

MINISTRY OF EDUCATION AND TRAINING
NATIONAL ECONOMICS UNIVERSITY

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**DEVELOPING A MODEL OF SUSTAINABLE-
ORIENTED FACTORS AFFECTING THE
PROJECT MANAGEMENT PROCESS OF
CONSTRUCTION PROJECTS IN VIETNAM**

Specialization: ECONOMICS (E-PHD)
Specialization code: 9310101

PHD DISSERTATION SUMMARY

HANOI - 2026

**THIS WORK WAS COMPLETED AT
NATIONAL ECONOMIC UNIVERSITY**

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**The dissertation defense at the university level
at the National Economics University
on of 2026**

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CHAPTER 1. INTRODUCTION

1.1. Research rationales

The construction industry, a significant contributor to economic growth, infrastructure, and employment, is simultaneously a major source of environmental degradation and social externalities. This dual role creates inherent tension between short-term efficiency and long-term sustainability. While previous research has extensively studied the sustainability of project outcomes (e.g., green buildings), far less attention has been given to how sustainability considerations are integrated within the actual project management processes (initiating, planning, executing, monitoring-controlling, and closing). This study addresses this critical gap by introducing "Sustainability-Oriented Factors Affecting the Project Management Process of Construction Projects." These factors, defined as managerial, organizational, institutional, and stakeholder-related elements, integrate economic, social, and environmental considerations across the entire project lifecycle, aligning with the Triple Bottom Line and process-based PM standards (ISO 21500, PMBOK). The research views sustainability not as an external constraint but as an integral orientation embedded within each PMP group, influencing decisions from objective definition to resource allocation and long-term value creation. This holistic, process-based approach is theoretically and empirically justified, as project performance issues often originate from early-stage decisions and propagate throughout the project lifecycle. The construction sector in Vietnam, characterized by rapid urbanization, infrastructure expansion, and policy commitments (Resolution No. 06-NQ/TW, 2022), provides a highly relevant context for this study, as existing research on sustainability-oriented construction remains limited and faces challenges such as weak coordination and insufficient guidance. By conceptualizing sustainability-oriented factors as embedded drivers within PMP across the entire project life cycle, this research directly responds to these gaps, offering implications for improving project performance and advancing long-term sustainable development in Vietnam.

1.2. Research objectives and questions

The overarching objective is to develop a model of sustainable-oriented factors affecting the PMP in Vietnamese construction. Seven specific objectives are outlined, including systematically identifying, classifying, and organizing factors into PMP phases; developing a conceptual research model; formulating hypotheses; empirically testing the model; analyzing relative importance and interaction effects; and proposing evidence-based recommendations. To achieve these, four research questions (RQs) are posed:

RQ1. What are sustainability-oriented factors in the project management process in the construction industry in the world? Which factors are suitable for the conditions of the Vietnamese construction industry?

RQ2. Whether or not sustainability-oriented factors identified can be grouped into five phases of the project management process in the Vietnamese construction industry?

RQ3. How can the impact level of sustainability-oriented factors be quantified (e.g., regression or cross-tabulation analysis)? Do the hypotheses regarding the influence of these factors on project management processes in the Vietnamese construction industry hold true?

RQ4. What are the latent relationships between sustainability-oriented factors in phases of project management processes to gain insights into the interrelationships among these factors in order to enhance project management processes in the Vietnamese construction industry?

RQ5. What are managerial recommendations to enhance the project management process in the Vietnamese construction industry?

1.3. Subject and scope of the research

The thesis focuses on construction projects in Vietnam, specifically apartment buildings, and their management processes. The study is conducted in Hanoi, focusing on projects by private enterprises with a scale of VND 200-500 billion. Primary data is collected through surveys and interviews with 15-20 individuals per business (investors, contractors, consultants), assessing factor impact levels. Secondary data from 2018-2024 informs the context and recommendations for 2024-2030, drawing from sources like the Ministry of Construction and the General Statistics Office.

1.4. Research methods

The thesis employs a quantitative research approach, exploring the research gap using a sustainability-oriented PMP framework. It leverages a mixed-method approach, starting with qualitative expert interviews for factor screening and context, followed by large-scale quantitative testing using PLS-SEM.

1.5. Contributions of the research

The dissertation offers significant contributions to both theory and practice.

- **Theoretical contributions:** It provides a comprehensive review of domestic and international research on sustainability-oriented PMP, addressing a novel and underexplored area in the Vietnamese context. It develops a robust research model with empirically tested hypotheses, classifying factors across PMP stages (initiating, planning, implementing, monitoring & control, closing) and exploring their interrelationships. It contributes to investment economics, construction economics, and SPM by conceptualizing projects as structured systems for value creation and embedding

sustainability directly into PMP groups, explicitly linking sustainability-oriented processes to investment efficiency.

