project success," the R-Square is 0.446, indicating that 44.6% of its variation is explained by the model's independent variables. This suggests some predictive power, although other factors may influence project effectiveness. In contrast, "use of project management information system" has a higher R-Square of 0.744, meaning that the model's independent variables explain 74.4% of PMIS usage variance. This indicates that the model accurately characterizes PMIS use in the study, demonstrating high explicative power. Combined R-Square values offer insights into how much independent variables explain dependent variable variability, evaluating the explanatory power and variable relationships in regression models.

Table 6: R-Square.

	R Square
Project Success	0.446
Use of Project Management Information System	0.744

Table 7 displays F-statistics for various construct pairs in the structural equation model. The F-statistic tests the null hypothesis that all regression model coefficients are zero, determining the model's overall significance. A high F-statistic indicates statistical significance, suggesting at least one independent variable is significantly related to the dependent variable. The table lists F-statistics for specific construct pairs, highlighting the relevance of their relationships. For instance, the absence of an F-statistic in the rows for manager satisfaction with the PMIS and project success suggests no direct comparison of these constructs. Conversely, successful and sustainable project planning exhibit non-zero F-statistics, indicating a statistically significant association between project completion and sustainable project planning. Notably, the F-statistic for the association between sustainable project planning and Risk Response signifies a strong connection. Overall, F-statistics aid in assessing the relevance of interactions between structural equation model constructs, providing valuable information for decision-making, model fitting, and identifying noteworthy links requiring further study and interpretation.

Table 7: F-statistics.

	Managerial Control	Project Management Success	Project Ownership Success	Project Success	Risk Response	Use of Project Management Information system	Work Consensus
Manager Satisfaction with PMIS							
Project Success		10.016	5.770				
Sustainable Project Planning	2.697			0.114	4.632	2.907	2.855
Use of Project Management Information System							

Table 8 presents path analysis results, revealing significant associations among sustainable project planning, PMIS use, project manager satisfaction, and project success. Route coefficients indicate correlation intensity and direction, while STDEV, T statistics, and P values signify their importance. Sustainable project planning strongly influences project success (T = 3.032, P = 0.001), with a positive path value of

0.423, emphasizing its promotion of success. The study emphasizes the importance of integrating sustainability into project planning for improved performance and organizational sustainability goals. PMIS use and sustainable project planning are notably associated (T = 32.620, P = 0.000), with a path coefficient of 0.863 indicating PMIS promotes sustainable project planning. This highlights how businesses prioritizing sustainability in project planning are inclined to use technology-enabled solutions like PMIS, showcasing the role of sustainability-focused ideas and technologies in project success.

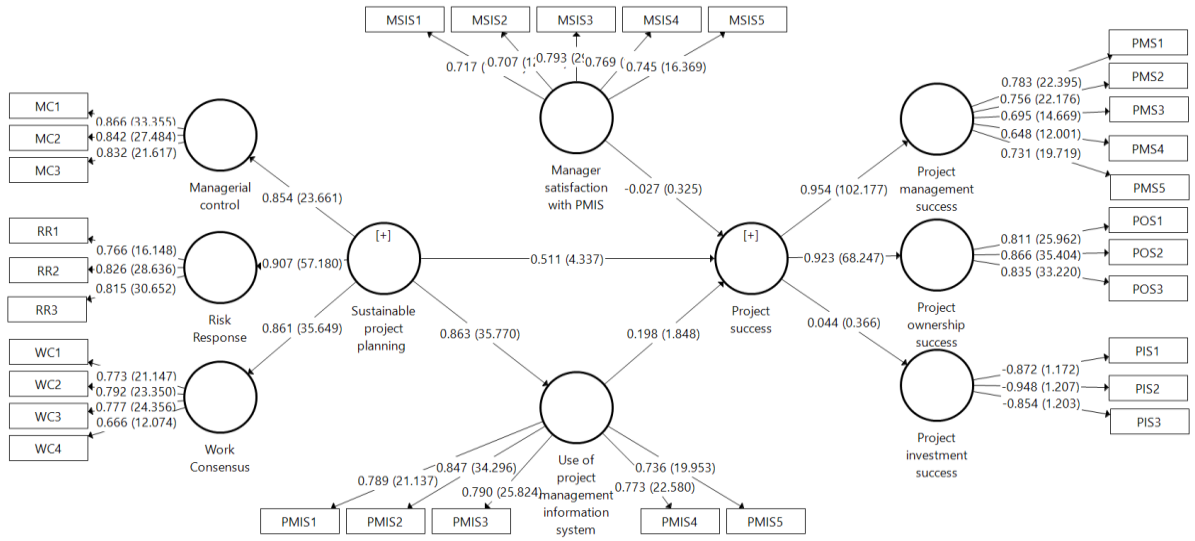

Figure 3: Structural Model for Direct and Mediating Paths.

