Strategic Approaches to Construction Project Management and Their Impact on Time, Cost and Quality Performance A Survey Based Study

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ABSTRACT

The construction industry is a significant player in national development and has been facing long-lasting challenges of schedule delays, cost overruns and quality problems. This research focuses on strategy-based project management of construction professionals in the Philippines and how that project is managed in time, cost and quality. It also investigates the moderating effect of the National Building Code of the Philippines (Presidential Decree No. 1096) on the project. Data were collected from fifty construction practitioners and the descriptive statistics and correlation analysis were conducted to assess the impact of implementation of the National Building Code of the Philippines on the project implementation. We found that strategic management practices are applied in a comprehensive manner and the most prevalent are project planning, risk management and experiential learning and the majority of them are used in a comprehensive manner. There is a strong correlation between these methods and improvements in project performance. Quality, safety and operational benefits are also high for the National Building Code and strict compliance to the National Building Code is the most important. Our research shows that the integration of strategic project management and regulatory compliance is important to the successful construction project management and the best way to achieve this is through the integration of these aspects of the project management for the construction project.

THE PROBLEM AND ITS BACKGROUND

Background of the Study

The construction sector stands as one of the key contributors to economic development around the world. It serves an essential role in urbanization, infrastructure development, and employment generation in both developed and developing countries. Regardless of its importance, the sector continues to face long-term problems related to scheduling project delays, cost or budget overruns, and quality-related issues. These issues are commonly discussed in construction management studies and are often linked to poor administrative and coordination shortcomings.

As explained by K.K. Chitkara, poor monitoring systems and ineffective scheduling greatly create inefficiencies in project construction. As modern construction projects become more advanced due to technological evolution, sustainability requirements, and stricter regulatory frameworks, the demand for more systematic and strategic approaches to project management has become increasingly important. In the current project environment as outlined by scholars such as Harold Kerzner, integrated approaches are needed to bridge organizational scope and project execution to improve performance and maintain competitiveness.

Strategic approaches to construction project management involve structured coordination of planning, resource allocation, and performance monitoring to accomplish project purpose effectively, with risk management. These strategies address decision-making for future outcomes and ongoing evaluations throughout the project's life cycle. “Stakeholder engagement, risk assessment, and adaptive control systems are among the critical practices that can improve project outcomes,” write Jack R. Meredith and Samuel J. Mantel Jr. Project managers can gain more control over time, cost and quality performance by anticipating likely risks and addressing new challenges

early. Furthermore, strategic management models promote the application of innovative tools and methodologies that enable construction companies to respond more precisely to dynamic project conditions and slowly changing customer requirements.

Meanwhile, in the Philippine context, the construction industry continues to expand due to the ongoing investments in infrastructure development and urbanization programs. But as with global trends, local construction projects often face delays, budget constraints, and lack of quality performance. These problems are often linked to failures of the practical application of proven approaches to project management, lack of technical capacity, and differences in regulatory compliance. The National Building Code of the Philippines sets the rules for how to build safely, well, and in a way that is consistent with other buildings. But the effectiveness of the NBCP depends mainly on the proper implementation and synchronization of the project management processes. Moreover, the research results by David I. Cleland and Lewis R. Ireland revealed a significant gap between the theory of project management and the practice in the field. This gap is usually affected by factors such as lack of training, lack of willingness to change, and lack of awareness of strategic management practices among the practitioners in the industry.

In such circumstances, there is an apparent need to examine the use of strategic approaches in real construction contexts, as well as their effect on project performance outcomes. The study seeks to connect theory and practice by assessing the impact of different construction project management strategies on time, cost, and quality performance. The research aims to identify the best strategies and how well they are used in the industry. The research will involve survey research with engineers and contractors. In doing so, the study aims to provide evidence-based insights and practical recommendations that will improve project management practices, support regulatory compliance, and ultimately increase the overall performance and sustainability of construction projects in the Philippines.

Statement of The Problem

Planned project delays, cost overruns, and poor-quality outputs or results still reflect the long-term performance problems of construction projects. However, these problems remain common, despite the increased use of modern construction project management methods, which vary in their application and effectiveness. The inability to rationalize the management strategies with the project goals might lead to poor performance and thus affect the overall success of the building projects. Therefore, it is crucial to investigate the implementation of strategic approaches in construction project management and their contribution to critical performance parameters of the components, especially in terms of time, cost, and quality.

The study aims to address the following specific problems. The study's objective is to identify widely used strategic approaches in construction project management and assess the level of their implementation in construction projects. It also examines the extent to which these strategies affect the project's performance outcomes or results, especially in terms of schedule, budget efficiency, and quality standards.

The research study also investigates the presence of significant differences in project performance based on the application of various strategic approaches. Additionally, it reviews the challenges found by construction professionals in implementing these strategies effectively. Lastly, the research study determines the relationship between the level of strategic planning and the overall success of construction projects, providing a reference for improving management practices within the industry.

General Research Statement:

This study aims to determine the strategic approaches utilized in construction project management and their impact on project performance in terms of time, cost, and quality performance among construction professionals.

Specific Research question

What is the demographic profile of the respondents in terms of:

I. What is the profile of the respondents in terms of:

- Age;
- Sex;
- Position or role;
- Years of experience; and
- Type of project?

II. What is the level of implementation of strategic approaches to construction project management in terms of:

- Project planning;
- Risk management;
- Use of modern methods and techniques;
- Stakeholder communication and involvement;
- Resource management; and
- Continuous improvement through learning from past projects?

III. What is the level of project performance in terms of:

- Time performance;
- Cost performance; and
- Quality performance?

IV. To what extent do strategic approaches to construction project management contribute to overall project success in terms of:

- Time;
- Cost; and
- Quality performance?

V. Is there a significant relationship between the level of implementation of strategic project management approaches and project performance in terms of time, cost, and quality?

VI. What is the level of compliance of construction management practices with the provisions of the National Building Code of the Philippines?

VII. Is there a significant relationship between compliance with the National Building Code of the Philippines and project performance in terms of time, cost, and quality?

Objective of The Study

The main objective of this study is to assess the strategic approaches applied in construction project management and study their impact on project performance (budget, schedule, and quality). The study aims to identify the

different management techniques used by construction experts and to determine the effectiveness of these techniques in achieving project objectives. Moreover, it seeks the relationship between project performance and strategic management approaches.

The study also aims to evaluate how risk management, scheduling, planning, and quality control procedures improve project outputs. This will assess whether proactive management will be better than more traditional or reactive management. The study also aims to identify shared issues faced by project managers in implementing strategic ideas and their effect on project performance. The research aims to provide suggestions for improving building project management procedures. The recommendations stemming from the survey findings will help construction industry professionals to adopt more efficient techniques in project management and thereby increase productivity, decrease project cost, and achieve quality levels in construction projects on a continuous basis.

Significant of the Study

This study is extremely valuable as it offers a methodical analysis of how strategic methods in construction project management affect time, cost, and quality performance. The research presents both theoretical and practical contributions that can enhance decision-making and operational efficiency in the construction industry through the identification and evaluation of effective management solutions. The findings aim to close the gap between the theoretical principles of project management and how they are practically applied and to inspire industry experts and stakeholders to implement more systematic, evidence-based procedures.

This study is an instructive tool that will help students, particularly those interested in engineering and construction management, better comprehend project management techniques, and their direct impact on project outcomes. It provides students with valuable insights that go beyond classroom discussions and helps develop analytical and problem-solving skills relevant to real building situations.

The study provides faculty with current and relevant materials for use in lectures, case discussions, and curriculum development, thereby improving instructional methods and aligning academic content with current business practices. The results of this research can also benefit administrators in academic institutions in designing programs to ensure that courses continue to be responsive to industry needs and trends. The study also contributes to institutional objectives of producing competent graduates who can meet professional demands. This work also provides a benchmark for future research, which can use the study as a reference point to further explore construction management strategies either for comparative analysis, model formulation, or exploring new avenues in different contexts or variables.

Research participants include project managers, engineers, contractors, and others who would directly benefit from the research findings as they represent their experiences and best practices in the industry. Knowing which strategies yield better results on projects can help them improve their management strategies and execute projects more effectively. The findings of this study can also be used by other stakeholders, such as industry professionals, legislators, and regulatory agencies, to influence the evolution of best practices, laws, and guidelines that promote high- performance and sustainable building projects. Overall, the study advances professional practice in building project management and knowledge.

Scope and Limitation

This study aims to examine the strategic methods applied in construction project management and their impact on project performance, particularly in terms of time efficiency, cost control, and quality outcomes. Construction professionals, including engineers, contractors, and project managers involved in managing and executing construction projects, are the intended audience for this research. These participants are selected for their first-hand experience and practical knowledge of project management strategies and performance outcomes.

The research is geographically constrained to a particular and accessible zone to facilitate data collection and local construction practices. It presents current and recent construction projects in the chosen location. The study's timeframe is restricted to the period of data collection via survey instruments, representing current

practices and recent project experiences. The main variables studied are strategic project management methods (planning techniques, communication practices, risk management strategies, and resource allocation methods) and their corresponding effects on project performance indicators, such as time, cost, and quality.

Despite its focused scope, the study has several limitations that must be acknowledged. First, the research relies on a survey-based method using self-reported data, which may be subject to response bias, personal judgment, or inaccuracies in recall. Second, the study is limited to a specific geographic area and a selected group of respondents, which may restrict the generalizability of the findings to other regions or broader construction contexts. Third, the research does not include all types of construction projects, omitting large international projects and highly specialized infrastructure projects, which could have more complex management systems. Furthermore, this study is based on strategic approaches and does not include all factors outside the project that may affect the project's performance, such as economic changes, political situations, policy changes, and unpredictable environmental factors. These variables are important, but beyond the scope and control of the present research.

Also, the sample size of fifty (50) construction professionals was determined using Slovin's formula and was considered sufficient for the descriptive-correlational design of the study; however, it may have constrained the statistical power for more sophisticated analyses, such as multiple linear regression. Consequently, the strategic approaches may have exerted smaller predictive effects on project performance that went unnoticed. Furthermore, the use of purposive and convenience sampling may restrict the generalizability of the findings beyond those of the selected respondents. Future studies are encouraged to include a larger sample size from different geographical locations and to use probability sampling techniques, where feasible, to further strengthen the statistical analysis and improve the generalizability of the findings.

But these limitations do not diminish the value of the study. Instead, they define its boundaries and ensure the research is on track, doable, and based on realistic conditions. It is expected that the results will offer relevant and practical insights on how strategic approaches in construction project management can affect project success within the defined scope.

Definition Of Terms

For clarity and better understanding of the study, the following terms are defined operationally based on their use within this research and supported by relevant literature:

Construction Project Management

Refers to the application of knowledge, skills, tools, and techniques in planning, coordinating, monitoring, and controlling construction activities to achieve project objectives within the specified scope, time, cost, and quality requirements (Project Management Institute [PMI], 2021).

Continuous Improvement through Learning from Past Projects

Refers to the process of evaluating completed projects to identify lessons learned, best practices, and areas for improvement, which are applied to enhance the performance of future construction projects (PMI, 2021).

Cost Performance

Refers to the extent to which a construction project is completed within its approved budget through effective cost planning, monitoring, and control. In this study, it is measured based on the respondents' assessment of budget efficiency during project implementation (PMI, 2021).

National Building Code of the Philippines (NBCP) Compliance

Refers to the extent to which construction management practices comply with the requirements and standards prescribed under Presidential Decree No. 1096, also known as the National Building Code of the Philippines. In this study, it pertains to the respondents' perceived level of compliance during project implementation.

Project Performance

Refers to the overall success of a construction project as measured by its achievement of planned objectives in terms of time, cost, and quality. In this study, project performance serves as the dependent variable (PMI, 2021).

Project Planning

Refers to the systematic process of defining project objectives, schedules, resource requirements, work activities, and implementation strategies before project execution. In this study, it represents one of the strategic approaches evaluated for its influence on project performance (Kerzner, 2022).

Quality Performance

Refers to the extent to which the completed construction project satisfies established quality standards, technical specifications, and client requirements. In this study, it is measured through respondents' perceptions of the project's quality outcomes (Juran, 1988).

Resource Management

Refers to the effective allocation, utilization, and monitoring of human resources, materials, equipment, and financial resources to support efficient project implementation. In this study, it is considered one of the strategic approaches affecting project performance (PMI, 2021).

Risk Management

Refers to the systematic identification, assessment, analysis, and response to potential project risks that may affect project objectives. In this study, it pertains to the strategies employed by construction professionals to minimize uncertainties and improve project outcomes (Hillson, 2009).

Stakeholder Communication and Involvement

Refers to the continuous exchange of information, coordination, and collaboration among project stakeholders, including clients, contractors, consultants, engineers, and regulatory agencies, throughout the project lifecycle. In this study, it is measured as one of the strategic management approaches that contribute to project success (Freeman, 1984).

Strategic Approaches

Refers to the planned and systematic management practices adopted by construction professionals to improve project execution and achieve desired project outcomes. In this study, strategic approaches include project planning, risk management, use of modern methods and techniques, stakeholder communication and involvement, resource management, and continuous improvement through learning from past projects (Porter, 1985).

Time Performance

Refers to the extent to which a construction project is completed within its planned schedule. In this study, it is measured based on respondents' perceptions of adherence to project timelines and schedule efficiency (PMI, 2021).

Use of Modern Methods and Techniques

Refers to the adoption of contemporary project management tools, digital technologies, innovative construction methods, and management techniques to improve planning, monitoring, coordination, and decision-making during project implementation. In this study, it is evaluated as one of the strategic approaches influencing project performance (Kerzner, 2022).

REVIEW OF RELATED LITERATURE AND STUDIES

Introduction

This chapter provides a review of the key theories, literature, and studies on strategic methodologies in construction project management and their impact on project performance. The next sections provide a background to assess how management strategies might influence the KPIs in terms of time, cost, and quality.

The following part is separated into five parts that are the theoretical framework, review of related literature, review of related studies, the conceptual framework of the study, and the hypothesis of the study. The central variables such as planning, scheduling, risk management, resource allocation, and communication are addressed and considered in the survey tool for data collection in the chapter.

This chapter, based on local and international information, provides insights on how successful strategic project management is related to a higher level of effective construction end results.

Theoretical Framework

In this chapter, the theoretical framework of this study is taken by using existing theories related to management and project results, which can explain why and how such strategic approaches impact project performance. These theories verify the association between the two independent variables (strategic approach) and dependent variables (time, cost, and quality of performance), and the motives for including them in the instruments used for the study. The following are the theories used in this research.

Project Management Triangle Theory (Barnes, 2006) and the Project Management Institute (PMI, 2021)

The Project Management Triangle Theory, or the Triple Constraint Theory, was introduced by Barnes (2006) and is still one of the basic theories in project management today. The theory goes that there are three interdependent constraints on every project: time, cost, and quality (or scope/performance). The theory says that a change in any one constraint has to affect the others. For example, if the project, for instance, finishing the project sooner may require more money or result in changes to its quality or scope. Sooner, it may take more money or change the quality or scope of the project. Cost reductions can also lead to schedule overruns or quality degradation if not properly managed. Project managers therefore need to balance these constraints to deliver successful project outcomes.

The significance of this theory: Even now, project management practices acknowledge the importance of this theory in today's project management. The Project Management Institute (PMI, 2021), in the Project Management Body of Knowledge (PMBOK® Guide), Seventh Edition, states that successful project management is about balancing competing project constraints and delivering value to stakeholders. The PMBOK Guide highlights the importance of effective planning, stakeholder engagement, risk management, quality control, and flexible decision-making throughout the project lifecycle, rather than simply defining project success as finishing a project on time and within budget. These principles support the concept that project performance is a function of the management of the interrelationship between schedule, cost, quality, resources, risks, and stakeholder expectations.

Hence, in the construction industry, a strategic approach encompassing comprehensive project planning, effective scheduling, efficient resource allocation, proactive risk management and continuous quality control is a must to maintain the balance of time, cost and quality. Such management practices are recognized in the PMBOK® Guide (PMI, 2021) as critical success factors of project delivery, as they enable the project managers to cope with uncertainties, utilize the available resources to the maximum, and improve the overall performance of the projects.

This approach enables construction organizations that use strategic project management methods to better prevent delays, control project costs, and maintain required quality standards. Strategic project management

methods make for better prevention of delays, control project costs, and maintain required quality standards even when project conditions change.

