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Project Performance Assessment of Capital Outlay Infrastructure Projects in A Higher Education Institution in Catanduanes, Philippines

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Abstract

This study evaluates the performance of capital outlay infrastructure projects at a government higher education institution in Catanduanes, Philippines, with a focus on cost and time efficiency. Using a qualitative research approach, it integrates project metrics, stakeholder interviews, and focus group discussions to identify key challenges and propose strategic interventions. Findings reveal persistent budget overruns and project delays due to inefficiencies in resource allocation, inadequate monitoring mechanisms, and deficiencies in quality assurance protocols. To address these challenges, the study highlights the potential of an Earned Value Management (EVM) framework to enhance project accountability, streamline coordination, and improve decision-making processes. Recommended interventions include the establishment of standardized project management protocols, refinement of contractor selection criteria, and targeted capacity-building initiatives to bridge skills gaps. By integrating these strategies, the study aims to optimize project performance and align infrastructure development with institutional objectives. The research underscores the critical role of systematic project management and robust monitoring frameworks in enhancing infrastructure delivery within higher education institutions. Its findings provide a foundation for policy recommendations and broader applications of EVM in public sector infrastructure projects, with future studies encouraged to explore cross-sectoral EVM implementations to improve efficiency, transparency, and sustainability in project execution.

Keywords: Earned Value Management (EVM), Performance Measurement Tool, Project Performance, GAA-Infrastructure Projects, Higher Education Institutions, State Universities and Colleges, Capital Outlay

INTRODUCTION

The construction industry is a key driver of economic and infrastructural growth, significantly contributing to national development through job creation, revenue generation, and modernization (Alaloul et al., 2022). Globally, the industry is expected to expand from $6.4 trillion in 2020 to $14.4 trillion by 2030 (Global Construction Market Size 2030, n.d.). However, in the Philippines, this growth faces challenges, with a revised industry growth forecast of 13.4% for 2022 due to rising material costs, labor shortages, and inefficient project management (Philippines Construction Industry Report 2022, 2023). Despite government investments in infrastructure, the sector's GDP contribution has fluctuated, dropping from PHP 410,454 million in late 2022 to PHP 280,399 million in early 2023 (Philippines GDP From Construction - 2023 Data - 2024 Forecast - 2000-2022 Historical, n.d.).

A major issue in Philippine construction is project performance, particularly in public infrastructure projects, which often suffer from cost overruns, delays, and quality concerns due to poor project management (Haron et al., 2017). Addressing these inefficiencies requires structured methodologies that optimize cost, time, and quality, ensuring effective resource allocation, risk management, and stakeholder coordination.

Within higher education institutions (HEIs), infrastructure development is essential for

enhancing learning environments, expanding research capacity, and supporting institutional growth. In the Philippines, these projects are primarily funded through the General Appropriations Act (GAA) under the Capital Outlay (CO) component, along with provisions for Personal Services (PS) and Maintenance and Other Operating Expenses (MOOE). In the government HEI located in the Catanduanes, rising student enrollment—from 7,211 in 2018 to 13,200 in 2022—created a pressing demand for expanded facilities. Over this period, the institution received approximately PHP 660.46 million in capital outlay, supporting 26 major infrastructure projects. These included the construction of academic buildings, research facilities, and road networks to accommodate institutional expansion and improve service delivery.

This study evaluates the performance of capital outlay infrastructure projects in a government HEI in Catanduanes, Philippines, assessing their efficiency in achieving institutional and national development goals. Using Earned Value Management (EVM), a project performance measurement tool, the research quantifies cost and schedule efficiency by comparing planned versus actual performance (Proaño-Narváez et al., 2022). While widely applied globally, EVM remains underutilized in Philippine HEI infrastructure projects. To complement EVM analysis, semi-structured interviews provide qualitative insights into project execution challenges.

By integrating qualitative approaches, this study identifies areas for improvement in HEI project management, contributing to a more efficient and sustainable framework for infrastructure development. The findings offer empirical evidence to guide policy decisions, ensuring HEI infrastructure investments align with educational and economic objectives.