The analysis indicates that project management information systems mediate the relationship between sustainable project planning and success (T = 3.013, P = 0.001). With a path coefficient of 0.391, it suggests that PMIS plays a mediating role in translating the impact of sustainable project planning into tangible project outcomes, enhancing project success and overall organizational performance.

Table 8: Path Analysis.

	Original Sample	STDEV	t Statistics	p Values
Sustainable project planning significantly influences the project success.	0.423	0.140	3.032	0.001
Sustainable project planning significantly influences the use of the project management information system.	0.863	0.026	32.620	0.000
Use of project management information system significantly mediates the relationship of sustainable project planning and project success.	0.391	0.130	3.013	0.001
Project manager satisfaction significantly moderates the relationship of use of project management information system and project success.	-0.078	0.040	1.947	0.026

In conclusion, project manager satisfaction moderates the relationship between the use of project management information systems and project success (T = 1.947, P = 0.026). Despite the negative path coefficient (-0.078) indicating a decreasing effect, the significance of the connection implies that project manager satisfaction plays a moderating role in the impact of sustainable project planning on project success. This finding underscores the significance of individual attitudes and perceptions within the context of sustainable project management, emphasizing the organizational need to prioritize the well-being and contentment of project managers to enhance overall project outcomes. The path analysis reveals the intricate interplay between sustainable project management, technology utilization, manager satisfaction, and project success.

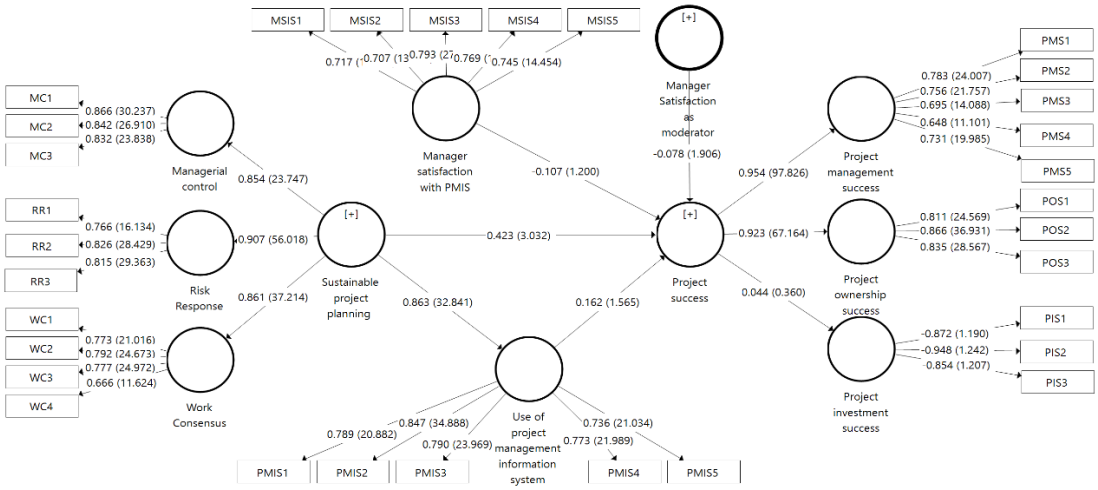

Figure 3: Structural Model for Moderating Path.

Discussion

In the context of the dynamic nature of project management, integrating sustainable business practices is imperative. Industries grappling with climate change, resource scarcity, and social inequality find strategic and ethical value in incorporating sustainability principles into project design and implementation. Sustainable project management not only ensures the achievement of budget, time, and quality goals but also contributes to societal and environmental well-being. This discussion chapter explores the intricate interplay between sustainable project planning, project manager satisfaction, PMIS, and project completion, demonstrating the transformative potential of sustainable project management based on empirical evidence and theoretical foundations. It underscores how sustainable project management can drive positive development and change.