The main theory that this research study is based on is the Project Management Triangle Theory. It confirms the assumption that the strategic approaches of construction project managers have a direct impact on the project performance outcomes. In this study, effective strategic planning, scheduling, communication, risk management, resource management and quality management were found to lead to better completion of the project in the planned schedule, approved budget and required quality standards. Therefore, this theory is the main framework for explaining the relationship between strategic construction management practices (independent variables) and project performance (dependent variables) in time, cost, and quality.

Systems Theory (Ludwig von Bertalanffy, 1968)

Systems theory is the view of an organization or project as a system with components that connect with each other and are interrelated to one another. Bertalanffy (1968) proposed that the performance of the whole system depends on the performance and interaction of its parts.

Planning, scheduling, risk management, and communication are projects in construction that must work in coordination. The theory is relevant to the study as it explains how strategic approaches collectively influence project performance. Incorporating legal requirements such as PD 1096 can also fortify the system; ensuring compliance and standardization across all project components.

Total Quality Management (TQM) Theory (W. Edwards Deming, 1986)

Total Quality Management (TQM), proposed by Deming (1986) is a broad management philosophy that emphasizes continuous improvement, customer satisfaction, employee involvement, and process optimization to achieve organizational excellence. Deming says, “Quality is everyone’s job.” Quality should not be the sole responsibility of quality inspectors. Quality should be everyone’s responsibility in the organization. The continuous improvement and systematic management of work processes allow organizations to reduce errors, minimize waste, improve efficiency, and provide products and services that meet or exceed customers’ expectations.

Total Quality Management is crucial for construction project management since construction projects need to strictly follow design specifications, safety standards, regulatory requirements, and client expectations. TQM implementation requires project managers and construction teams to define quality standards at each stage of the project, such as planning, design, procurement, construction, inspection, and project turnover. When quality management is included in all project activities, it can help organizations reduce defects, avoid expensive rework, increase productivity, and improve the overall performance of projects.

The recent literature supports Deming’s philosophy of Total Quality Management (TQM) being relevant today. TQM is still one of the best management approaches to achieve operational excellence through continuous improvement, employee participation, leadership commitment, and customer-focused decision-making (Oakland, 2022). Organizations that apply TQM principles consistently are better able to increase process efficiency, decrease operational costs, and maintain high-quality outputs in increasingly competitive environments (Oakland, 2014).

Bondre et al. (2022) mentions that quality management is a core part of successful construction project delivery and should be diligently implemented throughout the entire project life cycle. In a systematic literature review, the authors synthesized the previous studies on the quality management practices in the construction industry and found that the consistent application of quality planning, quality assurance, quality control, and continuous monitoring contribute to improving project performance by ensuring the compliance with the established quality standards, minimizing construction defects, and enhancing the overall efficiency of project execution. The review also stressed that the incorporation of quality management into all stages of construction, ranging from project planning and design to implementation and completion, enables construction organizations to guarantee the reliability and consistency of project outputs and enhance overall operational efficiency. The authors

concluded that organizations that apply structured quality management practices are better positioned for successful project results by continuous process improvement and meeting quality requirements. The findings support Deming's Total Quality Management philosophy which emphasizes continuous improvement, organizational commitment and integration of quality into all organizational processes as essential foundations for successful construction project performance.

In the context of this research study, Total Quality Management serves as a significant theoretical basis for explaining the role of quality-oriented strategic approaches in project outcomes. Construction companies can maintain high-quality standards and effectively control project costs and schedules by adopting strategic practices such as quality planning, quality assurance, continuous monitoring, employee training, process improvement, and stakeholder engagement. The use of TQM principles improves the success of construction projects through improved quality performance, reduction in rework, reduction in delays, and increased overall project effectiveness. This theory thus supports the assumption of the study that strategic management approaches have a significant contribution in improving the time, cost, and quality performance of construction projects.

Contingency Theory (Fred Fiedler, 1964)

According to Fiedler's (1964) contingency theory, there is no one best way to manage or one best leadership style for every project or organization. But the performance of the management is dependent on the situation and context for the project. The theory states that project managers should assess settings including project complexity, organizational structure, resources availability, stakeholders' expectations, environmental uncertainty and team capabilities and adjust their leadership and management strategies accordingly. The theory suggests that the success of a project doesn't come from one approach; rather, project management should be consistent with the project's needs.

Contingency theory is very relevant in the context of construction project management, as construction projects are different from each other in terms of size, complexity, location, contractual arrangements, technology, resources available and external risks. Each construction project presents its challenges, forcing project managers to adapt their strategies for planning, scheduling, communication, resource deployment, risk management, and quality assurance. Construction organizations adopt flexible and situation-based management approaches to respond better to the changing project conditions and to meet project objectives related to time, cost, and quality.

According to Kerzner (2022), "Contingency theory is still valid today." Project management today requires flexible leadership and decision-making in order to adjust to the fluidity of projects. According to Kerzner, project managers should not rely on a single management methodology because projects occur in an environment of uncertainty, technological change, changing stakeholder expectations, regulatory requirements, and resource constraints. Good project managers are always evaluating the conditions of the project and changing their management approaches to make sure the project is successful. Kerzner went on to say that adaptive project management helps organizations improve their project performance by reducing delays, controlling costs, managing risks, and maintaining quality standards when project circumstances change.

This point of view is particularly important in the construction industry because project execution is frequently influenced by unexpected factors like material unavailability, labor shortages, weather conditions, design modifications, regulatory changes, and economic constraints. Using flexible planning, proactive risk management, effective stakeholder engagement, and efficient resource utilization, contingency theory enables project managers to formulate appropriate strategic responses to these challenges. In the face of uncertainty and shifting project circumstances, this kind of flexibility helps achieve project goals.

Contingency theory provides an important theoretical basis for explaining the reasons why different strategic management approaches yield different levels of project performance in the context of this research study. The theory supports the assumption that construction project managers who adjust their strategies to the specific needs and conditions of each project are more likely to finish projects on time, within budget, and according to established quality standards. Contingency theory thus supports the study's statement that flexible, contextual strategic approaches have an influence on the time, cost, and quality performance of construction projects.

Critical Path Method (CPM) Theory (James E. Kelly Jr. And Morgan R. Walker, 1957)

The Critical Path Method (CPM) was developed by Kelley and Walker (1957) and is one of the most widely used scheduling techniques in project management. The method finds the order of activities of a project and finds the least time needed to complete a project. These activities are called the "critical path." There is no slack or float in these activities; that is, any delay to a critical activity will delay the completion of the whole project. CPM enables project managers to plan, schedule, monitor, and control project activities in a systematic manner while ensuring that the available resources are used efficiently to achieve the project objectives within the planned time frame.

The Critical Path Method is particularly significant in construction project management because construction projects involve many interrelated activities that need to be carefully coordinated. Project managers use critical and non-critical activities to prioritize important activities, plan out the labor and equipment needed, monitor progress, predict possible delays, and take corrective action when needed. Thus, CPM helps in better schedule management, effective utilization of resources, reduction in project delays, and better coordination among project stakeholders.

As per Kerzner (2022), the Critical Path Method is still relevant. He states that CPM is one of the main methodologies for scheduling and project control in current project management. Kerzner says that project managers can use effective scheduling to track project performance, compare progress against set milestones, identify schedule risks, and take prompt management action to minimize delays and enhance project outcomes. He went on to describe how the chance of projects being completed on time, within budget and to the required quality standards can be improved by using CPM in conjunction with other project management techniques such as resource planning, risk management and performance monitoring.

In the same vein, the Project Management Institute (PMI, 2021) in its A Guide to the Project Management Body of Knowledge (PMBOK® Guide), Seventh Edition acknowledges schedule management as a major contributor to the successful implementation of projects. The PMBOK® Guide addresses determining activity dependencies, estimating activity durations, developing realistic project schedules, and monitoring project progress throughout the project life cycle. The Seventh Edition follows a principles-based approach, but acknowledges the value of traditional scheduling techniques, such as the Critical Path Method, as useful tools in supporting effective project planning, schedule control, decision-making, and value delivery. These practices assist project managers to react proactively to schedule changes, deal with project uncertainties, and stay aligned with project objectives.

Cost overruns, contractual disputes, lower productivity, and lower client satisfaction are some of the consequences of delay in construction projects. To manage project time, project managers have to apply CPM which gives them a structured framework. Construction organizations can mitigate schedule risks, increase stakeholder coordination, and maintain project performance even when project conditions change through ongoing schedule monitoring and corrective actions.

REVIEW OF RELATED LITERATURE

This study has gathered significant interest and investigates the possibilities of different approaches to construction project management. This review of related literature is organized into key themes aligned with the study variables: planning, scheduling, risk management, resource allocation, communication, and project performance (time, cost, quality).

Strategic Project Management and Construction Project Performance

With technological developments, sustainability requirements, stakeholder expectations, and economic uncertainties, construction projects have become increasingly complex. Therefore, strategic project management has become a key factor in achieving successful project results. Strategic project management is the systematic application of planning, scheduling, risk management, resource allocation, and communication from the beginning to the end of the project life cycle to effectively achieve organizational objectives. Strategic project

management is the alignment of project objectives with the organizational strategy, enabling managers to make informed decisions, optimize resources, and respond effectively to project uncertainties (Project Management Institute, 2021). Similarly, Kerzner (2022) stressed that the strategic management of companies has a higher success rate in projects due to better coordination, planning a accuracy, and risk management.

The concept of project success is still strongly related to the Project Management Triangle, also known as the Iron Triangle, which evaluates project performance in terms of time, cost and quality. While modern researchers have introduced other measures of success, including sustainability and stakeholder satisfaction, the Iron Triangle continues to be the main framework for assessing the performance of construction projects. The Project Management Institute (2021) defines successful projects as those completed within the approved schedule and budget and fulfilling quality requirements. Kerzner (2022) also pointed out that although the complexity of projects is increasing, the balance of these three constraints is still the foundation of effective construction project management.

Planning is one of the most important activities in strategic management during the whole life cycle of a project. Good planning allows an organization to establish realistic goals for a project, identify the resources it will use, predict constraints, and be prepared to deal with problems before they arise. According to Kerzner (2022), the more detailed the planning, the less uncertainty there will be in the project. Also, it will improve project control by improving the accuracy of forecasting and decision-making. Furthermore, the success of construction projects depends on the ability to plan flexibly and strategically, in order to effectively deal with project uncertainties and changing project conditions (Göküz and Akıner, 2025). Through their systematic review, they identified project management competency, well-defined project objectives, effective leadership, stakeholder coordination and adaptive management practices as critical success factors affecting construction project performance. The authors indicated that construction organizations that employ strategic and adaptive planning strategies are better placed to mitigate project risks, improve coordination, enhance decision-making and sustain project performance in the face of organizational and environmental challenges. These results suggest that good planning improves the resilience of projects and helps to improve schedule, cost, and quality performance in construction projects.

Another important strategy component of construction project management is scheduling. Construction schedules order the project activities, establish interdependences between activities and set time limits for the project completion. The Critical Path Method (CPM) remains one of the most popular scheduling techniques, as it identifies activities that affect the project's duration. According to the Project Management Institute (2021), CPM helps in project monitoring and schedule control through identifying critical activities that need close supervision. However, Kerzner (2022) argued that modern construction projects require a combination of traditional scheduling methods, risk-based scheduling, and digital monitoring technologies to increase the reliability of schedules in uncertain project conditions.

Risk management has also grown to be one of the most studied strategic management practices in construction. Construction projects are exposed to various financial, technical, environmental, contractual, and operational risks, which, if not managed well, can have adverse impacts on the performance of the project. Effective risk management is a systematic process of identifying, assessing, planning responses and continuously monitoring risks throughout the life cycle of the project to minimize threats that can lead to schedule delays and cost overruns (Project Management Institute, 2021). Moreover, recent systematic reviews have revealed the effectiveness of using digital technologies such as artificial intelligence (AI), machine learning and Building Information Modelling (BIM) in improving risk prediction, real-time monitoring and decision-making in construction projects, especially in complex projects.

Another important factor affecting construction project performance is the allocation of resources. Effective management of labor, equipment, construction materials and financial resources reduces wastage and increases productivity in the process of project implementation. Strategic resource planning helps organizations maximize productivity while still adhering to project schedules and cost control (Kerzner, 2022). Furthermore, Oakland (2022) noticed that efficient resource allocation enhances the efficiency of operations, cuts unnecessary costs, and leads to continuous quality enhancement in construction operations. Recent empirical evidence also shows

that organizations using integrated resource management systems obtain significantly higher project performance compared to organizations using conventional resource planning methods.

The importance of communication management as one of the most influential factors affecting the success of construction projects is still recognized. There is continuous interaction between the project owners, contractors, consultants, subcontractors, suppliers, regulatory authorities, and local populations in the construction projects. Communication is important to ensure timely information sharing, coordination, collaborative decision-making, and the possibility of miscommunication reduction between project stakeholders. The Project Management Institute (2021) argues that successful stakeholder engagement and project success hinge on effective communication management. "Poor communication is one of the leading reasons for delays in buildings, cost overruns and poor quality" (Kerzner, 2022). Recently, Seyis and Ozkan (2024) said that implementation of Common Data Environments (CDEs) in BIM based construction projects leads to improved communication, information transparency, collaboration and coordination among multidisciplinary teams thus enabling more efficient project management.

Consistent results from the reviewed literature suggest that strategic project management practices, including planning, scheduling, risk management, resource allocation, and communication, jointly affect construction project performance. The implementation of these strategic management practices helps construction organizations to enhance project efficiency, reduce risks, optimize resource utilization, promote stakeholder collaboration and attain project objectives within the limit of time, cost and quality. These findings provide a strong theoretical and empirical basis for the present study, which investigates the effect of strategic project management on construction project performance.

REVIEW OF RELATED STUDIES

This section provides an overview of previous studies in relation to strategic management practices and construction project performance. By looking at past studies, we can establish a strong foundation for current research and understand the important ideas that have already been developed.

International Studies

Recent studies have emphasized the importance of effective strategic management practices in determining construction project performance. These studies consistently demonstrate that successful construction projects depend not only on technical expertise but also on the effective implementation of strategic management approaches, including project planning, scheduling, coordination, leadership, communication, and risk management. As construction projects become increasingly complex due to technological advancements, stakeholder involvement, and project uncertainties, researchers have highlighted the need for integrated management strategies that enhance project efficiency, minimize risks, and improve project outcomes in terms of time, cost, and quality. The findings of these international studies provide substantial empirical evidence supporting the importance of strategic approaches in construction project management.

Göküz and Akıner (2025) conducted a systematic review of the published literature using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework to identify the critical success factors influencing international construction projects. The review integrated findings from many empirical studies and identified project management competency, technical expertise, clearly defined project objectives, contract management, effective leadership and stakeholder collaboration as some of the most important determinants of project success. The authors also stressed that organizations with strong managerial capabilities, effective communication systems, and competent leadership always achieved superior project performance. The results also showed that successful construction projects require strategic planning, efficient coordination and continuous management throughout the project life cycle to achieve the project objectives within the required time, budget and quality standards. These findings are in favor of the current study as they emphasize the importance of strategic management practices in improving construction project performance and attaining successful project outcomes.

Alnajjar et al. (2025) conducted a systematic review of 64 published studies to gather evidence on the application of Lean Construction, Building Information Modelling (BIM), and emerging technologies in construction project management. The review identified that strategic management practices in the areas of project planning, scheduling, coordination, and integration of digital technology positively impact project efficiency, decision-making, collaboration, and overall project performance. Researchers further added that the integration of Lean Construction principles with BIM and emerging technologies leads to improved communication between project participants, better use of resources, real-time project monitoring, and better decision-making throughout the project life cycle. The study also found that employing these strategic approaches enables construction organizations to minimize delays, reduce unnecessary costs, improve productivity, and achieve higher quality project outcomes. These results support the conceptual framework of the present study by showing the collective effect of strategic management practices on construction project performance in terms of time, cost, and quality.