LITERATURES

Technological Trends in Construction Project Management. In response to evolving global demands, the field of construction project management has seen a transition toward digital tools and innovative methodologies. Emerging trends includes the use of Earned Value Management (EVM) offering real-time insights into scope, schedule, and budget adherence (Project Management Institute | PMI, n.d.), and the adoption of agile project management frameworks (Chathuranga et al., 2023; Harrison & Lock, 2017). These tools offer enhanced accuracy in forecasting, scheduling, and cost control, representing significant improvements over traditional management practices.

Earned Value Management (EVM). Earned Value Management (EVM) serves as a vital project management tool that integrates scope, schedule, and cost to assess project performance and forecast future outcomes. Its advantages include enhanced monitoring and tracking of project progress, enabling project managers to identify deviations early and make informed decisions, thereby improving overall project profitability and efficiency (Efe & Demirors, 2013; Salunkhe & Changade, 2021). EVM's application spans various industries, including construction and software, where it helps manage complexities and uncertainties inherent in projects (Salunkhe & Changade, 2021). However, challenges such as resistance to adoption, the need for accurate data, and the complexity of implementation can hinder its effectiveness (Efe & Demirors, 2013; Li, 2023). Despite these challenges, EVM's ability to provide real-time insights into project performance and profitability makes it a valuable asset for project managers aiming to optimize resource allocation and achieve project goals (Setyopurnomo et al., 2025).

EVM Metrics. The evaluation of project performance through metrics such as Planned Value (PV), Actual Cost (AC), and Earned Value (EV) is essential for assessing cost efficiency and schedule adherence. When EV is less than PV, it indicates that the project is behind schedule. Conversely, if EV meets or exceeds PV, the project is on or ahead of schedule (Jasim et al., 2024). Cost performance is similarly evaluated by comparing AC to EV; exceeding EV indicates budget overruns, while being under EV suggests cost efficiency

(Oktrianto & Susetyo, 2020). Projects facing delays may require resource reallocation or scope adjustments, while those over budget necessitate expenditure reviews to enhance efficiency (Salsabila et al., 2024). Thus, effective use of Earned Value Management (EVM) can significantly aid in maintaining project timelines and budgets (Ramasamy, 2010).

Challenges in Cost and Time Efficiency. The disconnect between financial planning and project scoping is influenced by several key factors, including organizational structure, budgeting processes, stakeholder engagement, and technological tools. Organizational structures often lack the flexibility to integrate agile project management with traditional budgeting models, leading to misalignment between financial planning and project execution. This is particularly evident when agile methodologies, which require rapid adaptation, clash with slower, classical budgeting models like rolling budgets and forecasting, creating a gap in governance processes (Ploder et al., 2020). Budgeting processes themselves can be rigid, failing to accommodate the dynamic nature of project scoping, especially in environments where scope creep is prevalent due to inadequate initial scoping and stakeholder misalignment (Cleveland & Cleveland, 2023). Stakeholder engagement is another critical factor; inconsistent stakeholder identification and engagement practices can lead to miscommunication and unmet expectations, further exacerbating the disconnect between planning and execution (Mojidra et al., 2024; Watkins & Denney, 2023). Effective stakeholder management, which includes early identification and continuous engagement, is essential for aligning project goals with financial plans (Ametepey et al., 2023; May Equitozia Eyeregba et al., 2024). Technological tools can bridge these gaps by enhancing communication, improving resource allocation, and providing real-time data for decision-making. To address these issues, organizations should adopt integrated frameworks that combine agile methodologies with traditional budgeting, enhance stakeholder engagement through structured management strategies, and leverage advanced technological tools to ensure alignment between financial planning and project scoping (May Equitozia Eyeregba et al., 2024; Ploder et al., 2020).

METHODS

Research Design. This study employed a descriptive qualitative research design to provide an in-depth analysis of the performance of government-funded infrastructure projects at higher education institutions (HEIs) in Catanduanes. A phenomenological approach was adopted to explore the lived experiences, perceptions, and challenges encountered by key stakeholders involved in project implementation and monitoring. Data were collected through documentary analysis, semi-structured interviews, and focus group discussions (FGDs) to capture a comprehensive understanding of the participants' perspectives.