The study affirms hypotheses that sustainable project planning positively influences both PMIS use and project success, highlighting the significance of sustainability in project development for enhanced outcomes and PMIS utilization. Organizations can leverage project management information systems to align project goals with sustainability objectives, facilitating improved stakeholder communication, environmental impact monitoring, and performance evaluation. Integrating sustainability criteria into PMIS is shown to enhance project outcomes, emphasizing the success and longevity of projects combining technological solutions with sustainability principles, as indicated by previous research (Orazulike, 2022; Wei et al., 2023). Implementing Project Management Information Systems impacts project efficiency and environmental consciousness. PMIS facilitates strategic project planning, ensuring both short-term and long-term sustainability. The integration of project management information systems and sustainable project management suggests that leveraging technology for sustainability can enhance overall project outcomes. These systems empower sustainable businesses to streamline stakeholder engagement, communication, and decision-making, enabling them to address sustainability issues, mitigate risks, and capitalize on opportunities. Sustainable project management organizations should strategically utilize these foundational principles in their planning processes, emphasizing sustainability, project management, and technology. A well-organized approach ensures value, innovation, flexibility, and long-term success, with Project Management Information Systems contributing to financial success while promoting societal and environmental enhancement through the incorporation of sustainability standards into project management (Vrečko et al., 2023). The article underscores the utilization of financial and diverse resources to enhance project management through the incorporation of sustainability. Acknowledging the widespread consensus on these principles, sustainable project management emerges as a potent instrument with substantial potential to revolutionize the attainment of objectives and foster the growth of enterprises and communities on a global scale.

The study verified the third and fourth hypotheses, uncovering the intricate connection among sustainable project planning, project manager well-being, and project success. The research identified a robust association between project managers'

job satisfaction, tenure, and project success, underscoring the need to incorporate individual perspectives and traits into long-term project management strategies. Content project managers exhibit heightened dedication, persistence, and drive, positively impacting project outcomes. Achieving successful project planning necessitates prioritizing project managers' satisfaction, addressing sustainable project challenges, fostering teamwork, and cultivating a collaborative work environment. Mahmood et al. (2023) emphasize the critical role of project manager satisfaction in achieving long-term project management success. Supporting data underscores the need for prioritizing the well-being and contentment of project managers in the context of sustainable project management practices. Recognizing the pivotal role of experienced project managers in successful project planning and execution, organizations should provide incentives, conducive work environments, and proper tools to enhance job satisfaction and overall project success. Investing in leadership, talent, and project management can contribute to sustainability, risk reduction, and seizing opportunities, ultimately enhancing project success. The viability of a project hinges on expertise in organizational behaviour, risk management, and adept stakeholder relationship management (Phung et al., 2023). Understanding the dynamics within a project team is facilitated by employing an organizational behaviour framework. Success in a project is contingent upon robust leadership, satisfied team members, and motivation. Stakeholder theory elucidates how the interests and expectations of project participants influence the final project outcome. The efficacy of a management approach relies on its ability to address the technical competencies of stakeholders, the level of environmental uncertainty, and the complexity of the project, as posited by the contingency hypothesis. Utilizing these theoretical concepts, organizations can formulate enduring project management systems (Bernat et al., 2023). These frameworks enable a comprehensive exploration of the intricate relationships among sustainability, project management, and project outcomes, offering valuable insights for both businesses and society.

To achieve sustainability objectives beyond project performance assessments, sustainable project management can leverage the following four recommendations. Addressing prevailing challenges, sustainable project management fosters innovation,

adaptability, and enduring advantages. This approach enhances project manager satisfaction and facilitates the integration of new technologies within enterprises by streamlining the planning process. Sustainable project management proves instrumental in effectively managing uncertainty, seizing opportunities, and mitigating risks. Furthermore, it aligns with stakeholder expectations, meeting the demands of both individuals and the environment. In the contemporary business landscape, proficiency in sustainable project management practices is essential for professionals, scholars, and decision-makers alike.

This study delves into the intricate interplay among project managers' satisfaction, project success, sustainable project planning, and project management information systems, offering valuable insights. The findings underscore the imperative for project management to integrate sustainable practices and leverage technology for their support. The study elucidates how sustainable project planning positively influences project performance, with PMIS playing a supportive role. The identification of project managers' satisfaction as a moderator underscores the importance of considering individual perspectives in the implementation of sustainable project management practices. While contributing to our understanding of sustainable project management, this research acknowledges existing limitations. Addressing these limitations and conducting further research into the mechanisms and contextual factors influencing sustainable project management will better equip businesses to navigate sustainability challenges and opportunities, fostering success. In summary, this study underscores the necessity of integrating sustainability elements into project management approaches for enhanced environmental, social, and economic sustainability, thereby contributing to the knowledge base of sustainable project management.

Implications of the Study

This research holds significant theoretical implications for the integration of sustainability into project management and its impact on project success. It emphasizes the alignment of individual desires with organizational goals, as proposed by company behaviour theories, to enhance overall performance. The study's insights showcase the role of PMIS in translating sustainable project planning into tangible project outcomes,

contributing to the understanding of technology-enabled sustainability-focused project management solutions. The findings align with contingency theory, asserting that technical compatibility and organizational contingencies influence managerial effectiveness. The moderation effect of project manager satisfaction in the relationship between sustainable project planning and project success underscores the importance of individual attitudes, supporting stakeholder theory, which highlights stakeholder interests as key determinants of organizational performance. These theoretical implications elucidate the interconnectedness of sustainability, project management, and organizational outcomes, providing a foundation for further exploration and the development of more effective sustainable project management approaches.