Tobar-Montilla et al. (2025) conducted a systematic review on uncertainty management in construction project scheduling. Their review synthesized the findings of 83 previous studies and classified the primary sources of uncertainty affecting construction schedules into internal and external categories. The authors concluded that project scheduling performance is significantly influenced by organizational complexity, resource availability, environmental conditions, logistics, and market-related uncertainties. The study proposed a taxonomy of uncertainty management approaches, including decision-making frameworks, stochastic models, fuzzy techniques, and uncertainty theory-based methods, to support more adaptive planning and informed decision-making in construction projects. The researchers further emphasized that uncertainty is an unavoidable aspect of construction projects and should be addressed through flexible scheduling strategies and continuous assessment rather than relying solely on conventional scheduling methods. The findings suggest that integrating uncertainty management into project scheduling can enhance project performance by improving schedule reliability, strengthening project adaptability, and supporting more effective management of delays and project risks. These findings reinforce the importance of project scheduling as a strategic approach that contributes to successful construction of project performance.

Zhasmukhambetova, Evdorides and Davies (2025) carried out a systematic review on the integration of risk assessment and scheduling techniques in highway construction projects. The review considered conventional scheduling methods such as Critical Path Method (CPM) and Program Evaluation and Review Technique (PERT), and sophisticated risk evaluation methods such as Monte Carlo Simulation, Fuzzy Set Theory, Analytical Hierarchy Process (AHP) and other probabilistic methods. The authors concluded that the inclusion of risk assessment in project scheduling improves decision making, schedule reliability, and project adaptability to uncertainty. “By integrating risk assessment with scheduling, project managers can better anticipate uncertainties, improve cost efficiency and enable more reliable project planning and execution,” they added. The study concluded that hybrid risk-informed scheduling frameworks are more effective approaches for managing complex highway construction projects under uncertainty. The researchers also found that integrating risk management into the entire scheduling process enables project teams to respond proactively to potential disruptions, increasing the resilience of the project and helping to facilitate better project execution. Their results support the present study by showing that the combination of strategic risk management and project scheduling improves construction project performance in terms of time, cost, and quality. Overall, the reviewed international studies consistently indicate that strategic management practices such as project planning, scheduling, leadership, coordination and communication, digital technology integration, uncertainty management and risk management are important determinants of construction project success. The studies, despite differences in project type, geographical location and research methodology, all concluded with the same finding that projects backed up by comprehensive planning, good coordination, effective leadership, continuous monitoring and proactive risk management can consistently attain better performance in terms of on-time completion, cost efficiency and quality outcomes. Moreover, the adoption of modern technologies and adaptable management styles improves the project decision-making process and the ability of organizations to handle the complexities of modern construction projects. The results of these international studies provide strong empirical support to the current study by reinforcing the proposition that strategic approaches in construction project management have significant impact on construction project performance in terms of time, cost and quality.

Philippine Studies

Recent studies in the Philippines highlighted the importance of strategic project management practices to improve the performance of construction projects, especially in government infrastructure projects where delays, cost overruns, coordination issues, and resource limitations continue to impede successful project delivery. Each of these studies demonstrates that effective planning, communication, monitoring, risk management and stakeholder collaboration are critical to achieving project objectives on time, within budget and to the required quality. The findings provide important local evidence for the practice of strategic management in the Philippine construction industry.

Garcia and Pilar (2025) studied the causes of delay of construction projects of Mati City, Davao Oriental. Exploratory factor analysis and analysis of variance were used to analyze the responses of 289 stakeholders in the public and private construction sectors to identify the most significant factors affecting project implementation. The results showed that the major causes of project delays were project management deficiencies, financial constraints, environmental conditions, labour shortages, and poor coordination between the project participants. The study further found that project management practices such as effective planning, communication, supervision and coordination of stakeholders significantly influence the improvement of construction performance irrespective of the project type. The researchers opined that improved project planning processes, improved communication between stakeholders and improved project supervision could significantly mitigate project delays and improve project implementation. These results reaffirm the present study's emphasis on strategic management variables by showing that effective project management practices directly contribute to better construction performance and successful project completion.

Pedron et al. (2025) developed a strategic framework for mitigating delays in road construction projects in the Philippines through the Analytical Hierarchy Process (AHP). The objectives of the study were to determine and rank the most important causes of project delay by collecting expert opinions from the Department of Public Works and Highways (DPWH), private contractors, and academics. The findings revealed that poor financial management, inadequate planning and scheduling, subcontractor-related issues, and regulatory bottlenecks were the most critical causes of delays in road construction projects. The researchers, based on these findings, proposed a strategic framework that focuses on proactive planning, continuous risk assessment, stakeholder coordination, systematic project monitoring and evidence-based decision-making throughout the project implementation process. Additionally, the study found that implementing these strategic management practices can lead to better project efficiency, fewer delays, lower unnecessary costs, and an overall improvement in the quality of project delivery. The findings of the study support the present study by demonstrating that effective planning, coordination, monitoring and risk management are essential strategic approaches for improving construction project performance and achieving successful project outcomes.

The Philippine studies reviewed consistently indicate that strategic management practices such as project planning, scheduling, communication, risk management, stakeholder collaboration, supervision, monitoring and efficient resource allocation have a significant impact on construction project performance. Poor planning, insufficient stakeholder coordination, financial constraints, ineffective monitoring, and weak management practices are cited as the primary reasons for project delays and cost overruns in both public and private construction projects. On the other hand, projects with systematic planning, proactive risk management, continuous monitoring, effective communication and collaborative decision making were found to achieve better results in terms of on-time completion, cost efficiency and quality performance. These studies collectively provide strong empirical evidence that strategic project management practices are critical in improving construction project performance of the Philippine construction industry. Their findings strongly bolster the significance of exploring how strategic approaches in construction project management influence project performance in terms of time, cost, and quality, thus reinforcing the present study.

CONCEPTUAL FRAMEWORK

Figure 1:

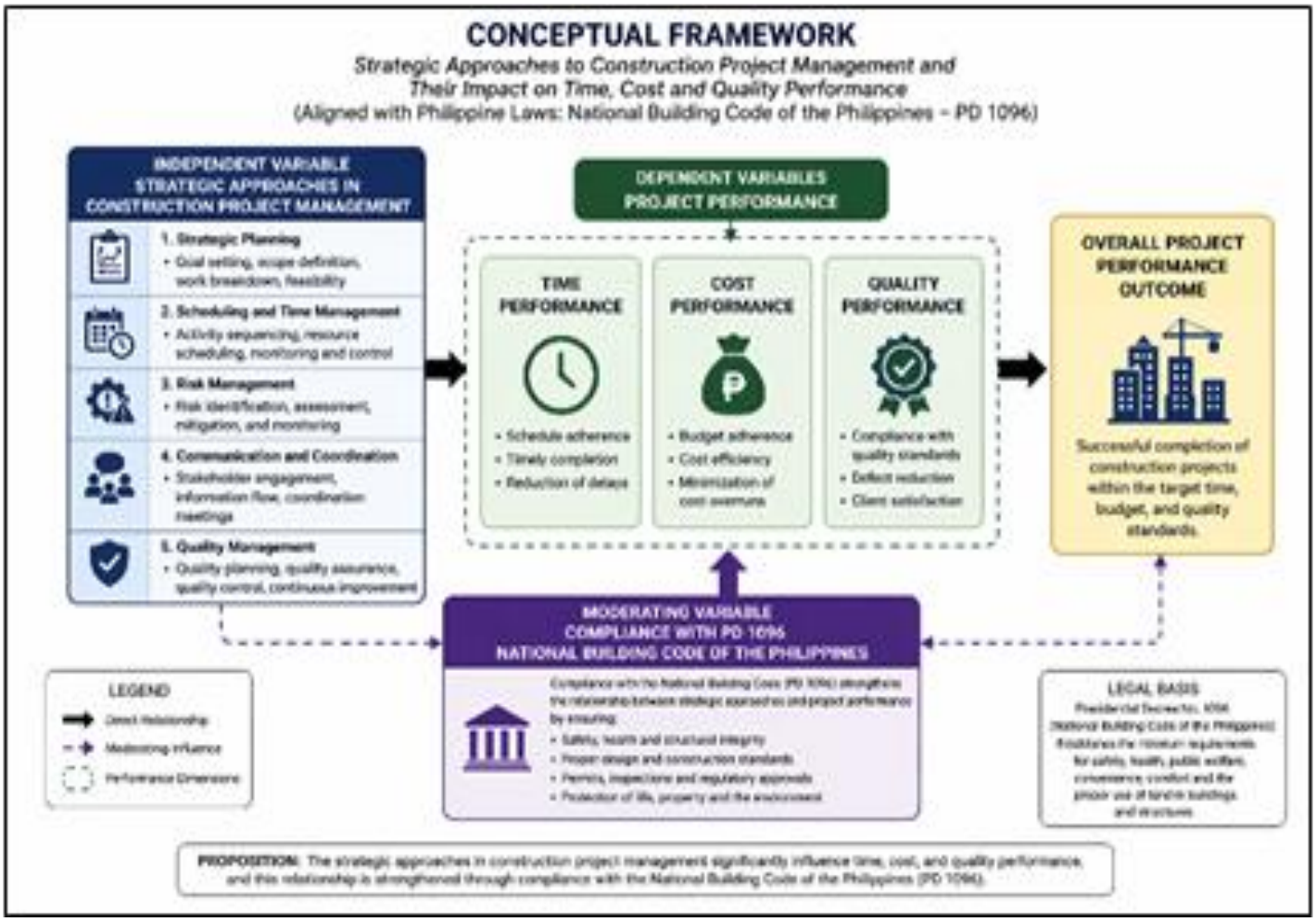

Figure 1 presents the conceptual framework of the research, demonstrating the link between strategic approaches in construction project management and project performance outcomes. This assumption is the basis of the framework; thus, the way construction projects are managed, planned, and executed clearly influences their success in terms of time, cost, and quality. It is likewise aligned with the data collection instrument, where each variable is interpreted into measurable terms.

The independent variable (IV) represents strategic approaches used in construction project management, consisting of planning, scheduling and time management, risk management, communication and coordination, and quality management. Strategic planning includes scope definition, goal setting, analysis, and work breakdown. Scheduling and time management represent resource scheduling, task sequencing, and project monitoring and control to guarantee on-time completion.

Risk Management consists of risk identification, mitigation, monitoring, and assessment. Communication and coordination deal with stakeholder participation, progress meeting, and information propagation efficiency. Lastly, quality management contains quality control, assurance and planning, and ongoing quality enhancement to ensure that project outcomes meet accepted criteria or standards.

The dependent variable (DV) in the study is project performance which is determined in terms of time, cost, and quality performance. Time performance includes on-time completion, schedule adherence, and shortened delay periods. Cost performance refers to cost-effectiveness, budget adherence, and cost overruns of reduction. Quality performance consists of defect reduction, client satisfaction, and compliance with quality criteria or standards. These variables collectively influence the overall project performance results, which is the effective accomplishment of the construction projects within the target time, budget, and quality standards.

The framework introduces successful implementation of strategic approaches that promote improved project performance. Particularly, planning, scheduling, and time management strengthen time performance by ensuring correct organization and execution of the task. Risk management assists in cost performance by preventing financial losses and reducing risk factors. Meanwhile, communication and coordination, as well as quality management, enhance quality performance by verifying that deliverables of the study meet required standards and stakeholder expected outcome.

In addition, the research study introduces a moderating variable (MV), that is compliance with PD 1096 (National Building Code of the Philippines). This moderating variable influences the impact and strength of the relationship between strategic approaches and project performance. Compliance with PD 1096 strengthens this relationship by promoting compliance to safety, health, and structural standards; standard design or details and construction practices; completion of inspections, regulatory approvals and permits; and protection of property, life, and the environment.

Overall assessment, the framework illustrates that strategic approaches in construction project management has a significant effect on project performance (time, cost, and quality), leading to improved general project performance outcomes, while compliance with PD 1096 moderates and strengthens this relationship.

Hyphothesis of The Study

This research study assumes that strategic approaches in construction project management and compliance with the National Building Code of the Philippines contribute have a substantial effect on improved project performance. Particularly, it examines project performance in terms of time, cost, and quality.

The study tests the following null hypotheses:

H_{01}: There is no significant relationship between strategic approaches to construction project management and project performance in terms of time, cost, and quality.

H_{02}: There is no significant relationship between compliance with the National Building Code of the Philippines and project performance in terms of time, cost, and quality.

Correspondingly, the alternative hypotheses are stated as follows:

H_{11}: There is a significant relationship between strategic approaches to construction project management and project performance in terms of time, cost, and quality.

H_{12}: There is a significant relationship between compliance with the National Building Code of the Philippines and project performance in terms of time, cost, and quality.

The hypotheses will be tested using data collected from construction professionals involved in project planning, project execution, project supervision, and quality management. Statistical tools, especially correlation analysis, will be used to find out if there is sufficient evidence to reject the null hypotheses and accept the alternate hypotheses. The results will provide insight into how much influence strategic project management approaches and compliance with regulatory requirements have on the successful implementation of construction projects.

RESEARCH METHODOLOGY

Introduction

This chapter consists of information, analysis, and interpretation based on participant surveys with construction professionals on strategic construction project management tools and practices and their importance in determining project progress (time, cost, quality) efficiency. The discussion is structured according to the research goals of the study.

The presentation starts with the age, gender, position, years of experience, and type of construction projects managed to be profiled on the respondents. Then, tables that present a summary of the outcomes in forms of reports on project management practices and project performance indicators are given in tables showing the views of the respondents on project management practices and the indicators of project performance.

In addition, the data are examined and interpreted in an interpretative manner to establish their extent of strategic project management practices and relationships with project performance. Findings are examined in the context of time, cost, and quality assessment results, as well as the perceived significance of complying with the National Building Code of the Philippines according to the standards of compliance.

In the overall chapter, we provide a systematic and clear presentation of survey results, and this serves as a basis for conclusions and considerations to be made in the next chapter on the basis for this research.

Research Design (Method and Techniques of The Study)

This research was a descriptive-survey research study looking at the strategic methodology of construction project management and its effect on time, cost, and quality performance. Descriptive research design is suitable for this study as it intends to systematically report on the actual activities of professionals working on construction, including their behaviors and attitudes to construction projects, without manipulating any of the variables.

Quantitative data were collected in the sample via the questionnaire. This method facilitated the researcher using standardized information on a relatively large population to analyze trends, patterns, and relationships between project management strategies and project performance indicators.

The design is cross-sectional, as only one point in time data was collected. This will allow the study to depict a snapshot of contemporary construction management practices and their performance in the attainment of the project outcomes of time, cost, and quality.

Respondents of The Study (Population)

The respondents of this analysis were professionals working in the construction and construction related area, including project managers, engineers, supervisors, contractors, consultants, and other relevant stakeholders involved in construction project management.

To create sufficient data for meaningful analysis, a target of 50 respondents was made for this research. The respondents come from different construction projects, residential, commercial, infrastructure, and industrial, in a defined geographic area.

The participants were selected based on their participation and experience in construction project management to provide reliable and relevant information about management practices and project performance.

Sampling Techniques (Sample of The Study)

This study employed a combination of purposive sampling and convenience sampling to select respondents. Purposive sampling was used because the study required participants who possessed relevant knowledge and professional experience in construction project management. Only individuals directly involved in planning, scheduling, resource allocation, risk management, communication management, and project execution were considered eligible. These included project managers, site engineers, civil engineers, contractors, consultants, and project supervisors. Selecting respondents with appropriate expertise ensured that the data collected were relevant, reliable, and capable of addressing the research objectives.

After identifying the target population through purposive sampling, convenience sampling was applied to recruit respondents who were readily accessible and willing to participate during the data collection period. This approach was chosen due to practical considerations, including limited time, accessibility to construction

professionals, and the availability of respondents across various construction projects. Convenience sampling enabled the researcher to efficiently collect data from qualified professionals while maintaining the study's inclusion criteria.

Participants were selected by contacting construction companies and professionals through professional networks, personal referrals, and direct visits to construction project sites. Individuals were first screened to confirm that they met the study's eligibility requirements. Respondents were included if they had direct involvement in construction project management and at least one year of professional experience in the construction industry. Those who did not meet these criteria or declined to participate were excluded from the study.

The combination of purposive and convenience sampling was considered appropriate because the study sought informed opinions from experienced construction professionals rather than to generalize findings to the entire construction industry. This sampling strategy increased the likelihood of obtaining valid and meaningful responses regarding the relationship between strategic project management practices and construction project performance.