Descriptive research is widely recognized for its ability to systematically and accurately depict a phenomenon (Usman, 2020). It serves as a foundation for empirical investigations by providing a factual representation of the subject under study. This methodological approach is particularly suitable for investigating the efficiency, effectiveness, and sustainability of infrastructure projects within HEIs. According to Lim (2024), descriptive qualitative research allows researchers to explore "lived experiences" within a specific context, thereby offering deeper insights into the underlying factors shaping project performance. Baxter and Jack (2015) further emphasize that qualitative research enables the contextualization of phenomena, ensuring a comprehensive understanding of their broader implications.

Research Locale. This study was conducted at a government higher education institution located in the Province of Catanduanes, Philippines. As the sole public HEI in the province, the institution plays a vital role in delivering higher education, conducting research, and supporting community development initiatives across the region. The university operates multiple campuses, with two primary sites—one located

in the provincial capital and another in a northern municipality—serving as the main locations for the infrastructure projects examined in this study. These campuses were selected due to the scale and scope of GAA-funded infrastructure developments implemented within their premises.

Data Sources and Participants. Performance measurement data for GAA-funded infrastructure projects (FY 2018–2022) were obtained from the Project Management Office (PMO), Planning and Development Services (PDS), and Project Monitoring Committee (PMC). Key documents analyzed included quarterly financial and physical reports, progress reports, and abstract sheets. Earned Value Analysis (EVA) was applied to assess Planned Value (PV), Actual Cost (AC), and Earned Value (EV), while Cost Performance Index (CPI) and Schedule Performance Index (SPI) were computed to evaluate project efficiency.

Using purposive sampling, six (6) respondents directly involved in project management were selected from the PMO, PDS, and PMC. These participants, possessing extensive expertise in infrastructure project management, provided qualitative insights through semi-structured interviews and focus group discussions (FGDs). Importantly, the selection of six participants aligns with established qualitative research standards. As emphasized by Young and Casey (2018), a sample size of as few as 4 to 10 participants can be sufficient for identifying themes and codes, particularly in focused qualitative inquiries. Such small samples are generally considered adequate for thematic analysis, as they allow for in-depth exploration while capturing a diversity of perspectives.

Data Collection Method. Data were collected using documentary analysis, semi-structured interviews, and focus group discussions (FGDs). The first phase, documentary analysis, examined archival records from FY 2018–2022 sourced from the Project Management Office (PMO), Planning and Development Services (PDS), and the Project Monitoring Committee (PMC), including progress reports, financial records, and contract documents. Earned Value Analysis (EVA) was applied to assess project performance indicators such as Planned Value (PV), Actual Cost (AC), and Earned Value (EV), while Cost Performance Index (CPI) and Schedule Performance Index (SPI) were computed to evaluate cost efficiency and schedule adherence. The second phase, semi-structured interviews, engaged participants to gather insights into project challenges and best practices. Subsequently, the third phase involved an FGD with the same respondents, facilitated an interactive discussion on project oversight, guided by the FGD protocol.

Research Instrument. The individual interview guide was designed to gather detailed insights from personnel directly involved in the implementation of GAA-funded infrastructure projects. Questions were developed with focus on cost and time efficiency. Respondents were asked to describe how resources—such as budget, manpower, and materials—were allocated and evaluated for efficiency. They were also encouraged to share their experiences with project timelines, including common causes of delay and the methods used to mitigate them. Some questions explored how standards were defined and maintained, and how trade-offs between quality, cost, and time were managed. These open-ended questions aimed to generate rich, experience-based narratives that reflect the realities of project management within the institution.

In addition, the FGD guide facilitated discussion on institutional-level project management practices, current monitoring methods, and opportunities for improvement. Participants were prompted to reflect on the strengths and weaknesses of existing systems, as well as any recurring issues that hindered project success. Sample questions explored how efficiency could be enhanced within current operational frameworks and what specific challenges needed to be addressed to improve project performance. The potential value of adopting EVM as a monitoring tool was also discussed, particularly in relation to tracking cost, schedule, and quality performance. Thus, the combination of documentary analysis, individual interviews, and group discussions

provided a well-rounded understanding of project performance and monitoring practices at the selected institution, yielding valuable insights for performance assessment.