- **Practical Contribution:** The research provides an evidence-based framework for investors, contractors, and project managers in Vietnam to implement sustainability-oriented practices, make informed strategic and operational decisions, align with global sustainability trends, and improve project quality and outcomes. It offers policy recommendations to enhance coordination among stakeholders and address shortcomings in current construction practices, supporting timely delivery and sustainable outcomes.

1.6. Structure of the dissertation

The dissertation is divided into five chapters: Chapter 1 (Introduction), Chapter 2 (Literature Review), Chapter 3 (Theoretical Framework and Research Methodology), Chapter 4 (Empirical Result and Discussion), and Chapter 5 (Conclusion and Policy Implication).

CHAPTER 2. LITERATURE REVIEW

2.1. Studies on sustainable development

This section defines sustainable development (SD) classically as "development that meets the needs of the present without compromising the ability of future generations" (WCED, 1987). In project management, SD aims to optimize People, Planet, and Prosperity, delivering long-term environmental, social, and economic value (Silvius & Schipper, 2014). It elaborates on the three core dimensions (environmental, economic, social) of the Triple Bottom Line (TBL), detailing their relevance to project management activities such as impact assessments, cost control, stakeholder engagement, and occupational safety. The chapter emphasizes that these three pillars are interconnected and essential for long-term success.

2.2. Studies on sustainable development in Construction industry and construction project management (SCPM)

This section examines the specific context of SD within the construction industry.

2.2.1. Construction Project and Project Management:

Defines construction projects as complex, multi-stakeholder endeavors with long lifecycles, high uncertainty, and significant environmental and social impacts. It categorizes projects into building, infrastructure, and industrial. Project management (PMI, 2021) is presented as an enabling system for sustainability performance, governing resource utilization, stakeholder interaction, and risk management. The Vietnamese context shows limited sustainability integration despite national regulations, highlighting the need for contextualizing global standards (ISO 21502:2020, PMBOK 7).

2.2.2. Sustainable Development in Construction Industry:

SD is an innovative concept in developing countries. Environmental indicators (waste, energy, water), economic (LCC, profitability), and social (safety, health) are key. Research is categorized into:

- *Group 1: General Perspective:* Synthesizes key research areas including materials, project management (stakeholder, waste, contract), sustainability assessment models, and energy. It notes a lack of quantitative methods for assessing sustainability and a focus on planning/implementation phases (Lima et al., 2021).
- *Group 2: Studies in Developing Countries:* Focuses on barriers (human resources, materials, technology, policy) and challenges in integrating sustainability, emphasizing stakeholder engagement and government support (Pham et al., 2019).
- *Group 3: Studies in Developed Countries:* Highlights established integration of sustainability, with a focus on Construction and Demolition Waste Management (CDWM) and regulatory influence (Aslam et al., 2020).

2.2.3. Sustainable development in construction project management:

Discusses the extensive literature on integrating sustainability into PM, conceptualizing it as incorporating social, environmental, and economic considerations across all PMP groups. Silvius and Schipper (2014) argue SPM extends traditional objectives to ethical responsibility, equity, resilience, and long-term value. SPM aligns with UN SDGs and emphasizes systematic integration across all construction stages.

2.3. Theoretical base of research models

This section constructs the multi-dimensional theoretical framework, synthesizing four interconnecting streams of thought:

2.3.1. Project Life Cycle Theory:

Provides the foundational temporal structure for project analysis (Initiating, Planning, Executing, Monitoring & Controlling, Closing) (PMI, 2017; APM, 2019). It discusses the "short-termism" bias (Morris, 2013) and the "sustainability gap" (Aarseth et al., 2017), where sustainability goals fail to translate across phases. The dissertation uses this theory to analyze where disconnects occur in Vietnam's construction reality.

2.3.2. Process-Based Management Theory:

Process-Based Management Theory posits that project management is the practical application of General Management Theory (GMT), rooted in Henri Fayol's foundational functions of planning, organizing, and controlling. The Project Management Process (PMP) serves as a specialized model that operationalizes these universal principles within the unique context of temporary, goal-oriented endeavors. Consequently, global standards like PMBOK and ISO 21500 are derived directly from this theoretical lineage, translating GMT's abstract tenets into concrete activities such as Initiating, Planning, and Executing. These process groups map explicitly to Fayol's original management functions, ensuring a rational and systematic approach to resource utilization. By institutionalizing these core principles, these standards establish PMP not merely as technical guidelines, but as rigorous tools for generating value and sustainable outcomes.