Sample Size Determination

The sample size of 50 respondents was determined using Slovin's formula and validated by the rule of thumb in social science research, both widely accepted methods in determining sample adequacy.

Slovin's Formula (10% Margin of Error)

$$n = \frac{N}{1 + Ne^2}$$

Slovin's formula is for determining a sample size when the population is known or approximated and when a particular margin of error is desired.

Where:

n = sample size

N= total population

e = margin of error

The accessible population in this study is estimated to be around 100 construction professionals. The computation is presented in Figure 3 for a 10% margin of error (e = 0. 10):

$$n = \frac{100}{1 + 100(0.10)^2}$$

$$n = \frac{100}{1 + 100(0.01)}$$

$$n = \frac{100}{1 + 1}$$

$$n = \frac{100}{2}$$

$$\boxed{n = 50}$$

Hence, the computed sample size is 50 respondents.

For exploratory and descriptive survey research, a 10% margin of error is usually acceptable, particularly when the population size is not large and the objective is to determine general patterns and relationships rather than to

achieve high precision in estimates. This level of accuracy is typical of social science research where constraints of time, access, and resources are present.

Given the high specialization of the study and the limited availability of the target group, a margin of error of 10% was established to ensure its viability. By opting for a smaller, well-studied sample over a larger one, we preserve the internal validity of the data, ensuring that the insights reflect the group's unique expertise and not statistical noise. Such high recruitment targets can also lead to non-response bias in hard-to- reach communities, as the sample is biased towards only those who have time or willingness to participate. A 10% buffer was added to make the sample more naturally fair and to lessen the possibilities of self-selection bias.

Rule of Thumb in Social Science Research

The study is supported by the guidelines of research methodology as well as Slovin's formula. Creswell (2014) states that a sample size of 30 to 50 respondents is sufficient for a descriptive research design. Similarly, Uma Sekaran (2003) demonstrated that a sample of 30-500 is appropriate for most social science research depending on the nature and scope of the study.

The selection of 50 respondents is thus justified for the following reasons:

It is statistically generated using Slovin's formula with a margin of error of 10%

It falls within the range allowed by standards of social science research.

Suitable for descriptive-survey research with emphasis on trends and perceptions.

Ensures the feasibility of data collection, time, and resource availability.

It has sufficient data for significant analysis by frequency, percentage, and weighted mean.

Considering the above, the sample size of 50 respondents is adequate, reliable, and methodologically sound for the purpose of achieving the objectives of this study. The combination of Slovin's formula and the rule of thumb give both statistical and practical validation to ensure that the results are valid and applicable in the context of the construction project management.

Research Instruments

Instrument Development

The primary data collection tool used in this study was a structured survey questionnaire primarily adapted, and the others are being developed by the researcher.

The questionnaire was divided into several sections:

Section 0: Demographic Profile
Section 1: Project Management Practices
Section 2: Time Performance
Section 3: Cost Performance
Section 4: Quality Performance
Section 5: Overall Project Performance
Section 6: National Building Code of the Philippines

The survey utilized a four-point Likert scale for most sections to measure the level of implementation of management practices:

- Basic (1)
- Proactive (2)

- Comprehensive (3)
- Strategic (4)

For the National Building Code of the Philippines section, a five-point Likert scale was used:

- Strongly Agree – Very Strictly Implemented – Very High Impact (5)
- Agree – Strictly Implemented – High Impact (4)
- Neutral – Moderately Implemented – Moderate Impact (3)
- Disagree – Slightly Implemented – Low Impact (2)
- Strongly Disagree – Not Implemented – No Impact (1)

The questionnaire was designed to be clear, relevant, and aligned with the objectives of the study. It was also designed to collect both quantitative data and qualitative insights through optional open-ended questions.

Instrument Reliability

The reliability of the research instrument was tested to determine the consistency of the questionnaire in measuring the variables being studied. Reliability is the extent to which an instrument yields consistent and dependable results when measuring the same domain. Internal consistency of the questionnaire was measured by Cronbach's alpha coefficient. Cronbach's alpha is one of the most used measures of reliability, which is used to find out how closely related the items are within a particular construct.

The questionnaire consisted of five constructs, namely, project management practices, time performance, cost performance, Quality Performance and overall project performance. The responses obtained from the participants were encoded in Microsoft Excel/Spreadsheet, where required calculations were done using spreadsheet formulas. This computation involved the variance of each questionnaire item, the variance of the total scores for each construct, and the Cronbach's alpha formula to obtain the reliability coefficient for each section of the instrument.

The Cronbach's alpha coefficient was computed using the following formula:

$$\alpha = \frac{k}{k-1}\left(1 - \frac{\sum \sigma_i^2}{\sigma_T^2}\right)$$

where:

α = Cronbach's alpha coefficient

k = number of items in the construct

$\Sigma\sigma_i^2$= sum of the variances of the individual items

= variance of the total scores

Reliability coefficients were interpreted according to the generally accepted standards: a Cronbach's alpha value of 0.70 or higher was accepted as indicating acceptable internal consistency; values between 0.80 and 0.89, good reliability; and values of 0.90 or higher, excellent reliability (Nunnally, 1978). These criteria were used to assess the consistency of the questionnaire constructs with the intended concept. The computed Cronbach's alpha coefficients for each construct are presented and discussed in Chapters 4 and 5. The values of the coefficients provide evidence that the research instrument was reliable enough for the presentation, analysis, and interpretation of the data.

Data Gathering Procedure

The data gathering for this research study was strategically performed to ensure ethical compliance, accuracy, and consistency. The procedure involved several stages, including instrument adaptation, validation, administration, and data processing.

Research Instrument Design and Adaptation

The research instrument used in this study was a structured survey questionnaire. The questionnaire was modified from previous studies and presented conceptual frameworks in construction project management, particularly related to project performance (time, cost, and quality) and strategic management practices. The concepts and indicators were aligned with accepted standards such as those of the Project Management Institute (PMI) guidelines, relevant literature, and related studies in construction management.

The adaptation process involved modification of the survey instrument to suit the specific variables, objectives, and local context of the study. The questionnaire was customized to reflect construction processes in the Philippines, including the synthesis of provisions related to the National Building Code of the Philippines. Items were rephrased for relevance, clarity, and to match the respondents' level of comprehension.

Validation of the Research Instrument

To ensure the validity and consistency of the instrument, the questionnaire was subjected to validation by subject matter experts. The validation process was conducted only by professional civil engineers and non-civil engineering professionals due to the limited time available for this research. This approach was chosen to minimize any potential bias and ensure the objectivity and credibility of the validation results.

The research questionnaire's validation ratings and evaluation results are provided in Appendix B, and the instrument's validity is confirmed. The ratings indicate that the validators reviewed and judged the questionnaire to determine its validity and appropriateness for the study.

The validator reviewed the questionnaire based on the following criteria:

- Transparency of instructions and statements
- Relevance of indicators to the research objectives
- Suitability of the Likert scale
- Clear organization of sections
- Completeness of variables (planning, risk management, time, cost, quality, etc.)

Revisions were made based on the feedback of the validator to improve the overall quality of the instrument. Redundant or unclear items were refined or removed to ensure that each question accurately measured the intended variable.

Securing Permission and Ethical Considerations

Prior to data collection, the researcher secured permission from relevant construction professionals and organizations to conduct the survey. The researcher included a consent statement in the survey form placed before the questionnaire section and by answering the survey, respondents are already granting their permission. Respondents were also aware of the purpose of the research study, and the confidentiality of responses was guaranteed and used only for academic purposes Participation in the study was voluntary, and respondents were allowed to decline or withdraw at any time. No personal identifying information was required unless voluntarily provided.

Distribution of the Questionnaire

The validated questionnaire was distributed to the selected respondents using online and/or printed formats (if needed). Online distribution (e.g., Google Forms) was utilized to reach a wider group of respondents. A printed

questionnaire was also provided to the respondents, when necessary, if the target sample size of 50 participants could not be fully attained through the Google form survey. Clear instructions were given to help respondents answer the questionnaire, especially in understanding the Likert scale used to rate project management practices and performance.

Retrieval and Collection of Data

Respondents had time to complete the questionnaire. The researcher did follow-ups where necessary to obtain a higher response rate. The filled questionnaires were screened for completeness and then collected and systematically organized. Incomplete or inconsistent responses were carefully filtered out and removed from the analysis, if applicable, to maintain the integrity of the data.

Data Encoding and Organization

All collected data were encoded into a spreadsheet or excel for well-structured arrangements. Each response was given a corresponding numerical value according to the Likert scale used in the questionnaire.

Data Analysis

Data were encoded and analyzed using appropriate statistical tools such as frequency, percentage, and weighted mean. These techniques were used to determine the extent to which strategic approaches are implemented and their impact on project performance. In chapter 4, the results were interpreted and presented.

Through a clear process including adaptation, validation, ethical distribution, and systematic data handling, the study ensured that the data gathered were in line with the research goal, valid, and relevant. The use of validated and adapted instruments enhances the credibility and general quality of the research findings.

Data Processing And Statistical Treatment

The following statistical methods were used to evaluate the data collected from the respondents:

Frequency and Percentage

Frequency and percentage were used to summarize and describe the demographic profile of the respondents as well as the distribution of their responses in the survey questionnaire. Frequency refers to the number of times a specific response or category occurs, while percentage represents the proportion of respondents corresponding to a particular category relative to the total number of respondents. These statistical methods helped present the gathered data in an organized and interpretable manner. Frequency and percentage are commonly used in descriptive research as they provide a clear overview of the characteristics and patterns within the data set.

The percentage was computed using the formula:

$$Percentace = \frac{f}{N} x100$$

Where:

• f = frequency of response

• N = Total number of respondents

According to C.R. Kothari, frequency and percentage distributions are effective statistical tools for classifying, organizing, and interpreting quantitative data in survey research.

Weighted Mean

The weighted mean was used to determine the average responses of the participants regarding the strategic approaches in construction project management and their impact on project performance in terms of time, cost, and quality. This statistical tool allowed the researcher to measure the degree of agreement or assessment of the respondents based on the assigned weights in the Likert scale. The weighted mean is widely used in survey studies because it provides a more accurate representation of responses by considering the importance or weight of each category.

The weighted was computed using the formula:

$$\bar{x}_w = \frac{\sum fx}{\sum f}$$

Where:

$\sum$**fx** = Sum of the product of frequency and weight

- **N** = Total number of respondents
- **x** = Assigned weight or scale value

As stated by John W. Creswell, the weighted mean is appropriate in quantitative survey research for analyzing respondents' perceptions, evaluations, and attitudes using scaled responses.

The computed weighted mean was interpreted using the following scale:

For Management Practices

Weighted Mean	Interpretation
1.00–1.75	Basic
1.76–2.50	Proactive
2.51–3.25	Comprehensive
3.26–4.00	Strategic

For Agreement Scale

Weighted Mean	Interpretation
1.00–1.80	Strongly Disagree / Not Implemented / No Impact
1.81–2.60	Disagree / Slightly Implemented / Low Impact
2.61–3.40	Neutral / Moderately Implemented / Moderate Impact
3.41–4.20	Agree / Strictly Implemented / High Impact
4.21–5.00	Strongly Agree / Very Strictly Implemented / Very High Impact

Correlation Analysis

To further examine the relationship between strategic approaches in construction project management and project performance in terms of time, cost, and quality, the study employed correlation analysis using the Pearson Product-Moment Correlation Coefficient. This statistical method or tools was used to determine whether a significant relationship exists between the independent variables and dependent variables of the study.

Correlation analysis is a statistical method used to determine the strength and direction of the relationship between two continuous variables. In this study, it was utilized to assess whether improvements in project management practices are associated with better project outcomes in terms of schedule adherence, cost efficiency,

and quality performance. The Pearson Product-Moment Correlation Coefficient is appropriate for quantitative studies that aim to measure the degree of association between variables using numerical data.

The correlation was computed using the formula:

$$r = \frac{n\sum XY - (\sum X)(\sum Y)}{\sqrt{[n\sum X^2 - (\sum X)^2]\,[n\sum Y^2 - (\sum Y)^2]}}$$

Where:

• r = Pearson correlation coefficient

• X = Independent variable score

• Y = Dependent variable score

• N = Number of respondents

According to John W. Creswell, correlation analysis is commonly used in quantitative research to determine the extent of relationships among variables and to provide empirical evidence supporting or rejecting research hypotheses. Similarly, Frederick J. Gravetter and Larry B. Wallnau explained that the Pearson Product-Moment Correlation Coefficient measures both the strength and direction of linear relationships between variables in research studies. The following relationships were tested:

Strategic Approaches ↔ Time Performance

Strategic Approaches ↔ Cost Performance

Strategic Approaches ↔ Quality Performance

The responses obtained from the questionnaire were used to compute the weighted mean scores for each variable.

The strength of the relationship was interpreted using the following scale:

| Value of r | Interpretation

| ±0.90 – ±1.00 | Very Strong Relationship

| ±0.70 – ±0.89 | Strong Relationship

| ±0.40 – ±0.69 | Moderate Relationship

| ±0.20 – ±0.39 | Weak Relationship

A positive value of r indicates a direct relationship, i.e., better strategic approaches result in better project performance. "Negative" means an inverse relationship.

A level of significance of 0.05 ($\alpha = 0.05$) was used to establish the statistical significance of the observed relationships. If the calculated p-value is less than 0.05, the null hypothesis is rejected, suggesting a significant relationship between the variables.

The study identified and quantified the relationships between construction project management strategies and project performance outcomes through Pearson correlation analysis. This statistical tool supports the study's

objective of determining whether strategic approaches significantly influence time, cost, and quality performance.

Multiple Linear Regression Analysis

Multiple linear regression analysis was used to determine the extent to which the strategic approaches to construction project management predict and contribute to project performance in terms of time, cost, and quality. Correlation analysis only measures the strength and direction of the relationship between variables, whereas multiple linear regression determines the individual and combined influence of several independent variables on a dependent variable. This statistical technique enables the researcher to ascertain the significance of the impact of each strategic approach on project performance while controlling the effect of the other variables included in the model.

Independent variables were the strategic approaches to construction project management, which included project planning, risk management, use of modern methods and techniques, stakeholder communication and involvement, resource management, and continuous improvement through learning from past projects. The dependent variable was project performance that was measured in terms of time performance, cost performance, and quality performance. Multiple linear regression analysis was employed to examine the extent to which these strategic approaches contribute to improved project outcomes and to identify the management practices that are significant predictors of successful project performance.

The general multiple linear regression model is expressed as:

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + \varepsilon$$

Where:

- **Y** = Project Performance (Time, Cost, and Quality)
- $\boldsymbol{\beta_0}$ = Regression constant (intercept)
- $\boldsymbol{\beta_1}$–$\boldsymbol{\beta_6}$ = Regression coefficients representing the contribution of each independent variable
- $\mathbf{X_1}$ = Project Planning
- $\mathbf{X_2}$ = Risk Management
- $\mathbf{X_3}$ = Use of Modern Methods and Techniques
- $\mathbf{X_4}$ = Stakeholder Communication and Involvement
- $\mathbf{X_5}$ = Resource Management
- $\mathbf{X_6}$ = Continuous Improvement through Learning from Past Projects
- $\boldsymbol{\varepsilon}$ = Error term

The regression coefficients (β) were used to determine the magnitude and direction of the influence of each strategic approach on the project's performance. The positive coefficients of the regression indicate that an increase in the implementation of a certain strategic approach is associated with an improvement in project performance, and, on the other hand, a negative coefficient indicates an inverse relationship. The statistical significance of each predictor was determined by the corresponding t-test and p-value. A p-value of less than 0.05 was considered statistically significant for the estimated p-value.

The coefficient of determination (R^2) was also used to determine the extent to which variation in project performance could be accounted for by the combination of strategic approaches included in the regression model. A bigger R2 value implies that the independent variables explain a bigger part of the variability in project performance. The significance of the entire regression model was tested by the analysis of variance (ANOVA F-test) at the significance level $\alpha = 0.05$.

Multiple linear regression analysis is a good statistical technique in quantitative research to determine the predictive effect of two or more independent variables on a dependent variable (Creswell, John W.). Similarly, Frederick J. Gravetter and Larry B. Wallnau state that multiple regression analysis enables researchers to evaluate the contribution of each predictor variable independently, while controlling for the effects of the other independent variables, thus giving a more complete understanding of the factors that influence the outcome variable.