Data Analysis. The study employed Colaizzi's (1978) method of phenomenological data analysis. This is a systematic approach that facilitates the extraction of thematic insights from qualitative data (Sanders, 2003; Abu Shosha, 2012). The researchers identified multiple themes that encapsulated the essence of participants' narratives, demonstrating the method's effectiveness in revealing deep insights into complex human experiences. This approach involves a systematic process to derive thematic insights from qualitative data. First, all transcripts were read thoroughly to gain a general understanding of the participants' experiences. Significant statements relevant to the phenomenon were then extracted, from which meanings were formulated. These meanings were organized into categories, clustered into themes, and integrated to form a comprehensive description of the phenomenon. Finally, the exhaustive description was then distilled into its fundamental structure, capturing the essence of the lived experience.

Ethical Considerations. This study adhered to strict ethical guidelines to ensure participant rights, confidentiality, and transparency. Informed consent was obtained from all respondents in semi-structured interviews and focus group discussions (FGDs) after they were briefed on the study's objectives, risks, and benefits. Confidentiality and anonymity were maintained by anonymizing responses and withholding participant identities in published materials. Ethical integrity was upheld through transparent communication and the avoidance of conflicts of interest, ensuring fairness and respect for all participants. Additionally, participants were encouraged to uphold ethical project management practices, fostering openness, integrity, and accountability. These measures align with international research ethics standards, ensuring the study's credibility and reliability.

RESULTS

Project Overview. This study examined twenty-six (26) locally funded infrastructure projects implemented from Fiscal Years (FY) 2018 to 2022 under the General Appropriations Act (GAA) in an HEI in Catanduanes. The total allocated budget for these projects was Php 660,464,000.00, while the contracted amount was Php 580,031,026.15. These projects were distributed across the fiscal years as follows: three (3) projects in 2018, eleven (11) projects in 2019, eight (8) projects in 2020, three (3) projects in 2021, and one (1) project in 2022.

In terms of completion status, cost and time performance revealed significant discrepancies between the approved and actual project durations, as well as cost overruns. The study categorized project statuses into four main classifications. The majority of the projects, 17 of 26 (65%) fell under the category of "Completed, Contract Lapsed," meaning they were finished but exceeded the approved contract duration. Another, 5 of 26 (19%) of the projects were "Contract Terminated," indicating that these were discontinued before completion. Meanwhile, 2 of 26 (8%) of the projects were "Completed, On-Time," signifying they were finished within or very close to the approved duration. Lastly, 2 of (26) 8% of the projects were classified as "Not Completed, Funds Reverted," which meant the projects remained unfinished, and the allocated funds were returned. Figure 1 highlights the overall distribution of project statuses, indicating that contract lapses and terminations were prevalent challenges in project execution.

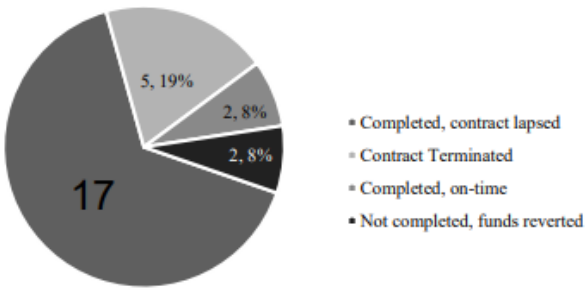

Figure 1
Project Status Summary of Infrastructure Projects (2018-2022)

Summary of Performance Measurement Data. The basic performance measurement data are critical in evaluating the projects' cost efficiency and schedule performance. These metrics include the PV, AC, and EV.

The relationship between EV and PV determines whether a project is on track in terms of schedule. If EV is less than PV, the project is behind schedule because the value of work completed is less than planned, indicating delays in progress. Conversely, if EV is greater than or equal to PV, the project is either on or ahead of schedule, meaning the work accomplished meets or exceeds planned expectations. Similarly, cost performance is assessed by comparing AC to EV. If AC exceeds EV, the project is over budget, reflecting inefficiency in cost management or potential overspending. On the other hand, if AC is less than EV, the project is under budget, indicating cost efficiency or savings.