2.4. Studies on the Construction Management Process

This section elaborates on the PMP, defining it as structured activities to achieve objectives (ISO 21502, 2020). It discusses the compatibility of various PM standards and their evolution towards value-centered models (PMBOK 7, 2021). It highlights theoretical frameworks for integrating sustainability factors into PMP across phases (Opoku et al., 2024; Marcelino-Sádaba et al., 2015). Various integrated models (Varajão, 2018; Lima et al., 2021) and perspectives on identifying sustainability factors in project lifecycle stages (Spangenberg et al., 2010) are reviewed. Research on PMBOK application in Yemen (Gunduz et al., 2023) and interrelationships within process groups (Herrera et al., 2020; Zarei et al., 2017) are also discussed. The chapter concludes by noting that Vietnamese research has predominantly focused on specific knowledge areas rather than a comprehensive evaluation of PMP, creating a gap for holistic process evaluation.

2.5. Studies on sustainability-oriented factors influencing the Construction Project Management Process

This section provides a detailed breakdown of sustainability-oriented factors influencing PMP, categorized by each process group:

2.5.1. Initiating group attributes factors:

Discusses the critical foundation of the initiating phase despite its underexploration. Key factors include stakeholder engagement (Heldman, 2007; Bonge et al., 2024) and managerial capabilities (Guinan, 2024; Zhong et al., 2018), with the project charter being central. Gaps remain in addressing power imbalances and contextual factors.

2.5.2. Planning group attributes factors:

Emphasizes planning's role in establishing baselines and integrating sustainability. Factors include transparent procurement (Banihashemi et al., 2017b), material selection (Misnan et al., 2024), design safety (Shen et al., 2007), and compliance with ISO 14001/OHSAS 18001 standards (Asah-Kissiedu et al., 2021).

2.5.3. Implementing group attributes factors:

Focuses on executing project activities. Challenges include resource allocation, leadership, skills, and financial support (Aghaegbuna et al., 2020). Critical factors cover contractor selection, empowering personnel, managing capital (Zhong et al., 2018), team awareness of sustainability (Sang et al., 2018), and modern technology application (Banihashemi, 2017).

2.5.4. Controlling group attributes factors:

Deals with monitoring, measuring, and controlling performance against the plan (ISO, 2012). Highlights the importance of effective monitoring methods (Yong & Mustaffa, 2013) and the inclusion of social sustainability aspects like labor practices and fair working conditions (Stanitsas et al., 2021).

2.5.5. Closing group attributes factors:

Defines closure as formally establishing project completion and providing lessons learned (ISO, 2012). Discusses its strategic importance, stakeholder alignment, and factors like risk perception and contractual

finalization (Wen & Qiang, 2019). Social sustainability involves labor practices and community relations, with public acceptance being crucial. Documenting lessons learned is critical (PMBOK 2017).

2.5.6. Synthesis of sustainability - oriented factors and economic aspects within project management processes (PMP)

This section argues that PM is a field of applied economics, optimizing resource allocation under scarcity. PMP is the core instrument, with each phase inherently economic (Kerzner, 2017; Morris, 2013). The chapter includes a table (Table 2.2) summarizing specific factors and their economic/sustainable features across the PMP stages, from human resource selection and long-term efficiency in Initiating, to transparent bidding and effective procurement in Planning, and so forth, linking these factors directly to sustainable economic development.

2.6. Research gap

The dissertation identifies a significant research gap: while previous research extensively covered critical aspects like risk, cost, schedule, and quality, a comprehensive, process-oriented understanding of Construction Project Management Processes (CPMPs) themselves is lacking. This deficiency is pronounced in emerging economies like Vietnam. Existing research is largely "factor-centric" and often yields short-term recommendations. The study argues that enhancing CPMPs is fundamental for sustained improvement and that this research will fill the void by developing a holistic, process-driven framework for optimizing CPMP effectiveness in the Vietnamese construction industry.

CHAPTER 3. RESEARCH METHODOLOGIES

3.1. Research process

This study employs a mixed-method approach, starting with qualitative screening (in-depth expert interviews and Delphi method) to identify and validate relevant sustainability-oriented factors, followed by quantitative testing using PLS-SEM (Partial Least Squares Structural Equation Modeling). This systematic approach ensures both theoretical grounding and empirical validation.