The study examined using multiple linear regression to the extent to which strategic approaches of construction project management contribute to project performance in terms of time, cost, and quality. The findings were used to identify strategic management practices that have the most significant impact on project success and to recommend management strategies to improve the performance of construction projects.

PRESENTATION, ANALYSIS, AND INTERPRETATION OF DATA

Introduction

This chapter describes, analyses and interprets data from fifty (50) construction professionals on the strategies employed in construction project management and their influence on project performance. Results are sorted according to the order of research queries presented in Chapter 1.

Before presenting the findings of the study, the reliability of the research instrument was assessed first by using Cronbach's alpha coefficient to determine the internal consistency of the questionnaire. Reliability analysis was performed for each construct of the instrument, which includes project management practices, time performance, cost performance, quality performance, and overall project performance. The reliability of the instrument was established to ensure the questionnaire consistently measured the intended constructs and that the collected data were appropriate for analysis and interpretation. The profile of the participants, the strategic techniques commonly adopted in construction project management, the degree to which these are applied and how much they affect project performance with respect to time, cost and quality, the perceived challenges experienced by construction professionals, and the contribution of the National Building Code of the Philippines to project performance improvement will be covered in this chapter. Moreover, the relationship between strategic project management practices and overall project performance is discussed.

Reliability Analysis of the Research Instrument

Reliability of the research instrument was measured before presenting and analyzing the data from the study using Cronbach's alpha to assess the internal consistency of the questionnaire items. A Cronbach's alpha coefficient of 0.70 or above was considered acceptable, which indicated that the instrument was reliable in measuring constructs included in the study.

Table 1:

Construct	No. Of Items	Cronbach's Alpha	Interpreter
Project Management practices	6	0.802	Good Reliability
Time performance	5	0.722	Accepted Reliability
Cost performance	5	0.782	Accepted Reliability
Quality performance	4	0.794	Accepted Reliability
Overall Project performance	4	0.897	Excellent Reliability

Analysis and Interpretation

Table 1. Reliability analysis of the research instrument using Cronbach's k coefficient. To assess the internal

consistency of the questionnaire items for each construct, reliability analysis was conducted. Internal consistency indicates the extent to which the items within a construct measure the same concept, and thus, the responses obtained from the participants are reliable and appropriate for statistical analysis.

The Project Management Practices construct had six (6) items in the questionnaire and obtained a Cronbach's alpha coefficient of 0.802. This value indicates good internal consistency, suggesting that the items included in this construct measure project management practices in a consistent way. The result indicates the close relationship between the statements and gives reliable information on the perceptions of the respondents on project management practices.

The construct of time performance with five (5) items obtained a Cronbach's alpha coefficient of 0.722, which is acceptable. This is lower than the other constructs but above the recommended minimum threshold of 0.70. This suggests that the questionnaire items are consistently measuring project time performance and are reliable for measuring respondents' perceptions of timely project completion and schedule adherence.

Similarly, the Cost Performance construct with five (5) items had a Cronbach's alpha coefficient of 0.782, indicating acceptable internal consistency. This result indicates that the items used to measure project cost performance are sufficiently correlated and measure the intended construct reliably. Accordingly, the responses of this section can be considered reliable for subsequent analyses. So, the responses obtained in this section can be considered reliable for further analysis.

The construct of Quality Performance, which has 4 items, has a Cronbach's alpha coefficient of 0.794, which is also an acceptable reliability. The coefficient indicates the trustworthiness of the questionnaire items in measuring quality-related aspects of project performance and in generating reliable data for the study. The construct of Quality Performance, with four (4) items, has a Cronbach's alpha coefficient of 0.794. This also shows acceptable reliability. The coefficient shows that the questionnaire items are consistent in measuring the quality-related aspects of project performance and providing reliable data for the study.

The Overall Project Performance construct reached the highest Cronbach's alpha coefficient (0.897), showing good to excellent internal consistency. This finding indicates that the items in this construct are highly inter-correlated and measure the overall performance of construction projects consistently. The high reliability coefficient indicates that the respondents answered these items consistently, which increases the credibility of the gathered data.

The results of the reliability analysis in general showed that the five constructs achieved Cronbach's alpha coefficients higher than the widely accepted lower limit of 0.70. The findings show that the research instrument has good internal consistency and is reliable in measuring the variables in the study. Thus, the questionnaire is an adequate instrument for the presentation, analysis, and interpretation of the data, and the answers obtained from the participants are suitable for further descriptive and inferential statistical analyses.

Demographic Profile of the Respondents

A demographic profile of respondents was looked at to clarify the features of the respondents that were part of this study. To ascertain the respondents' professional background, information including age, sex, position or role, years of experience, and type of construction project handled was collected. Such features are important since they may impact respondents' attitudes toward construction project management practices and project performance.

Table 2:

Variables	Category	Frequency (N=50)	Percentage %
Age	18-25	11	22%

	26-35	27	54%
	36-45	6	12%
	46-55	6	12%
Gender	Male	30	60%
	Female	19	38%
	Prefer not to say	1	2%
Work Position or Role	Construction Manger	2	4%
	Construction Supervisor	2	4%
	Consultant	2	4%
	Contract Engineer	1	2%
	Design Engineer/ Architect	2	4%
	Documentation Controller	1	2%
	Office Engineer	4	8%
	Planning Engineer/ Scheduler	1	2%
	Project Manager	1	2%
	Project Engineer	1	2%
	QA/QC Engineer	7	14%
	Quantity Surveyor	1	2%
	Site Engineer	25	50%
Years of experience	1-3 years	12	24%
	4-7 years	19	38%
	8-10 years	5	10%
	Less than 1 year	6	12%
	More than 10 years	8	16%
Type of Construction project handle	Commercial	6	12%
	Industrial	9	18%
	Infrastructure	28	56%
	Others	2	4%
	Residential	5	10%

Analysis and Interpretation

The majority of participants (54%) belonged to the age group of 26-35 years of age, and 18-25 years of age (22%) were the other age groups mentioned in the survey. Respondents aged 36-45 years and 46-55 years were also present in the sample — both made up 12%. We know from this that the majority of respondents are young and middle-working-age people who are getting the most involvement in construction project work and are up to date with the industry.

On the basis of sex, 60 per cent were male, 38 per cent were female, whereas 2 per cent didn't want to admit their gender. The results speak to the male dominated nature of the construction industry, despite seeing a growing number of female professionals in the construction industry.

As for working positions that have the highest percentage of site engineers (50%), followed by QA / QC engineers (14%) and Office Engineers (8%). The rest of the respondents had more technical and managerial roles. The distribution of data shows that the respondents were predominantly professionals from the sector who were working on project implementation and quality assurance, thus making their conclusions relevant in construction project management practices.

For years of experience, 38% had 4–7 years of experience and 24% had 1–3 years; 16% of the sample were people with more than 10 years of work experience. This implies that most people have experienced enough in the work context to properly measure project strategies and project success.

Last but not least; Infrastructure projects (56%) which were the ones most respondents managed followed by Industrial projects (18%), Commercial projects (12%) and Residential projects (10%). Its findings show that the majority of respondents' experience is related to infrastructure development, which is one of the major sectors of construction.

Level of Implementation of Strategic Approaches to Construction Project Management

Key construction project management strategy approaches are used to make sure the construction can be performed effectively, thus having better outcomes. The following section shows the degree of implementation of strategic management practices according to the respondents: project planning, risk management, applying modern methods and techniques, stakeholder communication and involvement, resource management, and continuous improvement through learning from past projects. The results of this study elucidate the degree to which this is being utilized throughout construction firms.

Table 3:

Indicators	Weighted mean	Verbal interpretation
Project planning	3.02	Comprehensive
Risk management	2.96	Comprehensive
Use of modern methods and techniques	2.90	Comprehensive
Stakeholder communication and involvement	2.80	Comprehensive
Resource management	2.90	Comprehensive
Learning from past projects	2.94	Comprehensive
Grand mean	**2.92**	**Comprehensive**

Analysis and Interpretation

Table 3, shows the extent of application of strategic construction project management techniques. The joint grand mean of 2.92, which is also interpreted as Comprehensive, indicated that the construction organizations who participated in the analysis adopted strategic management tools that were implemented in the activities of the project. These findings indicate that project management strategies are introduced as part of organization work that is aimed at enhancing the performance and effectiveness of the project. Of the indicators,

Project Planning had the highest weighted mean of 3.02 followed by Risk Management with a final average score of 2.96 and learning from past projects with 2.94. These results also illustrate the importance organizations attach to effective planning, spotting potential risks related to the project and learning from previous projects. Planning and risk management are important to control uncertainty and project effectiveness. Another more comprehensive evaluation was given to the indicators Use of Modern Methods and Techniques (2.90) and Resource Management (2.90), confirming that organizations are employing modern management tools and are devoting resources for project implementation successfully. In one indicator, Stakeholder Communication and Involvement (2.80) had the lowest mean among the indicators and is still in the Comprehensive category. Thus, although communication is effective overall, the engagement of stakeholders during the implementation of a project is still lacking.

In general, the results suggest that construction agencies are aware of strategic management and that effective strategic management can be used frequently and, in a project, -oriented way. It will all be better decision-making, optimized access to resources, and project control throughout the project through the holistic adoption of these aspects.

Level of Project Performance in Terms of Time, Cost, and Quality

The performance of construction projects is an important measure of success. It is commonly defined as the extent to which the project can meet schedule requirements, maintain a budget, or meet quality standards that are defined for the delivery of the required deliverable. This section reflects the respondents' perceptions of project performance, focusing on time, cost, and quality. Those results reflect the extent to which construction projects are managed and performed according to these critical performance dimensions.

Table 4: Time Performance

Indicators	Weighted mean	Verbal interpretation
Effective of planning in meeting deadlines	2.92	Comprehensive
Effectiveness of scheduling methods in reducing delays	2.72	Comprehensive
Effectiveness of risk management in preventing delays	2.66	Comprehensive
Communication in maintaining project schedule	2.66	Comprehensive
Response to delays	2.78	Comprehensive
Grand mean	**2.75**	**Comprehensive**

Analysis and Interpretation

Table 4, depicts the project performance level. Overall, a grand mean of 2.75 (Comprehensive); respondents generally consider their organizations' performance in managing project schedules and meeting project deadlines.

Of the different indicators, Effectiveness of Planning in Meeting Deadlines scored high at 2.92, demonstrating how planning is vital in planning and how time efficiency contributes to reaching time deadlines for projects. This analysis concludes that companies with good systems of planning tend to have less time management issues, and delays are less likely as a result.

Organizations can handle project delays and thus can not only manage project schedules but maintain schedules on time (Response to Delays: 2.78, Effectiveness of Scheduling Methods: 2.72). Moreover, Risk Management (2.66) and Communication in Maintaining Project Schedule (2.66) also reveal that a proactive attitude towards risks and good communication are essential aspects of successful time management.

Overall, the results indicate that strategic management enhances Schedule Performance. From an organizational perspective, project managers see that construction companies seem able to develop plans and to plan/schedule communication to have a say on the date and timing of projects.

Table 5: Cost Performance

Indicators	Weighted mean	Verbal interpretation
Effectiveness of cost control	2.64	Comprehensive
Precision of cost estimation	2.82	Comprehensive
Planning to mitigate unnecessary costs	2.90	Comprehensive
Risk management for cost prevention	2.90	Comprehensive
Monitoring project financials	2.84	Comprehensive
Grand mean	**2.82**	**Comprehensive**

Analysis and Interpretation.

Table 5. indicates project performance level against the cost. The aggregate grand mean of 2.82 is interpreted as Comprehensive; thus, respondents believe that their companies are effective in managing the project budgets and controlling expenditures.

Of these indicators, Planning to Mitigate Unnecessary Costs (2.90) and Risk Management for Cost Prevention (2.90) had the highest weighted mean. This indicates that organizations depend significantly on planning and risk management to be able to mitigate cost overruns and eliminate unnecessary expenses when building out projects.

Relatedly, both Monitoring Project Financials (2.84) and Precision of Cost Estimation (2.82) also received a comprehensive rating indicating an emphasis on monitoring of project finances and correct costing. All this assists' organizations in controlling their budgets and increasing the financial performance. Effectiveness of Cost Control (2.64) was found to have the lowest weighted mean among indicators but also contained a portion of Comprehensive. Organizations tend to provide good level cost control, and yet there is evidence to indicate other measures can add to enhance a budgetary management system. This demonstrates that strategic project management enhances the cost performance of construction projects and financial sustainability of projects.

Table 6: Quality Performance

Indicators	Weighted mean	Verbal interpretation
Management approach in improving quality	2.86	Comprehensive
Frequency of quality checks	2.92	Comprehensive
Use of technology to improve quality	3.00	Comprehensive
Compliance with standards	3.14	Comprehensive
Grand mean	**2.98**	**Comprehensive**

Analysis and Interpretation.

Table 6, shows the project level in quality. According to the overall mean of 2.98, which is considered comprehensive, construction companies are strongly focused on the quality standard and satisfactory project output. Of the factors which were scored, Compliance with Standards (3.14) was ranked as the best weighting indicator, meaning that organizations tend to uphold the standard measures, specifications, rules, and protocols.

This demonstrates a very high level of dedication towards guaranteeing the quality and credibility of construction projects. In this context, the indicator Use of Technology to Improve Quality (3.00) scored similarly high, reflecting the fact that organizations are using better tools and technologies to elevate project quality ever more. Similarly, Frequency of Quality Checks (2.92) and Management Approach in Improving Quality (2.86) are equally important aspects which further substantiate the notion that continuous checking of the quality and systems management for enhancement and management practices ensure quality assurance. This paper indicated that one area of focus of construction bodies is quality management. Routine inspections,

using quality management tools and high technical innovation, and ensuring compliance with standards help maintain high-quality outputs as well as improve client satisfaction.

Extent of Contribution of Strategic Approaches to Overall Project Success

Success of construction projects has much to do with the effective management throughout their lifecycle. Strategic management methods (e.g: planning, risk management, communication, resource allocation, and continuous improvement) are anticipated to increase the likelihood of favorable project outcomes. In this part, we plan to understand the contribution these strategic approaches make to total project achievement, especially toward favorable project results in time, cost, and quality performance.

Table 7:

Indicators	Weighted mean	Verbal interpretation
Overall effectiveness of management approach	2.84	Comprehensive
Impact on time, cost, and quality	2.94	Comprehensive
Ability to balance time, cost and quality	2.74	Comprehensive
Competitive advantage of management approach	2.78	Comprehensive
Grand mean	**2.82**	**Comprehensive**

Analysis and Interpretation

Table 7. illustrates to what extent strategic approaches drive overall project success. A mean of 2.82, interpreted as Comprehensive, reflects that strategic project management practices are heavily involved in project outcomes.

Out of all the indicators, Impact on Time, Cost, and Quality (2.94) had the highest weighted mean reflecting the general belief that strategic approaches improve the three main dimensions of project performance. This result emphasizes the need to use structured management practices from start to finish of the project.

Moreover, the score of Overall Effectiveness of Management Approach (2.84) shows that project management strategies positively affect successful project completion. Both Competitive Advantage (2.78) and Ability to Balance Time, Cost, and Quality (2.74) reveal that organizations derive benefit from long term strategic thinking through higher operational efficiency and improved project performance.

These findings suggest that when done in a systematic way, strategic project management practices are very important tools in the project success toolbox and the organization's competitive advantage in the case of construction firms

Relationship Between Strategic Project Management Approaches and Project Performance

The implementation of strategic project management techniques aims to enhance both the efficiency and effectives of projects. If successful, their effectiveness will affect schedule tracking, budget monitoring, and quality in turn affecting the project delivery. This portion examines the role of level of use of strategic PM (strategic project management) interventions on project performance. The key findings contribute to whether better implementation of management strategies is linked to better project outcomes.