Out of the 26 projects analyzed, 17 (65%) had an Actual Cost (AC) that exceeded their Earned Value (EV), indicating that these projects were over budget. Additionally, the Earned Value (EV) for 20 out of 26 projects (77%) was lower than their Planned Value (PV), suggesting delays in project execution. These findings highlight both budget overruns and scheduling issues, emphasizing the need for better cost control and project management strategies.

Project Performance Index (SPI and CPI). CPI measures cost efficiency by calculating the ratio of Earned Value (EV) to Actual Cost (AC). A CPI greater than 1 indicates the project is under budget, while a CPI less than 1 signifies cost overruns. SPI assesses schedule adherence by comparing EV to Planned Value (PV). An SPI greater than 1 suggests the project is ahead of schedule, whereas an SPI less than 1 indicates delays (PMTI, 2022).

The performance of the twenty-six (26) infrastructure projects under study was based on two critical performance these indices which are essential to project monitoring and management indicators to assess cost efficiency and schedule adherence. The CPI and SPI values analysis across these projects highlights a clear interrelationship between cost and schedule performance. Figure 2 illustrates the relationship between SPI and CPI values for the infrastructure projects under study, highlighting varying cost and schedule performances. The data shows that many projects cluster around a CPI and SPI value of 1.0, indicating performance close to planned cost and schedule. The 26 projects are categorized into four groups: (1) over budget and behind schedule (CPI < 1, SPI < 1), (2) under budget but behind schedule (CPI ≥ 1, SPI < 1), (3) over budget but ahead of schedule (CPI < 1, SPI ≥ 1), and (4) under budget and ahead of schedule (CPI ≥ 1, SPI ≥ 1).

The analysis of 26 infrastructure projects highlights key performance trends based on CPI and SPI values as shown in Figure 2. Half of the projects, 13 of 26 (50%) were over budget and behind schedule (CPI < 1, SPI < 1). Meanwhile, 5 of 26 (19.24%) projects were under budget but behind schedule (CPI ≥ 1, SPI < 1). In contrast, 4 of 26 (15.38%) projects were over budget yet ahead of schedule (CPI < 1, SPI ≥ 1). Lastly, 4 of 26 (15.38%) projects successfully remained under budget and ahead of schedule (CPI ≥ 1, SPI ≥ 1).

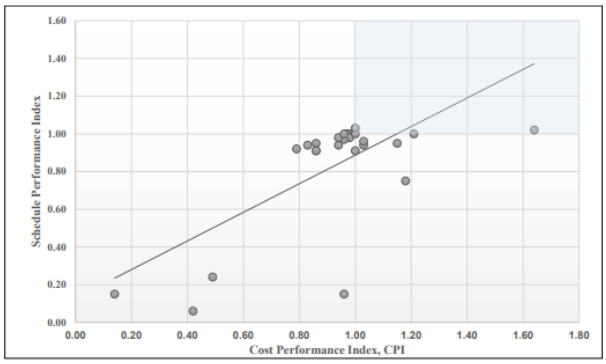

Figure 2
Cost Performance Index (CPI) and Schedule Performance Index (SPI) Relationship (2018-2022)

Factors Affecting Project Performance. The qualitative data from interviews and focus group discussions (FGDs) with key project management personnel involved in the planning, implementation, and monitoring of GAA-funded projects were analyzed using Colaizzi's phenomenological method. This

analysis identified recurring themes and categories that provide deeper insights into factors affecting project performance. The findings are categorized into four themes: 1) challenges in resource allocation and utilization efficiency, 2) factors influencing the timely completion, 3) root cause of quality challenges, and 4) Project Management Improvement Insights.

Challenges in resource allocation and utilization efficiency. From the interviews conducted, respondents consistently pointed out several issues that affect resource allocation and utilization efficiency in GAA-funded infrastructure projects. Participants observed a misalignment between the timing of fund releases and the completion of project planning, noting that funds are often released prematurely, requiring revisions to initial plans just to meet budgetary constraints, which disrupts the flow of implementation. Interviewees also expressed concerns about the current monitoring mechanisms, describing them as insufficient in detecting real-time inefficiencies, which often leads to unnoticed deviations and project delays.