This study holds significant implications for organizations striving for both project success and sustainability. The findings underscore the necessity of integrating sustainability considerations into project planning to enhance overall outcomes. Adopting sustainable project planning methodologies and technologies enables organizations to establish sustainability objectives, assess environmental and social impacts, and align project operations accordingly. Additionally, to bolster sustainable project management, the research advocates for investments in PMIS. PMIS facilitates enhanced communication, collaboration, and decision-making, contributing to improved project performance and the attainment of sustainability objectives. Given the pivotal role of project manager satisfaction as a mediator, creating a positive work environment and providing adequate support and resources become crucial. Acknowledging project managers' accomplishments, offering training and career advancement opportunities, and promoting transparency and teamwork contribute to their satisfaction. The practical implications underscore a comprehensive approach to sustainable project management, integrating sustainability principles, technology-enabled solutions, and organizational support mechanisms to enhance project outcomes while sustaining the environment, society, and the economy.

Limitations and Future Research Directions

This study offers insights into the connections among sustainable project planning, PMIS utilization, project manager well-being, and project success, but it

faces several limitations. The use of cross-sectional data from a specific sample restricts the generalizability of findings. Overcoming this limitation can be addressed through future longitudinal studies across diverse organizational contexts. These studies would enable exploration of temporal changes and assessment of interpersonal resilience. Additionally, the research focused on a limited set of variables, overlooking potentially significant factors. Future investigations should analyse business culture, leadership style, and stakeholder participation for a comprehensive assessment of project sustainability.

This study found strong correlations among sustainable project planning, PMIS adoption, project manager satisfaction, and project completion, yet the underlying processes remain unclear. Future research could employ qualitative methods like interviews and case studies to explore how sustainable project management influences project success. The study investigated the impact of PMIS and sustainable project planning on project success but overlooked intervening and moderating factors. Subsequent research may delve into the influence of organizational culture, innovation capabilities, and stakeholder engagement on sustainable project management and project success. The study did not consider contextual factors like project complexity, industry sector, and location, which future research could explore for broader applicability. Despite advancing sustainable project management literature, addressing these limitations and exploring new research avenues will contribute to the ongoing evolution of this critical discipline.

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Appendix 1

Sustainable Project Planning (10 items)

1. To what extent does your organization consider environmental sustainability factors during project planning?
2. How often are social responsibility considerations integrated into project planning processes?
3. To what extent are economic sustainability objectives prioritized in project planning?
4. How frequently are sustainable design principles incorporated into project planning activities?
5. Does your organization actively seek to minimize resource consumption and waste generation during project planning?
6. How often are stakeholders consulted and engaged in sustainable project planning initiatives?
7. To what extent does your organization consider long-term environmental impacts when developing project plans?
8. How frequently are sustainability performance metrics and indicators integrated into project planning processes?
9. Does your organization prioritize the use of renewable energy sources in project planning?
10. How often are sustainability goals and objectives aligned with project scope and objectives during planning phases?

Use of Project Management Information System (PMIS) (5 items):

1. How frequently do you utilize project management software to plan project activities?
2. To what extent do you rely on project management software for scheduling and resource allocation?
3. How often do you use project management software for task tracking and progress monitoring?
4. How frequently do you utilize project management software for communication and collaboration among project team members?

5. To what extent does project management software facilitate data analysis and decision-making processes during project execution?

Project Success (11 items):

1. To what extent were project objectives achieved within the specified timeframe?
2. How satisfied are you with the overall quality of deliverables produced during the project?
3. Were project costs within the budgetary constraints?
4. To what extent were project risks effectively managed throughout the project lifecycle?
5. How well did the project team collaborate and communicate during project execution?
6. Were project stakeholders satisfied with the project outcomes?
7. How effectively were project changes and deviations managed during project execution?
8. To what extent did the project meet or exceed client expectations?
9. Were project resources effectively allocated and utilized?
10. How satisfied are you with the overall performance of the project team?
11. How well were project scope and objectives aligned with organizational goals and priorities?

Project Manager Satisfaction with PMIS (5 items):

1. How satisfied are you with the usability and user interface of the project management software?
2. To what extent does project management software meet your specific project management needs and requirements?
3. How satisfied are you with the level of support and training provided for using project management software?
4. How effectively does project management software facilitate communication and collaboration among project team members?
5. To what extent do you believe project management software enhances your efficiency and productivity as a project manager?