3.2. Research model

3.2.1. Research model for stage 1:

Based on literature and expert interviews (9 senior leaders), a preliminary questionnaire was developed. Qualitative interviews refined measurement scales, assessed model suitability to Vietnamese context, and gathered insights on sustainability perceptions, consistency of sustainability requirements, experience with ISO/legal documents, and recommendations for sustainability integration. This stage refined the initial set of 40 sustainability-oriented factors.

3.2.2. Hypothesis of the research model of stage 1:

Sustainability-oriented factors are mapped to the five PMP groups (Initiating, Planning, Implementing, Controlling, Closing) based on PMBOK and ISO 21500. It is hypothesized that these factors, when sustainability-oriented, influence the effectiveness of the entire project management lifecycle (Chou & Yang, 2012).

3.2.3. Research model for stage 2:

This stage extends the scope by examining an interrelationship model between the five PMP groups themselves (Initiating, Planning, Implementing, Controlling, Closing), along with their effects on project management effectiveness. This aims to understand direct and indirect impacts.

3.2.4. Hypothesis of interrelationship between Project Management Process:

Hypotheses are developed to test the interrelationships, aligning with sequential PMP structures (PMBOK, ISO 21500). Specific hypotheses (H6-H14) explore how each process group (Initiating, Planning, Implementing, Controlling) influences subsequent groups and the Closing phase. For example, H6: Initiating has positive influence on Planning; H12: Initiating has positive influence on Controlling; H13: Initiating has positive influence on Implementing. H7: Planning has positive influence on Implementing, Controlling, Closing. H8: Implementing has positive on Controlling; H11: Implementing has positive influence on Closing. H9: Controlling has positive influence on Closing.

3.2.5. Operationalization of Key Variables and Hypotheses Framework:

Sustainability-oriented factors are operationalized as latent variables corresponding to each process group, using multiple indicators derived from ISO 21502, PMBOK 7, and prior empirical studies (Table 3.8).

3.3. Questionnaire Design

The questionnaire comprises two parts: demographics and factors influencing sustainability-oriented PMP. A five-point Likert scale (1=no influence, 5=very high influence) is used. The design involved three stages: expert consultation and pilot testing, reliability testing (Cronbach's Alpha) and EFA, and regression/PLS-SEM analysis.

3.4. Data collection

Data collection was executed in two stages:

Stage 1 - Secondary Data: Collected from GSO, Ministry of Construction, Ministry of Finance (Planning and Investment old) , and academic literature for contextual overview.

Stage 2 - Qualitative Research: In-depth interviews (two rounds) with 9 experienced experts and project management specialists, focusing on sustainability perceptions, consistency of sustainability requirements, their experiences, and recommendations for sustainable

project management. This phase identified the 40 sustainability-oriented factors initially.

3.5. Data analysis

The dissertation employs a rigorous data analysis procedure:

Descriptive Statistical Analysis: Characterizes the dataset and research sample, presenting frequencies, percentages, mean values, and standard deviations.

Factor Analysis (Reliability and Validity):

Reliability Testing (Cronbach's Alpha): Cronbach's Alpha values (0.799 to 0.911 for all groups) were all above the 0.70 threshold, confirming internal consistency. Items with Corrected Item-Total Correlation less than 0.3 or if Cronbach's Alpha increased upon deletion were removed (e.g., factor I1 "Human resource selection" was eliminated due to low CITC). The final set included 32 attributes.

Exploratory Factor Analysis (EFA): Applied Principal Component Analysis (PCA) with Promax rotation. Communalities > 0.5, KMO > 0.5 (0.798), and Bartlett's test (p=0.000) confirmed data suitability. Three attributes (I2 "Active participation of stakeholders," C7 "Troubleshooting, effective coordination of supervision," and C6 "Responsible labor practices for sustainable development") were eliminated due to low communalities or loading issues. The remaining 29 attributes formed the five sustainability-oriented sub-processes.

Regression Analysis (OLS) and PLS-SEM: Used to test hypotheses and interrelationships. PLS-SEM is particularly suitable for sustainability research due to its ability to handle abstract latent constructs and complex relationships. It also ensures measurement models (outer loading > 0.7, AVE > 0.5) and structural models meet criteria (HTMT < 0.85 for discriminant validity, SRMR < 0.08 for model fit).

CHAPTER 4. EMPIRICAL RESULT AND DISCUSSION

4.1. Project Management and Sustainable Construction in Vietnam

4.1.1. Research Context:

This subsection highlights Hanoi's strategic importance as a political, economic, and cultural hub in Vietnam, boasting a population of 10 million (2023) and contributing significantly to the national GDP (16.2% in 2023) with a GRDP exceeding VND 1,000 trillion. Hanoi serves as a growth engine for northern provinces, attracting human resources and investment, thus playing a vital role in the nation's sustainable development trajectory.