Material management challenges were also commonly cited, particularly poor storage practices and inadequate inventory control. Respondents shared that materials like reinforcing steel bars were frequently stored under suboptimal conditions, resulting in deterioration and added costs. Labor productivity was another recurring concern, with participants explaining that labor allocation is usually driven by available budget rather than actual project needs, leading to uneven workloads and inefficiencies. Several respondents further highlighted noticeable gaps in knowledge and technical skills among engineers, contractors, and committee members, suggesting that these gaps contribute to execution errors and rework. Lastly, interviewees noted the absence of standardized procedures and clear role definitions, attributing this to miscommunication and inefficiencies, and recommended aligning with national guidelines such as those provided by the DPWH.

Factors influencing the timely completion. Project delays emerged as a common issue among respondents, often triggered by inclement weather and logistical inefficiencies, particularly delays in the delivery of materials due to contractors opting for cost-saving but slower transportation methods. Respondents also stressed the importance of strict monitoring of manpower and materials, and they required contractors to submit advanced schedules to anticipate and prevent procurement-related delays. Another key point raised was the importance of accurately forecasting material needs and clearly defining project milestones to maintain progress and avoid interruptions.

Root cause of quality challenges. A major concern voiced by respondents was the lack of a dedicated QA/QC (Quality Assurance/Quality Control) office or team. Without formal oversight, quality control became inconsistent, increasing the likelihood of defects. There was also a shortage of expertise in specific technical domains, especially in MEPF (mechanical, electrical, plumbing, and fire protection) systems. As a result, some crucial tests and procedures were either inadequately defined or completely omitted from the Scope of Work. Moreover, participants pointed out that weaknesses in procurement and planning strategies were contributing to subpar quality outcomes. The absence of a Project Management Plan (PMP) also created execution inconsistencies, particularly when project personnel changed midstream.

Project Management Improvement Insights. Respondents emphasized the lack of standardized and systematized project management processes. They described unclear work instructions, poor coordination with contractors, and unnecessary redundancy in administrative tasks. The absence of a clear project measurement system made it difficult to track actual accomplishments. There was also a strong push from respondents to adopt a more proactive and predictive project management style. They suggested empowering site engineers to make immediate decisions as issues arise on-site. Moreover,

participants called for hiring specialized personnel and introducing rigorous procedures such as material submittals and pre-construction documentation. Finally, respondents expressed a strong need for a centralized Project Management Office (PMO) to coordinate all phases of the project, assign clear departmental responsibilities, and monitor performance from design through completion.

DISCUSSION

The uneven distribution of projects across fiscal years—with a peak in 2019—suggests a strategic push for infrastructure expansion, potentially driven by increased funding or shifting institutional priorities. However, the low number of on-time completions highlights persistent project management challenges, with numerous projects classified as "Completed, Contract Lapsed" or "Contract Terminated," indicating difficulties in adhering to timelines. These delays may stem from procurement issues, contractor performance problems, or unforeseen disruptions. Projects with reverted funds represent missed development opportunities, particularly in an educational institution striving to enhance its infrastructure for academic advancement. Taken together, these issues underline the pressing need for stronger oversight and improved planning mechanisms to mitigate delays and maximize fund utilization.

Cost management inefficiencies are also prevalent, as evidenced by the performance of many projects where Earned Value (EV) falls below Planned Value (PV), indicating schedule delays, and Actual Cost (AC) exceeds EV, reflecting overspending. This dual challenge of cost and schedule performance further exposes weaknesses in project control systems. The simultaneous occurrence of both cost overruns and schedule delays in many project points to inadequate planning, ineffective resource allocation, and delayed decision-making. Projects under budget but behind schedule likely suffered from procurement bottlenecks or external factors, such as extreme weather, while those over budget but ahead of schedule likely used expedited methods, such as fast-tracking, which increased costs. Notably, the few projects that were completed on time, under budget, and ahead of schedule suggest the benefits of effective stakeholder engagement, clear project scope, and strong risk management practices. These variations emphasize that managing cost and time effectively requires a balanced, disciplined approach.