Variables

Independent Variable (X): Strategic Approaches

- Project Planning
- Risk Management
- Use of Modern Methods and Techniques

- Stakeholder Communication and Involvement
- Resource Management
- Learning from Past Projects

Dependent Variable (Y): Project Performance

- Time Performance
- Cost Performance
- Quality Performance

Table 8:

Symbols	Value
N	50
$\sum X$	142.8333
$\sum Y$	140.7143
$\sum X^2$	431.0278
$\sum Y^2$	415.8776
$\sum XY$	418.8571

Computation for r-value

Step 1: Substitute the Values

Step 2: Solve the Numerator

Step 3: Solve the First Denominator Component

Step 4: Solve the Second Denominator Component

Step 5: Solve the Denominator

Step 6: Compute r

Computation for p-value

Step 1: Compute the t-value

Substitute the values:

Step 2: Compute the Degrees of Freedom

Step 3: Use the t-table

Look at the row:

- Degrees of freedom = 48
- t-value = 8.93

p-value = 0.000 < 0.05

The p-value was calculated using an online calculator.

Final Results

Variables	r-value.	p-value.	Interpretation
Strategic Approaches and Project Performance	0.790	0.00	Strong positive relationship

Decision

Since the p-value (0.00) is less than the 0.05 level of significance:

Reject the Null Hypothesis (Ho).

Interpretation

The statistical value of the Pearson correlation coefficient (0.79) indicated that the relationship between the implementation of the strategic measures and the performance of the project was very high. This implies that as the construction company gets better in project planning, risk management, communication, resource management, modern methods, and continuous improvement, project performance in terms of time, cost, and quality also tends to improve.

A p-value of 0.00 suggests that the relationship is statistically significant. In other words, strategic construction project management greatly impacts the performance of the project

Level of Compliance with the National Building Code of the Philippines

To assure safety, construction works are of quality, efficient and conform with the regulatory requirement, compliance with the National Building Code of the Philippines is paramount. The Code provides construction management practices as a framework for guidance and ensures that construction meets the standards and the law. In this section, I examine the degree of compliance with the criteria of construction management based on the National Building Code as perceived by the respondents.

Table No. 9: Agreement on strict compliance with the National Building Code

Indicators	Weighted mean	Verbal interpretation
Alignment of construction Management practices with the national building code	4.48	Strongly Agree

Table No. 10: Compliance level

Indicator	Weighted mean	Verbal interpretation
Compliance with the national building code	3.80	Strictly Implemented

Table No. 11: Impact on Project Performance

Indicators	Weighted mean	Verbal interpretation
Impact on time performance	4.12	High impact
Impact on cost control	4.22	High impact
Impact on quality performance	4.44	Very High impact

The results show that respondents strongly agree (WM = 4.48) that construction management practices need to be in line with the National Building Code of the Philippines. This result indicates that regulatory compliance is a strong requirement for safe, efficient, and quality construction project execution.

The compliance level was a weighted mean of 3.80 and is viewed as Strictly Implemented. This means most

construction companies were aware and implemented the National Building Code when making a project and then executing it. Most projects are thus compliant with the law and technical standards.

According to each project, compliance with the National Building Code has a high impact on time performance (WM = 4.12) and cost control (WM = 4.22) while demonstrating a very high impact on quality performance (WM = 4.44). This indicates that the implementation of the Code is a major factor in project performance in terms of quality and regulatory requirements.

Taken together, the findings indicate that compliance with the National Building Code of the Philippines is very important for overall project performance. It is likely that well-organized construction organizations that can adhere to code requirements will improve time, cost, and quality performance.

Relationship Between Compliance with the National Building Code and Project Performance

Compliance is one of the key factors in project success. Adherence to the National Building Code of the Philippines can lead to better project performance in terms of project planning, quality assurance, and project control. This section discusses the relationship of the National Building Code with project delivery time, cost, and quality, and regulatory compliance, the results of which are important for project delivery.

Variables

Independent Variable (X):

Compliance with the National Building Code of the Philippines

Dependent Variable (Y):

Project Performance

Table No. 12:

Symbols	Value
N	50
∑X	185.00
∑Y	213
$\sum X^2$	696.111111
$\sum Y^2$	922.111111
∑XY	795.6666667

Step 1: Substitute the Values

Step 2: Solve the Numerator

Step 3: Solve the First Denominator Component

Step 4: Solve the Second Denominator Component

Step 5: Solve the Denominator

Step 6: Compute r

Computation for p-value

Step 1: Substitute the Values

Using:

- Degrees of freedom = 48
- t-value = 4.92

p-value = 0.001 < 0.05

The p-value was determined through the use of an online calculator.

Final Results

Variables r-value p-value

Interpretation

Variables	r-value	p-value	Interpretation
NBCP Compliance and Project Performance	0.579	0.001	Moderate Positive Relationship

Decision

Since the computed p-value = 0.001 (which is below the threshold of 0.05:

Reject the Null Hypothesis (H_{02}).

Interpretation

The Pearson correlation coefficient of 0.579 shows a moderate positive relationship between compliance with the National Building Code of the Philippines and project performance. This implies that as you comply with the National Building Code, time, cost, and quality of the project will also improve.

Since the significance value computed is less than the 0.05 level of significance, we reject the null hypothesis. Therefore, there is a significant relationship between compliance with the National Building Code of the Philippines and project performance.

Factors Contributing to the Success of a Construction Project

In order to understand the factors that impact success in the construction project implementation, we asked the respondents an open-ended question about what is most important to the project success. This question provided the opportunity to hear from construction professionals about project development and the project results outside of the structured surveys. We grouped the responses into common themes for the factors that influence project performance in terms of time, cost, and quality.

Table No. 13

Theme/Factor	Representative Responses	Frequency (f)
Planning and Scheduling	Proper planning, comprehensive planning, strategic planning, implementation and scheduling, realistic scheduling, clear planning and scope definition, advanced planning and preparation	11
Project Management and Supervision	Proactive oversight, Administration and financial planning, Effective supervision and leadership, Construction oversight, Robust project management, Skilled project administration, Management governance	9

Communication and Teamwork	Teamwork, communication among engineers, effective communication, collaboration within the company, team effort	6
Cost Management and Budget Control	Management and budget, cost control, budget control, project budget, cost estimate, overall project cost monitoring	6
Quality Control and Assurance	Quality, quality output, quality control, assuring quality standards	4
Resource and Workforce Management	Manpower management, resource utilization, experienced and skilled personnel	3

Analysis and Interpretation

Table 13, presents the factors that the respondents identified as important to the success of construction projects. Planning and Scheduling (f = 11) was the most frequently mentioned factor, and it indicates that project completion requires planning ahead of time, and that realistic planning is essential. It means that projects can achieve their objectives if the activities are planned and organized from the very beginning.

The second most frequent factor was Project Management and Supervision (f = 9). Respondents also stressed that proactive management, leadership, supervision, and decision-making are very important. This finding highlights the importance of project managers in getting the resources together and the projects to be accomplished as well as the need for an efficient execution of the project.

Communication and collaboration (f = 6) and cost management and budget oversight (f = 6) were most highlighted. These observations show that good cooperation among project stakeholders, as well as good financial management, will be essential to avoid conflicts, delays, and overspending on projects.

Quality control and assurance (f = 4) and resource and workforce management (f = 3) are key to the success of projects. Quality and skilled personnel are critical to achieving project objectives and to ensuring client satisfaction, respondents said.

Planning and scheduling and project management and supervision are considered to be the three most important components of the construction project success factors. These results indicate that a well-managed project with good management and good communication, financial control, quality assurance and appropriate resource utilization will lead to a better probability of completion of projects on time, on budget and in line with the required quality standards.

Common Challenges Encountered in Managing Construction Projects

In this section, we describe the common challenges experienced by respondents in managing construction projects. The question was optional, and respondents could freely comment on the problems they encounter when implementing a project. We grouped the responses into common themes to identify the most common challenges to the execution of construction projects. In doing so, we can gain a better understanding of the actual challenges associated with project scheduling, budgeting, communication, manpower, and other factors that affect the successful completion of construction projects.

Table No: 14

Theme/Factor	Representative Responses	Frequency (f)
Project Delays and Scheduling Issues	Postponements, delaying of project plans, Slow replies from agencies, delayed schedules, Concerns regarding project duration, Delays attributed to lack of materials, unexpected obstacles leading to setbacks, Abrupt alterations in turnover or opening timelines, Project holdups	10

Budget Constraints and Cost Overruns	Financial constraints, Inadequate funding, Exceeding budget limits, Cost discrepancies, Economic variability, Issues related to project finances, Unforeseen changes impacting expenses	8
Communication and Coordination Problems	Challenges in coordination, Ineffective communication, Insufficient information exchange, Subpar interface quality, Inadequate coordination efforts, Clients not adhering to strategic advice	6
Unforeseen Risks and External Factors	Unexpected occurrences, Unanticipated risks, Climatic factors, Supplier-related complications, Site-specific challenges, Concealed utilities, Restrictions on access.	5
Manpower and Workforce Issues	Single individual managing all tasks, Workforce challenges, Untrustworthy personnel, Site-related issues, Concealed utilities, Restricted access	4
Poor Management and Supervision	Bad subcontractor practices, poor management, lack of supervisor responsibility, lack of supervision	4
Material Supply and Procurement Issues	Delay of materials, insufficient material supply, supplier related problems	3
Quality and Safety Concerns	Maintaining quality work, inconsistent workmanship, safety and security implementation, unsafe work practices	3
Scope Changes and Design Revisions	Unexpected modifications to the project, Alterations in turnover specifications, Concerns related to shop drawings and submittals	2

Analysis and Interpretation

The project delays and scheduling were the most common issues encountered by the most respondents, and 10 respondents noted that project delays were a major challenge in project management. This results in delays due to delays in project approval, lack of materials, schedule disruptions, and unexpected circumstances. This shows that project timeliness is still a big problem for construction professionals.

The second most common issue was budget constraints and cost overruns, which 8 of the respondents described most. The budget constraints, increased costs, economic fluctuations, and unexpected expenses in the project were the participants' biggest challenges. This shows that financial management is still an important aspect of project success, since an insufficient budget in the project implementation and completion is crucial.

Communication and coordination were ranked third with 6 respondents noting poor communication, poor coordination, and lack of information sharing among project stakeholders. These issues can cause confusion and delays in project implementation, and loss of efficiency.

Unforeseen risks and external factors were also mentioned by 5 respondents. These include, for example, bad weather conditions, supplier issues, hidden site conditions, and other unusual events. As a result, risk assessment and contingency planning are important in construction projects.

Manpower and workforce issues and poor management and supervision were also identified by 4 respondents. Labor shortages, unreliable workers, inadequate supervision, and poor resource management are factors that negatively affect productivity and project performance.

Finally, material supply and procurement issues and quality and safety issues were mentioned by 3 respondents, and scope changes and design revisions were identified by 2 respondents. These challenges are not reported more often, but they can have a significant impact on project outcomes if not handled properly.

In general, the findings indicate time management, budget control, and communication issues among construction project managers are the main challenges. Strategic planning coordinated strategies to ensure the

project will be successful, as well as proactive risk management can improve project performance and project completion.

Recommended Improvements to Enhance Project Performance in Terms of Time, Cost, and Quality

The responses to the optional open-ended questions in the survey are reported next. These questions were asked in order to gain further insights and recommendations from construction professionals in terms of how to enhance project performance in terms of time, cost and quality, as well as possible improvements to the National Building Code of the Philippines. The responses were analyzed using thematic analysis to identify common themes and recurring suggestions from the participants.

Table No. 15

Theme	Respondent's Responses	Frequency (f)
Planning and Scheduling Improvement	Strategic planning, comprehensive planning, planning strict adherence to schedules. Gantt chart monitoring, project timeline compliance, and construction scheduling	8
Communication and Coordination	Proper coordination, communication, cooperation, better collaboration, improved coordination and communication system	7
Project Management and Monitoring	Strict management, proper project management, general monitoring templates, detailed data gathering and monitoring, command and supervision	6
Technology and Digitalization	BIM, engineering software, scheduling software, estimation software, time tracking software, digital tools, real time cost tracking	6
Cost Control and Resource Management	Verification of cost estimates, Monitoring of expenses, Efficient use of resources, Management of budgets, Minimization of material waste	5
Quality Assurance and rework prevention	Adherence to regulations, Improvement of performance quality, Quality assessment, Minimizing rework, com patent workforce	5

Analysis and Interpretation

Planning and scheduling improvement (f = 8) is the most frequently recommended strategy for project performance. The respondents reported a strong emphasis on planning, complying with project schedules, as well as the use of Gantt charts and other scheduling tools for project management to avoid delays and improve project performance.

The second most common theme was communication and coordination (f = 7). We were told that effective communication of project stakeholders leads to smooth project execution, quicker decision-making, and less misunderstanding, which can lead to delays and additional costs.

Project management and monitoring (f = 6) and technology and digitalization (f = 6) were also significant factors. As a result of strict management processes, continuous monitoring and the incorporation of new technologies such as BIM, scheduling software and real-time cost tracking systems were recognized by respondents that would contribute to project efficiency and accuracy.

In addition, cost control and resource management (f = 5) and quality assurance and rework prevention (f = 5) were frequently mentioned. These findings demonstrate that the effective management of resources, continuous quality monitoring, and minimizing rework are important to achieve project objectives including time, cost, and quality performance.

The responses show that construction professionals consider that good planning, communication, management practices, and technology adoption are at the heart of construction project performance in general.

Table No. 16

Theme	Respondent's Responses	Frequency (f)
Stronger Implementation and Accountability	Strict implementation, more severe consequence, upgraded monitoring system, Increased responsibility, Professional accountability	6
Project Management Requirements	CPM code, standardized project management plans, pre-construction planning, scheduling and monitoring requirements	5
Digital Transformation and BIM Integration	Implementation of Building Information Modeling (BIM), Online permit processing systems, digital transformation	4
Disaster Resilience and Climate Adaptation	Climate change adaptation, updated seismic standards, earthquake, flood, landslide, and typhoon resilience	4
Professional Development and Competency	Professional competitiveness, quality standards adaptation, professional accountability	2
No Additional	N/A, none	3

Analysis and Interpretation

The report also shows that stronger implementation and accountability measures (f = 6) were the most common recommendations to improve the National Building Code of the Philippines. The respondents pointed out that regulations already must be stricter, and inspection systems must be better, and project owners, professionals and government bodies should be more accountable.

The second most frequently mentioned theme was project management requirements (f = 5). Some of the authors suggested incorporating construction project management principles into the code including mandatory project planning, scheduling, monitoring, and development of standardized project management plans for medium and large-scale projects.

Digital transformation and BIM integration (f = 4) and disaster resilience and climate adaptation (f = 4) were also commonly recommended. The respondents suggested that modern digital technologies and modern construction standards need to be developed to address the Philippines vulnerability to natural hazards like earthquakes, typhoons, floods, and landslides.

A smaller number of participants mentioned professional development and competency (f = 2) as a point of improvement, suggesting that professional standards and competitiveness are higher and more competitive among construction experts. Three respondents did not make any recommendations (N/A or none).

Overall, the responses show that construction professionals want stronger enforcement mechanisms, project management practices integrated with digital technology, and disaster-resilient construction management standards adopted to enhance the Philippines construction management practices.

XII Multiple Regression Analysis of Strategic Approaches on Overall Construction Project Performance

The extent to which strategic approaches in construction project management impact overall construction project performance was investigated using multiple regression analysis. In particular, the analysis looked at the predictive effects of six strategic approaches on overall project performance, including project planning, project scheduling, risk management, resource allocation, communication management, and monitoring and control. Multiple regression was chosen because it can test the effects of several independent variables individually and collectively on one dependent variable at the same time. The results contain information regarding the overall significance of the regression model, the percentage of variance in project performance explained by the strategic approaches (R^2), and the statistical significance of each strategic approach in predicting construction project performance. The results are shown in Tables 17, 18 and 19.