The Vietnamese government prioritizes investment in significant construction projects, recognizing the sector's role in socio-economic growth. The construction industry is projected to reach VND 695.6 trillion in 2024, with an average annual growth rate of 8.4% from 2024-2028. The Ministry of Construction is accelerating strategic infrastructure and housing projects, including the National Social Housing Program, with nearly 83% of planned units expected to be delivered by late 2025. The construction sector consistently contributes 6-7% to national GDP, reaching VND 641 trillion in 2023.

Crucially, alongside this rapid expansion, there is a growing recognition that sustainability must become integral to Vietnam's construction agenda. This includes aligning with environmental and social criteria, promoting green technologies (like BIM), sustainable supply chains, and international standards. This commitment is driven by rising energy costs, environmental awareness, and government initiatives, such as guidelines for green building certification and practical incentives. The adoption of sustainable features like insulation and smart building systems is increasing. Vietnam's national Sustainable Development Index (VNSI) reflects this growing attention, with 20 companies recognized for their contributions in 2020, including Cotecons.

The construction sector is dominated by Micro, Small, and Medium-sized Enterprises (MSMEs), accounting for approximately 98% of all firms nationwide. The number of active construction enterprises has consistently grown, with a majority focusing on residential building projects, and most firms maintain a dedicated project management board. This institutional structure underscores the relevance of developing a sustainability-oriented factor model for project management, although comprehensive statistics on enterprises actively pursuing SDGs are lacking.

4.1.2. Construction Project Management Practices in Vietnam:

This subsection critically examines the current state of Construction Project Management (CPM) practices in Vietnam. It notes the absence of a unified, legally binding document explicitly defining a standardized CPM process. Instead, project management is governed by a fragmented collection of various laws, regulations, and ministerial guidance, with each management aspect addressed through separate legal instruments.

While Vietnam did issue TCVN 11866:2017 (a national standard adapted from ISO 21500:2012) in 2017, its awareness and adoption, along with other international standards like PMBOK and ISO 21500, remain significantly limited among construction enterprises and professionals. In practice, project management tasks are largely executed based on individual experience, personal skills, habitual practices, or informal legacy guidelines. Many directors admitted unfamiliarity with ISO 21500 during interviews, even though they could still manage projects by breaking them down into work packages based on past project experiences. This heavy reliance on tacit knowledge and personal judgment often results in subjective decision-making, raising concerns about the objectivity and accuracy of project outcomes.

The section identifies a critical "Lack of Unified Understanding and the Need for Standardization." In-depth interviews revealed a consistent disparity between theoretical knowledge and practical

application, leading to inconsistent interpretations and implementations of PM concepts across projects. This underscores an urgent need for a unified standard to formalize Vietnamese PM practices and foster collaborative, team-based management structures. In companies without ISO certification, project management typically operates based on internal departmental roles and responsibilities, with Project Management Offices (PMOs) handling progress reporting and corrective actions, albeit often within informal structures.

4.1.3. Policies Related to Construction Project Management and Sustainable Development Orientation in Vietnam:

This subsection details Vietnam's robust policy commitment to sustainable development. It highlights the Prime Minister's Decision No. 622/QĐ-TTg, issued on May 10, 2017, which approved the National Action Plan for implementing the 2030 Agenda for Sustainable Development. This decision serves as the legal foundation for Vietnam's international commitments, aiming to promote balanced economic growth, social inclusion, and environmental protection. The Action Plan is also supported by strategic partnerships, notably with the German government, for implementing the 2030 Agenda and the Paris Agreement on Climate Change.

The Plan outlines an ambitious framework with 17 overarching goals and 115 specific targets for Vietnam, divided into two phases (2017-2020 and 2021-2030). It underscores sustainable development as essential for national progress, advocating for the harmonious integration of economic, social, and environmental dimensions, alongside proactive climate change response and national security. Key tasks for the current 2021-2030 implementation phase include mobilizing resources for SDGs, developing a comprehensive monitoring database, fostering high-quality human resources, and enhancing scientific research and technological innovation, particularly in environmental and clean energy solutions. This policy framework provides a strong top-down impetus for integrating sustainability into all sectors, including construction.

4.1.4. Forms of Construction Project Management Organization in Vietnam:

Governed by Construction Law (Article 62), options include Specialized/Regional PMUs, Single-Project Management Units, Project Management Consultancies, and Investor's Internal Management Units.