The observed disconnect between financial planning and project scoping mirrors findings by Shah et al. (2023), who argue that misaligned funding cycles trigger costly revisions and delays. To address these issues, it is essential to strengthen both the financial and operational frameworks. The inadequacy of the monitoring and evaluation system aligns with Inisha and Elly (2022), who suggest that weak monitoring structures hinder timely decision-making. Poor material handling and labor imbalances, driven by budget constraints, further contribute to inefficiencies, as discussed by Yıldız et al. (2024) and Chaturvedi et al. (2018). Additionally, gaps in stakeholder knowledge and the lack of standardized procedures undermine communication and efficiency, as noted by Majstorović and Jajac (2023). These factors underscore the need for a holistic approach to project management, addressing both technical and procedural shortcomings.

The delays attributed to weather and logistics echo Schuldt et al. (2021), who found that weather-related setbacks are common in global construction projects, often resulting in financial losses. To mitigate such challenges, early detection and proactive planning are crucial. The emphasis on strict monitoring supports best practices promoted by the Project Management Institute (PMI), which highlights the value of real-time tracking for timely project completion. Accurate forecasting and milestone setting are essential, as emphasized by Vaseghi and Vanhoucke (2023), in proactively managing resources and addressing issues early.

These findings point to systemic gaps in project oversight and planning. To address these

systemic gaps, a more structured governance model is necessary. The absence of a Project Management Plan (PMP) and quality control frameworks, as well as deficiencies in procurement and material quality management, underscore the need for formalized processes, as advocated by Mehta (2024) and Salvi et al. (2020). The lack of specialized expertise, particularly in areas like MEPF, further calls for ongoing professional development and training (Lavikka et al., 2020). Lastly, the push for a centralized Project Management Office (PMO) resonates with Monteiro et al. (2016), who argue that centralized oversight improves communication, coordination, and accountability throughout the project lifecycle.

Proposed Policy Formulation Framework. The study identified a diverse range of challenges and opportunities within the domain of project implementation. These insights shed light on critical gaps that need to be addressed for better project outcomes. These themes highlight areas requiring targeted interventions to ensure the success and sustainability of capital outlay projects. In response to these identified challenges, the proposed policy formulation framework, presented in Table 3, is designed to directly address these issues.