Table 17. Regression Statistic

Regression Statistics	
Multiple R	0.820907226
R Square	0.673888673
Adjusted R Square	0.628384767
Standard Error	0.435038308
Observations	50

Table 18. ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	6	16.81689184	2.802815307	14.80946871	4.31939E-09
Residual	43	8.13810816	0.189258329		
Total	49	24.955			

Table 19. Coefficient

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.6444133	0.2795607	2.3050926	0.0260518	0.0806254	1.2082012	0.0806254	1.2082012
SA1	0.4037754	0.0940457	4.2933947	9.834E-05	0.2141141	0.5934366	0.2141141	0.5934366
SA2	0.0423653	0.1376405	0.3077966	0.7597231	-0.235213	0.3199438	-0.235213	0.3199438
SA3	0.1624909	0.0934682	1.7384632	0.0892858	-0.026006	0.3509874	-0.026006	0.3509874
SA4	0.2200012	0.1151727	1.9101857	0.0627934	-0.012267	0.452269	-0.012267	0.452269
SA5	0.0498637	0.1015467	0.4910415	0.625894	-0.154925	0.2546522	-0.154925	0.2546522
SA6	-0.068079	0.1194351	-0.570009	0.5716378	-0.308943	0.1727848	-0.308943	0.1727848

Analysis and Interpretation

To determine the effect of strategic approaches in construction project management on overall project performance, multiple regression analysis was conducted. The R^2 value obtained from the regression model is 0.674. This means that the six strategic management approaches included in the model explained about 67.4% of the variation in the overall construction project performance. The rest, 32.6%, may be due to other factors not considered in this study. The overall regression model was statistically significant ($F = 14.809$, $p < 0.001$). This indicates that strategic approaches together have a significant effect on construction project performance.

Among the six strategic approaches, only Project Planning (SA1) was a significant predictor of project performance ($\beta = 0.404$, $t = 4.293$, $p < 0.001$). This means that project planning improvement can make a great contribution to the overall performance of construction projects. Specifically, a one-unit increase in project planning is associated with a 0.404-unit increase in overall project performance, holding other factors constant.

On the other hand, Project Scheduling (SA2), Risk Management (SA3), Resource Allocation (SA4),

Communication Management (SA5) and Monitoring and Control (SA6) did not significantly predict project performance as their respective p-values were higher than the 0.05 level of statistical significance. Risk Management and Resource Allocation had positive coefficients, but their impact was not statistically significant in this study.

In summary, the results reveal that strategic approaches have a joint effect on construction project performance, but effective project planning is identified as the main strategic factor that significantly improves successful project delivery.

XIII Multiple Regression Analysis Showing the Impact of Strategic Approaches in Construction Project Management on Time Performance

Tables 20, 21 and 22. Illustrate the results of the multiple regression analysis done to determine the effect of strategic approaches in construction project management on overall construction time performance. Specifically, the analysis examined whether the six strategic approaches (i.e., project planning, project scheduling, risk management, resource allocation, communication management, and monitoring and control) significantly predict the time performance of construction projects. The overall significance of the regression model and the individual contribution of each of the strategic approaches to the time performance of the project were tested using multiple regression analysis.

Table 20. Regression Statistic

Regression Statistics	
Multiple R	0.829890896
R Square	0.688718899
Adjusted R Square	0.645284327
Standard Error	0.409028337
Observations	50

Table 21. ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	6	15.91712022	2.652853371	15.85646789	1.65393E-09
Residual	43	7.194079775	0.167304181		
Total	49	23.1112			

Table 22. Coefficient

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.746240394	0.262846394	2.839074116	0.00688176	0.216160121	1.276320666	0.216160121	1.276320666
SA1	0.121490623	0.088422931	1.373971913	0.176570644	-0.056831211	0.299812458	-0.056831211	0.299812458
SA2	0.246370852	0.1294113	1.903781594	0.063644864	-0.014611908	0.507353611	-0.014611908	0.507353611
SA3	0.432097514	0.087879899	4.916909563	1.32824E-05	0.254870808	0.609324221	0.254870808	0.609324221
SA4	-0.044013371	0.108286759	-0.40645201	0.686426411	-0.262394434	0.174367692	-0.262394434	0.174367692

SA5	-0.107807765	0.095475483	-1.129166997	0.26508754	-0.300352427	0.084736898	-0.300352427	0.084736898
SA6	0.034973969	0.11229436	0.311449024	0.756964319	-0.191489192	0.26143713	-0.191489192	0.26143713

Analysis and Interpretation

All tables present the results of multiple regression analysis on the effects of strategic approaches of construction project management on time performance. The multiple R value for the regression model was 0.830, indicating a strong positive relationship between strategic approaches and time performance. The R^2 value of 0.689 indicates that the six strategic approaches incorporated into the model account for 68.9% of the variance in time performance, while the remaining 31.1% is attributed to other factors not discussed in this study.

The regression model was also statistically significant ($F = 15.856$, $p < 0.001$), which means that the strategic approaches together have significant predictions on the time performance of construction projects.

Among the six strategic approaches, only risk management (SA3) had a significant effect on time performance ($B = 0.432$, $t = 4.917$, $p < 0.001$). The positive regression coefficient indicates that improved risk management practices lead to better project time performance. A one-unit increase in risk management is associated with a 0.432-unit improvement in time performance, holding all other variables constant.

On the other hand, project planning (SA1), project scheduling (SA2), resource allocation (SA4), communication management (SA5) and monitoring and control (SA6) did not significantly predict time performance, as their p-value is greater than the 0.05 level of significance. Project scheduling had a relatively higher coefficient and was approaching significance ($p = 0.064$), but it did not reach the required level of significance.

Overall, the results show that while strategic approaches have a significant impact on project time performance, the only individual strategic approach that significantly contributes to the improvement of project completion time is risk management.

Multiple Regression Analysis Showing the Impact of Strategic Approaches in Construction Project Management on Cost Performance

A multiple regression analysis was performed to determine the degree to which the strategic approaches in construction project management impact cost performance. The analysis examined the predictive effects of project planning, project scheduling, risk management, resource allocation, communication management, and monitoring and control of cost performance. Multiple regression was used to determine which strategic approaches significantly predict cost performance, controlling the effects of other independent variables. The regression coefficients, t-values, p-values, coefficient of determination (R^2), and the significance of the overall regression model are presented in the results. The statistical measures serve as evidence for the individual and combined impact of strategic approaches on the achievement of effective cost performance in construction projects.

Table 23. Regression Statistic

Regression Statistics	
Multiple R	0.712868274
R Square	0.508181176
Adjusted R Square	0.439555294
Standard Error	0.542169281
Observations	50

Table 24. ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	6	13.06025623	2.176709371	7.405094963	1.75923E-05
Residual	43	12.63974377	0.29394753		
Total	49	25.7			

Table 25. Coefficient

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.769869071	0.348404322	2.209700118	0.0325002	0.067244793	1.472493349	0.067244793	1.472493349
SA1	0.325115124	0.117205075	2.77389972	0.008160702	0.088748564	0.561481684	0.088748564	0.561481684
SA2	0.24310224	0.171535381	1.417213398	0.163625857	-0.102831825	0.589036305	-0.102831825	0.589036305
SA3	0.12999977	0.116485283	1.116018839	0.270611999	-0.104915191	0.364914731	-0.104915191	0.364914731
SA4	-0.011493737	0.143534687	-0.080076375	0.936548042	-0.300959021	0.277971547	-0.300959021	0.277971547
SA5	0.010380015	0.126553271	0.082020917	0.93501069	-0.24483898	0.26559901	-0.24483898	0.26559901
SA6	-0.005274395	0.148846784	-0.035435061	0.971896817	-0.305452544	0.294903754	-0.305452544	0.294903754

All tables show the results of multiple regression analysis to test the impact of strategic approaches in construction project management on cost performance. The regression model generated a multiple R of 0.713, which is a relatively strong positive correlation between the strategic approaches and cost performance. The R^2 is 0.508, meaning that 50.8% of the variation in the cost performance can be explained by the six strategic approaches that are contained in the regression model. The remaining 49.2% can be attributed to other variables that are not considered in the study. The overall regression model was significant ($F = 7.405$, $p < 0.001$), indicating that the strategic approaches have a significant impact on cost performance in construction projects.

From the six strategic approaches, only Project Planning (SA1) has a statistically significant positive effect on cost performance ($B = 0.325$, $t = 2.774$, $p = 0.008$). This suggests that good project planning can have a significant effect on improving cost performance. That is, an increase of one unit in project planning will result in an increase of 0.325 units in cost performance, holding all other variables constant.

On the other hand, Project Scheduling (SA2), Risk Management (SA3), Resource Allocation (SA4), Communication Management (SA5) and Monitoring and Control (SA6) did not significantly predict cost performance because their p-values were above the 0.05 level of significance. In the present study, project scheduling and risk management had positive regression coefficients, but the effects were not statistically significant. Resource allocation and monitoring and control had small negative coefficients, but these effects were not statistically significant either.

In summary, the results indicate that although strategic approaches together have a significant effect on cost performance, project planning is the main strategic approach that has a significant contribution to the effective cost management of construction projects.

Multiple Regression Analysis Showing the Impact of Strategic Approaches in Construction Project Management on Quality Performance

To understand the effect of the strategic approaches in construction project management on quality performance, a multiple regression analysis was carried out. The analysis was to examine how the six strategic approaches, which include project planning, project scheduling, risk management, resource allocation, communication management and monitoring and control, predict quality performance in construction projects. The joint and individual effects of these strategic approaches on project quality were investigated using multiple regression

analysis. The F-test was used to check the overall model's significance for the regression, and the contribution of each independent variable was checked by the standardized regression coefficients, t-values, and their p-values at a 0.05 significance level. The analysis results are shown in Tables 23, 24, and 25.

Table 23. Regression Statistic

Regression Statistics	
Multiple R	0.820907226
R Square	0.673888673
Adjusted R Square	0.628384767
Standard Error	0.435038308
Observations	50

Table 24. ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	6	16.81689184	2.802815307	14.80946871	4.31939E-09
Residual	43	8.13810816	0.189258329		
Total	49	24.955			

Table 25. Coefficient

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.644413318	0.279560705	2.305092619	0.026051774	0.080625425	1.208201212	0.080625425	1.208201212
SA1	0.403775375	0.094045714	4.293394736	9.83428E-05	0.214114116	0.593436633	0.214114116	0.593436633
SA2	0.042365285	0.13764052	0.30779661	0.759723103	-0.235213278	0.319943849	-0.235213278	0.319943849
SA3	0.162490943	0.093468151	1.738463224	0.089285839	-0.026005548	0.350987434	-0.026005548	0.350987434
SA4	0.220001197	0.115172677	1.910185667	0.062793352	-0.012266642	0.452269036	-0.012266642	0.452269036
SA5	0.049863665	0.101546736	0.491041534	0.625893982	-0.154924846	0.254652176	-0.154924846	0.254652176
SA6	-0.068079124	0.11943512	-0.57000926	0.571637785	-0.308942999	0.17278475	-0.308942999	0.17278475

Analysis and Interpretation

All tables contain the results of the multiple regression analysis of the effect of strategic approaches in construction project management on quality performance. The regression analysis yielded a multiple R of 0.821, suggesting a strong positive relationship between strategic approaches and quality performance. The coefficient of determination (R^2) is 0.674, which suggests that 67.4% of quality performance is predictable from the six strategic approaches in the regression model and 32.6% of quality performance is explained by other factors not included in the study.

The overall regression model was statistically significant ($F=14.809$, $p<0.001$), revealing that the strategic approaches as a whole have significant influence on quality performance in construction projects.

Among the six strategic approaches, only Project Planning (SA1) showed a statistically significant positive effect on quality performance ($B = 0.404$, $t = 4.293$, $p < 0.001$). This shows that good project planning has a great effect on the quality of a project. In particular, a unit increase in project planning will lead to a 0.404 unit increase in quality performance, holding other factors constant.

However, Project Scheduling (SA2), Risk Management (SA3), Resource Allocation (SA4), Communication Management (SA5) and Monitoring and Control (SA6) did not significantly predict quality performance, as their respective p-values were above the 0.05 level of significance. However, the regression coefficients for risk management and resource allocation were positive but not statistically significant in this study.

Overall, the results suggest that while all strategic approaches together have a significant effect on quality performance, project planning is the only strategic approach that has a statistically significant positive independent effect on project quality.

SUMMARY, DISCUSSION OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

This chapter presents a summary, discussion of the findings, conclusions, and recommendations of the study: “Strategic Approaches to Construction Project Management and Their Effects on Project Performance in Terms of Time, Cost, and Quality." The data obtained from construction professionals was analyzed and interpreted to produce meaningful findings. To fulfill the research objectives and provide an answer to the problem statement, conclusions were made based on these findings. Additionally, suggestions are offered to help construction companies, project managers, engineers, contractors, and future researchers enhance construction project performance in terms of time, cost, and quality while guaranteeing adherence to the Philippine National Building Code.

Summary Of Findings

The strategic methods employed in construction project management were evaluated in this study along with how they affected the time, cost, and quality of the project. Fifty (50) construction specialists working on different construction projects provided the data. The following is a summary of the study's findings:

Demographic Profile of the Respondents

54% of the respondents were between the ages of 26 and 35, while 22% were between the ages of 18 and 25. 38% of respondents were women, and 60% of respondents were men. Site engineers made up the largest category (50%), followed by QA/QC engineers (14%). The largest group of respondents (38%) had between four and seven years of professional experience. In addition, 56 percent were involved in infrastructure projects.

Level of Implementation of Strategic Approaches to Construction Project Management

The degree of strategic approach execution was an overall composite mean of 2.92, which is comprehensive. Among all the variables, project planning had the highest weighted mean (3.02), followed by Risk Management (2.96) and Learning from Past Projects (2.94). The lowest weighted mean was recorded for stakeholder communication and involvement (2.80) but was still within the comprehensive level.

Level of Project Performance in Terms of Time, Cost, and Quality

The findings revealed that the project's performance was generally rated comprehensively in all categories.

The time performance composite average was 2.75.

The composite mean for cost performance was 2.82.

The composite means of quality performance is 2.98.

Construction companies give special importance to standard compliance, quality assurance, and continuous quality improvement, with quality performance being the highest among the three aspects.

Extent of Contribution of Strategic Approaches to Overall Project Success

The composite mean for the strategic approaches' contribution to project success was 2.82, which is considered comprehensive. According to the respondents, strategic approaches greatly enhance project outcomes, especially with regard to time, cost, and quality performance.

Relationship Between Strategic Approaches and Project Performance

A correlation coefficient of r = 0.790 and a p-value of 0.000 were found using the Pearson correlation analysis. The outcome shows that strategic approaches and project performance have a strong positive and statistically significant link. The null hypothesis was rejected since the p-value fell below the significance level of 0.05.

Level of Compliance with the National Building Code of the Philippines

With a weighted mean of 4.48, respondents strongly agreed that construction management procedures had to be in line with the Philippine National Building Code. With a weighted mean of 3.80, the degree of compliance was determined to be Strictly Implemented. Additionally, compliance was thought to have a Very High Impact on Quality Performance (4.44), a High Impact on Time Performance (4.12), and a High Impact on Cost Performance (4.22).

Relationship Between Compliance with the National Building Code and Project Performance

The results of the correlation analysis showed a moderately positive and statistically significant relationship between project performance and adherence to the National Building Code, with a correlation coefficient of r = 0.417 and a p-value of 0.001. The null hypothesis was rejected since the p-value was less than 0.05.

Factors Contributing to Construction Project Success

The respondents stated that the success of construction projects depends much on a number of aspects. The most frequently mentioned aspects were effective planning and scheduling, appropriate project management and supervision, excellent teamwork and communication, effective cost management and budget control, quality control and assurance, and efficient resource and workforce management. The findings suggest that the ability of construction teams and project managers to organize resources, maintain open lines of communication, monitor project progress, and ensure compliance with quality standards throughout the project lifecycle is vital to project implementation success.

Common Challenges Encountered in Construction Projects

The survey found that construction workers face a number of difficulties in carrying out projects. Project delays and scheduling problems, budget constraints and cost overruns, communication and coordination problems among project participants, unforeseen risks and outside factors, manpower-related problems, and lack of management and supervision were the most frequently mentioned barriers. If these problems are not properly addressed with proactive planning and effective management techniques, they may adversely affect the performance of the project and hinder the achievement of project objectives.

Recommended Improvements to Enhance Project Performance

The comments from the respondents suggested some improvements to enhance the project performance. These

include strengthening project planning and scheduling procedures, enhancing stakeholder coordination and communication, improving project management and monitoring systems, implementing contemporary technologies and digital project management tools, optimizing cost control and resource allocation, and strengthening quality assurance protocols. The respondents observed that the implementation of these changes could lead to better project outcomes, enhanced efficiency, fewer delays, and the delivery of higher quality construction projects.