4.2. Management Orientation Perspective for Construction Projects Based on Sustainability factors in Vietnam in the Coming Period

This section details how Vietnam is working towards integrating sustainability.

4.2.1. Developing a Construction Project Management Process in Vietnam:

Discusses the current lack of a unified PMP tailored for construction, with focus on individual aspects. Emphasizes contextualizing ISO and PMBOK standards.

4.2.2. Developing Project Management Orientation to Ensure Sustainability Criteria:

The Construction Sector Development Strategy to 2030 (vision 2045) and the National Green Growth Strategy (2021-2030) underscore the government's commitment to guiding sustainable development in construction, targeting green urbanization and emission reduction.

4.2.3. Harmonizing the Relationship Between Project Management Process and Ensuring Stakeholder Participation and Coordination:

Multiple stakeholders (owners, consultants, contractors) are involved. Delegation to third-party consultancies is common for objectivity and specialization. Effective coordination enhances project performance and sustainability.

4.2.4. Comprehensively Addressing Shortcomings in the Project Management Process:

Challenges include legal inconsistencies, delays in approval, limited digital tools, low professionalism, corruption, and limited adoption of modern PM technologies, all hindering efficiency and transparency.

4.3. Evaluation of Sustainability-Oriented Factors Affecting Project Management Processes in the Vietnamese Construction Industry

4.3.1. Descriptive statistical analysis:

Based on 216 valid survey responses. Most respondents were project investors (55.6%) and highly experienced (>10 years: 66.7%). A significant portion (35.6%) was aware of sustainability concepts but had never applied them in practice. Similarly, 31.9% were aware of ISO 21500 but hadn't applied it. Projects were predominantly residential apartment buildings (47.7%), financed by private capital (66%), and mid-scale (VND 200-500 billion range).

4.3.2. Reliability test results of the measurement scales:

Cronbach's Alpha values for all five process groups (Initiating=0.799, Planning=0.911, Implementing=0.875, Controlling=0.869, Closing=0.843) exceeded the 0.7 threshold, confirming high reliability. Items with low Corrected Item-Total Correlation (e.g., I1) were removed.

4.3.3. Exploratory Factor Analysis (EFA) results:

EFA results (KMO=0.798, Bartlett's test $p=0.000$) confirmed data suitability. Five factor groups collectively explained 63.7% of variance. 29 sustainable-oriented attributes were retained after eliminating attributes with low communalities or loadings (I2, C7, C6).

4.3.4. Regression analysis results (stage 1):

The overall regression model was statistically significant (F-value $p=0.000$), explaining 55.9% of the variation in PMP effectiveness (R-square=0.559). All five PMP groups (Initiating, Planning, Implementing, Controlling, Closing) showed a positive and statistically significant influence on PMP effectiveness (all $p<0.005$). The order of impact from strongest to weakest was: Controlling ($\beta=0.279$), Closing ($\beta=0.18$), Implementing ($\beta=0.178$), Planning ($\beta=0.177$), and Initiating ($\beta=0.14$).

4.3.5. Result of PLS - SEM:

Evaluation of convergent validity (outer loading > 0.7, AVE > 0.5) and discriminant validity (HTMT < 0.85) was satisfactory after removing some items. Model fit (SRMR=0.082) was acceptable. R-square values for

dependent variables (e.g., Closing=0.443, Implementing=0.252) indicated moderate to above-moderate explanatory power.

4.3.6. Discussion of Research Model Results:

4.3.6.1. Discuss Results of the Impact of Factors on the Construction Project Management Process (Stage 1):

The analysis of project management processes in the Vietnamese construction industry reveals a distinct hierarchy of impact on project effectiveness, with the Controlling group exerting the strongest influence, followed by Closing, Implementing, Planning, and Initiating. The dominance of the Controlling phase underscores its critical role as a determinant of success, particularly in capital-intensive and risk-prone projects where rigorous monitoring, appropriate control methods, and financial readiness are essential for minimizing waste, ensuring compliance, and safeguarding economic sustainability. Conversely, the absence of robust control mechanisms often leads to "lock-in" decisions and systemic cost escalations. The Closing phase, identified as the second most impactful, is pivotal for formalizing completion and capturing long-term value through the resolution of issues with a lifecycle perspective, ensuring stakeholder coordination, and documenting lessons learned, which transforms project experience into organizational knowledge capital.