Table 1
Proposed Policy Formulation Framework for Infrastructure Projects

Category	Policy Objective	Policy Action/s	Responsible Office/s	Key issues identified in the study
1. Strategic Alignment and Resource Allocation	Ensure alignment between project planning and funding to prevent delays and inefficiencies.	(1) Require detailed project planning before fund allocation to ensure accurate budgeting and avoid later adjustments. (2) Establish protocols for the timely release of funds, coordinated with project milestones and deliverables. (3) Implement a continuous monitoring system to track fund utilization and project progress, regularly reporting to stakeholders. (4) Develop an integrated planning process that involves coordination between the Planning Office, PMO, and PMC to ensure budgetary constraints are considered from the initial stages.	(1) - Planning and Development Services – Technical Planning Committee (2) - Finance Office (3) - Project Management Office and Project Monitoring Committee (4) - Administrative and Financial Affairs Division	Misalignment between Planning and Funding Project Management and Planning Issues Centralized Oversight and Improved Coordination
2.Enhanced Monitoring and Evaluation	Strengthen monitoring and evaluation to ensure projects stay on schedule and meet quality standards.	(1) Assign specific office to monitor timelines, budget utilization, and material deliveries to ensure adherence to the project plan. (2) Develop and implement standardized evaluation protocols to regularly assess project outcomes against objectives. (3) Implement digital tools for real-time monitoring of project progress, financial expenditure, and material delivery, enabling immediate corrective actions. (4) Develop performance dashboards for each project to give stakeholders a clear overview of project status, including potential risks and deviations from the plan. (5) Conduct audits and performance assessments at key milestones to ensure compliance with project schedules, budgets, and quality standards.	(1) to (5) - Project Management Office and Project Monitoring Committee	Insufficient Monitoring and Evaluation Evaluation and Improvement Challenges
3.Efficient Material and Labor Management	Improve material and labor management to prevent wastage and delays.	(1) Introduce an efficient material management system that includes proper storage, timely delivery, and accurate tracking of usage to minimize waste and damage. (2) Implement a system for tracking labor productivity based on person-hours rather than cost to ensure more accurate project timelines and resource allocation. (3) Just-in-Time Delivery System: Implement a just-in-time delivery system for materials, ensuring they arrive on-site as needed to prevent deterioration, theft, or damage due to prolonged storage. (4) Use advanced labor management software to forecast labor needs accurately and allocate resources based on project requirements, ensuring balanced productivity across all activities. (5) Establish clear protocols for material procurement, including detailed specifications, quality checks, and delivery schedules to avoid mismatches and overstocking.	(1) to (5) - Project Management Office and Project Monitoring Committee	Inefficient Material Management Imbalances in Labor Productivity Delays in Project Implementation Project Management Strategies for Timely Completion
4.Capacity Building and Skill Development	Enhance the skills and knowledge of all project stakeholders, including contractors, engineers, and university personnel.	(1) Establish ongoing training and capacity development programs for project stakeholders to ensure they are well-versed in best practices and new technologies. (2) Create a platform for knowledge sharing and best practices among stakeholders to address gaps in expertise and improve overall project execution. (3) Develop and implement certification programs for project managers, engineers, and contractors, focusing on the latest construction technologies, project management techniques, and quality control measures. (4) Organize cross-departmental training sessions to promote knowledge transfer between the PMO, PMC, and contractors, ensuring all parties are aligned on project objectives and standards. (5) Introduce mentorship and apprenticeship programs within the university's construction and project management teams to build expertise and ensure knowledge retention.	(1) to (5) - Admin and Finance Affairs and Human Resource Development Services	Knowledge and Skill Gaps Among Stakeholders Human Capital and Expertise Gaps Need for Specialized Expertise and Rigorous Procedures
5.Standardization of Processes and Protocols	Develop standardized processes and clear protocols to reduce confusion and improve project management efficiency.	(1) Adopt and formalize project management systems based on Department of Public Works and Highways (DPWH) practices, including standardized forms, guidelines, and checklists. (2) Clearly define the roles and responsibilities of each department involved in the project, ensuring accountability and minimizing conflicts of interest. (3) Develop a comprehensive set of standardized procedures for project management, including templates for project charters, risk assessments, and progress reports. (4) Automate key project management protocols using software tools to ensure consistency in documentation, approval workflows, and communication among stakeholders. (5) Clearly define roles and responsibilities across all departments involved in project execution, ensuring that each stakeholder understands their duties and has the authority to make necessary decisions promptly.	(1) to (5) - Admin and Finance Affairs and Project Management Office	Standardization and Clear Protocols Need for Standardization and Systematization
6.Quality Assurance and Control	Strengthen QA/QC measures to ensure the delivery of high-quality projects.	(1) Create a dedicated office responsible for QA/QC tasks, regularly monitoring project quality and adherence to standards. (2) Specify required testing and commissioning procedures in the Scope of Work (SOW) for all projects, ensuring these are rigorously followed during implementation. (3) Develop and implement a comprehensive QA/QC framework that includes detailed guidelines for material testing, site inspections, and final project evaluations. (4) Engage independent third-party auditors to conduct QA/QC assessments at critical project stages, ensuring objectivity and adherence to industry standards. (5) Introduce a mandatory defect liability period post-project completion, during which the contractor is responsible for addressing any identified defects at no additional cost to the university.	(1) to (5) - Admin and Finance Affairs, Project Management Office, QA/QC Committee	QA/QC Deficiencies
7.Continuous Improvement and Feedback Mechanisms	Foster continuous improvement through regular evaluation and adaptation of project management practices.	(1) Finalize and implement a Project Management Plan that serves as a comprehensive guide for all stakeholders, ensuring consistency in project execution. (2) Establish a feedback loop for ongoing projects, where lessons learned are documented and used to improve future project planning and execution. (3) Conduct thorough post-project reviews that involve all stakeholders, documenting successes, challenges, and areas for improvement for future reference.	(1) to (3) - Admin and Finance Affairs and Project Management Office	Critical Success Factors Proactive and Predictive Project Management Evaluation and Improvement Challenges

This framework aims to improve the efficiency and effectiveness of project execution, ensure timely deliveries, and enhance the quality of capital outlay projects.

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