Regarding the Implementing phase, its effectiveness is heavily reliant on the outputs of planning and is characterized by the need for competent contractors, effective resource utilization, and a project team with a deep understanding of sustainability principles. Critical sustainability-oriented factors in this stage include the proactive mitigation of environmental impacts and robust construction waste management, which directly contribute to cost savings and social acceptance; however, the absence of foundational elements like modern technology can compromise these efforts. While Planning and Initiating show a comparatively lower impact in this specific context, they remain foundational; planning serves as the "center" of modern project management but cannot guarantee success without effective execution, and the often-overlooked initiation phase sets

the strategic trajectory. Ultimately, the findings suggest that project managers in Vietnam should leverage these insights to integrate sustainability into each specific process group—especially by enhancing control and closing mechanisms—to align with international standards like ISO and PMBOK for optimal project success.

4.3.6.2. Discuss Results of PLS- SEM Model (Stage 2):

The structural model analysis confirms that the majority of hypothesized interrelationships among project management process groups are statistically significant and positive, validating the general sequential framework where Initiating, Planning, Implementing, Controlling, and Closing phases are mutually reinforcing. However, a critical deviation is observed regarding the link between the Implementing and Controlling phases, which failed to achieve statistical significance; this suggests that in the practical context of Vietnamese construction, execution does not effectively drive control mechanisms, likely due to fragmented monitoring systems and a tendency toward concurrent rather than integrated management. Among the validated relationships, the influence of the Controlling process on the Closing phase emerged as the strongest, underscoring the vital importance of rigorous oversight and error rectification prior to formal completion to ensure project success and sustainability. The Initiating phase also demonstrated a powerful impact on Implementation, reinforcing the foundational role of early strategic alignment and project charters in guiding execution. Ultimately, while the results largely align with traditional theory regarding the importance of planning and initiation, the disconnect between implementation and control reveals a specific weakness in the Vietnamese sector, indicating that sustainability integration alters process dynamics and requires more robust feedback loops to be effective.

Qualitative insights explain the empirical disconnect between the implementing and controlling phases by highlighting systemic operational deficiencies within the Vietnamese construction industry. A primary impediment is the reliance on fragmented data collection and inadequate IT infrastructure, which results in delayed feedback loops and prevents real-

time adjustments to sustainable practices. This issue is compounded by a prevailing reactive management culture that prioritizes immediate cost and schedule targets over proactive sustainability monitoring, often treating environmental compliance as a secondary concern until critical incidents occur. Furthermore, organizational silos and a lack of transparent communication mechanisms create a barrier where monitoring data is not effectively relayed to implementation teams, hindering adaptive learning and continuous improvement. Ultimately, these factors cause the implementing and controlling processes to function in parallel rather than as a synergistic unit, confirming the lack of a significant relationship between them and exposing a critical gap in the effective integration of sustainability.

4.4. Existing Limitations in Construction Project Management Practices in Vietnam

This section identifies key limitations: inadequate long-term planning (superficial feasibility studies, frequent revisions), persistent weaknesses in cost management (overruns due to poor control, outdated pricing), frequent project delays (land clearance, funding, contractor capacity, weak monitoring), problematic tendering processes (prioritizing lowest bid), low professionalism, corruption, and limited adoption of modern PM technology (BIM, PMIS, ERP)

CHAPTER 5. CONCLUSIONS AND MANAGERIAL IMPLICATIONS

5.1. Conclusion

5.1.1. Conclusion relating to Construction Project Management Process in Vietnam:

The thesis provides insights into CPMP in Vietnam within the sustainability context. It challenges traditional assumptions (PMBOK/ISO) by finding that Controlling and Closing phases have a significantly stronger influence on PMP efficiency in Vietnam than the traditionally prioritized Planning phase. This reflects Vietnam's context of regulatory inconsistencies, resource constraints, and reliance on individual experience. The study also confirms the limited practical application of ISO standards (TCVN 11866:2017) due to low awareness and lack of mandatory requirements.

5.1.2. Conclusion relating to the aspects of economics:

This thesis provides a comprehensive analysis of economic aspects, conceptualizing construction projects as systems for transforming investment capital into economic, social, and environmental value. It highlights the outstanding economic contribution of the Controlling and Closing phases in Vietnam, demonstrating their role as strategic mechanisms for protecting and maximizing investment value through waste minimization, resource optimization, and knowledge capital creation. Sustainability-oriented elements are thus a decisive factor in investment efficiency and long-term economic value creation.

5.1.3. Conclusions relating to the sustainability of construction projects in Vietnam:

The study asserts that sustainability is a core determinant of project success, contextualizing SPM theory for Vietnamese practice. It clarifies that sustainability factors are urgent requirements for improving

investment efficiency and long-term value, aligning with national commitments (Resolution 06-NQ/TW, COP26). It demonstrates sustainability through three pillars:

- *Economic sustainability:* Optimizing LCC, minimizing resource waste, enhancing financial resilience.
- *Social Sustainability:* Effective HR management, stakeholder engagement, transparent communication (workplace safety, fair conditions, community acceptance) for "Social License to Operate."
- *Environmental Sustainability:* Modern technologies (BIM), waste management, proactive environmental assessment for reducing impacts and carbon emissions. The thesis concludes that a shift in mindset is needed, viewing sustainability as an integrated strategy at each CPMP stage, aiming for comprehensive value creation.

5.2. Managerial implication of finding

5.2.1. Managerial implications of findings in terms of construction projects in Vietnam:

The key challenge is not the absence of legal provisions, but weak enforcement and lack of binding requirements for international standards. Existing requirements (EIA, social impact, bidding transparency) remain formalistic. Recommendations include:

5.2.1.1. Enhancing financial capacity and capital efficiency through mandatory lifecycle-oriented control:

Amend existing decrees to mandate LCC and Value Engineering in planning/controlling, shifting focus to Total Cost of Ownership (TCO). Require digital project control systems (BIM, IoT) for real-time monitoring.

5.2.1.2. Institutionalizing organizational learning and human capital through standardized project management frameworks:

Require formalized lessons-learned systems (templates, knowledge repositories) and minimum competency requirements for PMs (ISO/PMBOK principles).

5.2.1.3. Strengthening enforcement mechanisms to create a fair and sustainable investment environment:

Strengthen electronic bidding platforms, data disclosure, and compliance audits. Embed stakeholder coordination requirements into regulations.

5.2.2. Managerial implications of findings in terms of the aspects of economics:

5.2.2.1. Re-envisioning Investment Efficiency through Dynamic Control and Lifecycle Value:

Emphasizes the paramount importance of the Controlling phase. Recommends Proactive LCC Integration from earliest stages and implementation of Advanced, Sustainability-Oriented Control Systems (SPIs, BIM, IoT) for continuous monitoring and deviation rectification.

5.2.2.2. Cultivating Knowledge Capital and Strategic Organizational Learning for Future Prosperity:

Highlights the Closing phase as critical. Recommends institutionalizing Robust Lessons Learned Systems and investing in Project Management Human Capital (leadership, sustainability mindset, professional development).

5.2.2.3. Fostering Market Efficiency and Responsible Investment Climate:

Advocates for Transparent and Competitive Procurement Processes and Proactive Stakeholder Alignment and Governance to optimize public fund utilization and secure "social license to operate."

Academic Contributions:

The study makes significant theoretical and empirical contributions by contextualizing PM theory in an emerging economy (Vietnam), extending global frameworks (ISO 21500, PMBOK) for local relevance (Controlling and Closing play disproportionately significant roles), and integrating sustainability principles into process-based PM (TBL).

Key Findings and Novel Insights:

These include the reevaluation of process group significance (Controlling and Closing > Planning), emphasizing Integrated Process Interactions, and aligning with National Sustainability Agendas.

Practical Implications for Industry Stakeholders:

Provides a blueprint for implementing sustainability-oriented practices, leveraging digital transformation, stakeholder participation, and regulatory alignment.

Research Limitations:

The study acknowledges limitations including geographical concentration (Hanoi), focus on mid-scale projects (VND 200-500 billion), primary focus on contractors (not other stakeholders), concentration on five PMP groups, and data constraints.

Future research:

Recommendations include broadening geographical/sectoral scope, diversifying stakeholder base, exploring emerging technologies (BIM, AI, IoT), and cross-national comparative studies.

REFERENCES

**LIST OF WORKS RELATED TO THE DISSERTATION
THAT THE PHD CANDIDATE HAS PUBLISHED**

1. Dinh, D. T., Ho, B. D., Luu, V. T., & Dang, A. T. (2025), “Structural equation model of sustainable oriented attributes influencing the project management process and strategy of construction projects”, *Corporate & Business Strategy Review*, 6(3), 74–87.
2. Dinh, D. T., Ho, B. D., Luu, V. T. (2025), ‘Sustainability oriented factors influent on project management process of construction industry in Viet Nam’, *Review of Finance*, Volume 07, Issue 2.
3. Dinh, D. T., Ho, B. D., Luu, V. T. (2025), ‘Critical factors affecting the project management process of construction projects in Vietnam from different viewpoints of stakeholders’, *Proceeding on Lecture Notes in Civil Engineering*.