Impact of Strategic Approaches in Construction Project Management on Overall Project Performance

The multiple regression analysis revealed that the strategic approaches in construction project management collectively have a significant influence on overall project performance, as indicated by the significant regression model ($F = 14.809$, $p < 0.001$). The model explained 67.4% ($R^2 = 0.674$) of the variation in overall project performance. Among the six strategic approaches, Project Planning was the only variable that significantly predicted overall project performance ($\beta = 0.404$, $p < 0.001$). In contrast, Project Scheduling, Risk Management, Resource Allocation, Communication Management, and Monitoring, and Control did not demonstrate statistically significant individual effects. These findings indicate that effective project planning is the primary strategic approach contributing to improved overall project performance.

Impact of Strategic Approaches in Construction Project Management on Time Performance

The regression analysis showed that the strategic approaches collectively have a significant effect on project time performance ($F = 15.856$, $p < 0.001$). The regression model accounted for 68.9% ($R^2 = 0.689$) of the variance in time performance. Among the six strategic approaches, Risk Management emerged as the only significant predictor ($\beta = 0.432$, $p < 0.001$), indicating that effective risk identification and mitigation contribute significantly to timely project completion. Project Planning, Project Scheduling, Resource Allocation, Communication Management, and Monitoring and Control did not have statistically significant individual effects on time performance.

Impact of Strategic Approaches in Construction Project Management on Cost Performance

The regression results indicated that the strategic approaches significantly influence project cost performance ($F = 7.405$, $p < 0.001$). The model explained 50.8% ($R^2 = 0.508$) of the variation in cost performance. Among the independent variables, Project Planning was found to be the only significant predictor of cost performance ($\beta = 0.325$, $p = 0.008$), suggesting that effective planning enhances budget control and minimizes cost overruns. The remaining strategic approaches—Project Scheduling, Risk Management, Resource Allocation, Communication Management, and Monitoring and Control—did not exhibit statistically significant individual effects on cost performance.

Impact of Strategic Approaches in Construction Project Management on Quality Performance

The multiple regression analysis demonstrated that the strategic approaches collectively have a significant impact on project quality performance ($F = 14.809$, $p < 0.001$). The regression model explained 67.4% ($R^2 = 0.674$) of the variation in quality performance. Among the six strategic approaches, Project Planning was the only significant predictor ($\beta = 0.404$, $p < 0.001$), indicating that comprehensive planning plays a vital role in achieving high-quality construction outcomes. Project Scheduling, Risk Management, Resource Allocation, Communication Management, and Monitoring and Control were not found to have statistically significant individual effects on quality performance.

Discussion Of Findings

The findings of this study demonstrate that strategic approaches in construction project management are generally implemented at a comprehensive level among construction professionals. This indicates that organizations consistently apply key management practices such as planning, risk management, scheduling, communication, and resource allocation throughout the project's life cycle. Among these, project planning emerged as the most dominant strategic approach, followed by risk management and learning from past project experiences. This suggests that construction organizations place strong emphasis on defining clear project objectives, anticipating risks, and improving future project performance through organizational learning.

These results strongly support the Project Management Triangle Theory (Barnes, 2006), which emphasizes that project success depends on the balance of time, cost, and quality constraints. In relation to this, the PMBOK® Guide (PMI, 2021) reinforces that effective planning, stakeholder engagement, and risk management are fundamental principles for achieving successful project outcomes. Likewise, Kerzner (2022) emphasizes that

detailed planning reduces uncertainty and strengthens project control, which directly supports the prominence of project planning found in this study. Furthermore, the findings are consistent with the systematic reviews of Göküz and Akıner (2025) and Alnajjar et al. (2025), which highlight planning, coordination, and integrated management practices as key drivers of construction project success.

The study also revealed that construction project performance in terms of time, cost, and quality was rated at a comprehensive level, with quality performance receiving the highest evaluation. This indicates that construction organizations prioritize compliance with quality standards while still managing schedule and cost constraints. This finding is strongly aligned with Total Quality Management (TQM) Theor (Deming, 1986), which emphasizes continuous improvement, process control, and organizational responsibility for quality. Oakland (2022) further supports this by stating that continuous quality improvement enhances efficiency and operational performance. Similarly, Bondre et al. (2022) found that structured quality management practices reduce rework, improve coordination, and enhance overall construction outcomes. These results suggest that quality-oriented strategic practices remain central to construction project success.

The results further indicate that strategic approaches in construction project management significantly influence overall project performance. This finding is best explained by Systems Theory (Bertalanffy, 1968), which views project management as an interconnected system where planning, scheduling, communication, risk management, and resource allocation work together to influence outcomes. When these components are effectively integrated, project performance improves. This is consistent with the PMBOK® Guide (PMI, 2021), which emphasizes that project success depends on the integration of multiple management processes rather than isolated practices. Kerzner (2022) also supports this view by highlighting that coordinated management functions enhance project control and decision-making. Empirical studies by Göküz and Akıner (2025) and Alnajjar et al. (2025) similarly confirm that integrated strategic practices improve construction project performance in terms of time, cost, and quality.

In terms of regression results, the study found that project planning is the strongest and only significant predictor of overall cost and quality performance. This implies that well-developed planning processes play a critical role in ensuring efficient resource allocation, realistic scheduling, and effective quality control. This finding is strongly supported by the PMBOK® Guide (PMI, 2021), which identifies planning as a core process group essential for successful project delivery. Kerzner (2022) further explains that effective planning reduces uncertainty and improves forecasting accuracy, leading to better project control. Additionally, Alnajjar et al. (2025) found that planning integrated with modern project management approaches significantly enhances project efficiency and outcomes.

On the other hand, risk management emerged as the only significant predictor of time performance. This suggests that timely project completion depends largely on how effectively project risks are identified, assessed, and mitigated. This finding supports Contingency Theory (Fiedler, 1964), which emphasizes that management strategies must adapt to project conditions and uncertainties. Kerzner (2022) also highlights that adaptive management reduces delays and improves project responsiveness. Furthermore, Tobar-Montilla et al. (2025) and Zhasmukhambetova et al. (2025) confirm that integrating risk management into scheduling improves schedule reliability and reduces the likelihood of delays in construction projects.

Although scheduling, communication, resource allocation, and monitoring were not statistically significant for predictors individually, their role should not be disregarded. Instead, their influence may be indirect or interactive, particularly through planning and risk management. This interpretation is consistent with Systems Theory, which emphasizes that project performance is the result of interactions among interconnected management components rather than isolated effects. This is also supported by Göküz and Akıner (2025) and Alnajjar et al. (2025), who concluded that construction project success depends on the combined application of multiple strategic practices rather than a single dominant factor.

The study further found a strong positive relationship between strategic management practices and overall project performance. This confirms that higher levels of strategic implementation result in improved time, cost, and quality outcomes. This finding supports both the Project Management Triangle Theory and Contingency Theory, which emphasizes balance among project constraints and adaptation to project conditions. Similarly,

Garcia and Pilar (2025) and Pedron et al. (2025) found that effective planning, communication, supervision, and risk management significantly enhance construction project outcomes.

Finally, compliance with the National Building Code of the Philippines was found to significantly influence quality performance. This finding aligns with TQM Theory, which emphasizes adherence to standards, continuous improvement, and systematic quality control. It also supports Systems Theory, which considers regulatory compliance as an essential component of integrated project management. Consistent with Bondre et al. (2022), compliance reduces defects, minimizes rework, and improves construction quality and project reliability.

Conclusion

The results of the study indicate that construction professionals have sufficient experience and knowledge to assess the adoption of strategic methods in construction project management and their impact on project performance. The results showed the full implementation of strategic methods such as project planning, risk management, stakeholder communication, resource management, the use of modern methodologies and techniques, and continuous improvement by learning from previous projects. Similarly, project performance was also assessed holistically on the basis of time, cost, and quality. The highest score was attributed to quality performance.

The study also showed strategic approaches have a big effect on the success of the project as a whole. Correlation analysis found that the effective application of strategic management techniques leads to superior project outcomes, measured by on-time completion, cost efficiency, and quality achievement. A strong positive and statistically significant relationship exists between strategic approaches and project performance. The findings suggest the importance of clear management techniques throughout the project lifecycle.

The respondents also recognized the high degree of conformity to the Philippine National Building Code since it has an important role to ensure high-quality, safe construction techniques. The results also showed a statistically significant positive relationship between compliance with the National Building Code and project performance. This shows that compliance with laws leads to better project results, especially in the areas of quality standards and project implementation.

The multiple regression analyses also provided further evidence that the strategic approaches in construction project management significantly influence the construction project performance in terms of overall performance, time performance, cost performance and quality performance. Project planning was found to be the best predictor of overall project performance, cost performance, and quality performance among the strategic approaches studied. This highlights the significance of project planning to set objectives, allocate resources, manage costs, and meet quality requirements. On the other hand, only risk management was a significant predictor of time performance. This indicates the importance of proactively identifying and mitigating project risks to avoid delays and delivering projects on time. While the regression models did not show that project scheduling, resource allocation, communication management and monitoring and control were significant predictors, these practices are still essential parts of project management and may help to achieve project success by interacting with planning, risk management and other organizational factors.

The study concludes that the successful implementation of construction projects depends on the effective adoption of strategic project management techniques and strict compliance with the Philippine National Building Code. All the strategic approaches contribute to project success, but the results highlight the importance of strengthening project planning and risk management to improve overall time, cost, and quality performance. The findings of this study reinforce the theoretical foundations of project management by showing that systematic planning, proactive risk management, and integrated management practices are significant determinants of successful construction project performance. In addition, the research contributes to the empirical evidence in the field of construction project management by showing that strategic management practice has a significant impact on the performance of projects in the construction industry.

Recommendation

Development of a Standardized Construction Project Management Code

It is recommended that the governing authorities provide a written set of guidelines on construction project management procedures. The proposed framework is geared towards management procedures rather than structural conformance and may operate similarly to the National Building Code of the Philippines (1977).

This "Construction Project Management Code" (Project Management Institute, 2021) should include standardized practices according to international project management standards, such as the following:

- Project planning and scheduling
- Risk management protocols
- Quality control and assurance systems (ISO 9001, 2015)
- Documentation and reporting
- Monitoring and evaluation mechanisms

Step-by-Step Implementation of Management Regulations

Project management best practice dictates that a structured lifecycle-based management framework needs to be established to ensure successful compliance (Project Management Institute, 2021):

1. Pre-Construction Phase

- Perform feasibility studies and risk assessments
- Develop project plans and timelines
- Establish quality standards

2. Planning and Design Phase

- Embed management strategies into design
- Allocate resources efficiently
- Establish communication systems

3. Procurement Phase

- Verify transparent contractor selection
- Verify material quality compliance
- Define contractual obligations clearly

4. Construction Phase

- Execute supervision and monitoring systems
- Conduct regular inspection
- Address delays and issues promptly

5. Post-Construction Phase

- Perform final inspections
- Evaluate time and quality performance
- Document lessons learned

In addition, these stages follow the infrastructure management techniques suggested by the Department of Public Works and Highways.

Policy Formulation and Legal Institutionalization

The government should formalize construction project management standards into policies in collaboration with organizations like the Professional Regulation Commission and the Department of Public Works and Highways. This includes:

- Compliance with management guidelines is required.
- Project Management Certification
- Requirements Periodic audits and inspections.
- Non-compliance penalties

These recommendations are consistent with the regulatory processes and governance framework of the construction industry in the Philippines.

D. Implementation of Seminars and CPD Program

Regular training programs and seminars should be introduced for the improvement of competences of construction professionals These programs should be succeeded by the Continuing Professional Development Act of 2016 (2016) that mandates licensed professionals to continue their education.

Seminar topics may include:

Advanced project management strategies (Project Management Institute, 2021)

Time and quality performance improvement techniques

Updates on regulatory policy

Case studies and best practices

Engineers and contractors who attend these programs can earn CPD credits and improve their project performance and professional competence.

Industry Collaboration and Continuous Improvement

Lastly, there is a need to enhance cooperation among governmental bodies, business enterprises, educational institutions, and professional associations. The continuous improvement techniques should be applied to ensure that the construction management procedures are still efficient and sensitive to the demands of the sector as stressed in ISO 9001 (2015). Continuous research, feedback channels, and the regular evaluation and update of management standards can further support improvements in time and quality performance.

Final thought

In addition to technical expertise, structured and controlled management methods are essential for enhancing the time and quality performance of construction projects. The integration of project management methods with existing standards (Project Management Institute, 2021), regulatory systems such as the National Building Code of the Philippines (1977), and quality management systems such as ISO 9001 (2015) can contribute to higher efficiency, accountability, and sustainability in the construction industry

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APPENDICES

Appendix A

Research Survey Questionnaire

This survey forms part of the research study entitled "Strategic Approaches to Construction Project Management and Their Impact on Time, Cost, and Quality Performance: A Survey-Based Study." The study aims to examine the factors contributing to construction project delays and to identify effective management strategies that enhance project performance in terms of time, cost, and quality.

The purpose of this survey is to gather data and validate the proposed research. Your honest responses and professional insights are essential in strengthening the reliability and credibility of the study.

Participation in this survey is entirely voluntary. All information provided will be treated with strict confidentiality in accordance with Republic Act No. 10173, also known as the Data Privacy Act of 2012. Any personal data collected will be used solely for academic and research purposes and will not be disclosed outside the research team.

By proceeding with this survey, you indicate your informed consent to participate. You confirm that you understand the purpose of the study and agree to the use of your responses under the conditions stated. You may withdraw your participation at any time without any consequence.

Thank you for your time and valuable contribution to this research.

Sincerely,

Baniel, John

Dela Cruz, Jhon Rhenciel

Miranda, Venice

SECTION 0: DEMOGRAPHIC PROFILE

Instruction: Please check the appropriate answer.

1. Age:

☐ 18–25

☐ 26–35

☐ 36–45

☐ 46–55

☐ 56 and above

2. Sex:

☐ Male

☐ Female

☐ Prefer not to say

3. Position / Role:

☐ Project Manager

☐ Site Engineer / Field Engineer

☐ Construction Supervisor

☐ Quantity Surveyor

☐ Company Executive / Manager

☐ Planning Engineer / Scheduler

☐ QA/QC Engineer

☐ Safety Officer

☐ Design Engineer / Architect

☐ Client / Project Owner

☐ Consultant

☐ Contractor / Subcontractor

4. Years of Experience:

☐ Less than 1 year

☐ 1–3 years

☐ 4–7 years

☐ 8–10 years

☐ More than 10 years

5. Type of Projects:

☐ Residential

☐ Commercial

☐ Infrastructure

☐ Industrial

☐ Others: _____

Instructions

Please select the option that best describes your organization's typical practice in managing construction projects.

Scale Definition:

Basic – Practices are minimal, informal, and mostly reactive

Proactive – Practices are planned in advance but not consistently applied

Comprehensive– Practices are well-structured, consistently implemented, and monitored

Strategic – Practices are highly optimized, data-driven, and continuously improved for maximum performance

SECTION 1: Project Management Practices

1.1 Planning of Projects

To what extent does your organization conduct detailed and structured planning (including tasks, timelines, and resource allocation) before the start of a construction project?

Basic / Proactive / Comprehensive / Strategic

1.2 Risk Management Approach

How effectively does your organization identify, assess, and manage potential risks (e.g., delays, cost overruns, environmental factors) throughout the project lifecycle?

Basic / Proactive / Comprehensive / Strategic

1.3 Use of Modern Methods and Techniques

To what extent does your organization apply modern project management methods, tools, or frameworks to improve project execution and control?

Basic / Proactive / Comprehensive / Strategic

1.4 Stakeholder Communication and Involvement

How effectively does your organization ensure clear, consistent, and timely communication among all stakeholders (clients, contractors, suppliers, and workers)?

Basic / Proactive / Comprehensive / Strategic

1.5 Resource Management (Labor, Materials, Equipment)

How well does your organization plan, allocate, and manage resources to ensure availability and efficiency throughout the project?

Basic / Proactive / Comprehensive / Strategic

1.6 Learning from Past Projects (Continuous Improvement)

How effectively does your organization review past project experiences and apply lessons learned to improve future project performance?

Basic / Proactive / Comprehensive / Strategic

SECTION 2: TIME Performance (Meeting Deadlines)

2.1 Effectiveness of Planning in Meeting Deadlines

To what extent does project planning contribute to completing projects within the scheduled timeframe?

Basic / Proactive / Comprehensive / Strategic

2.2 Effectiveness of Scheduling Methods in Reducing Delays

How effective are your scheduling practices in minimizing or preventing delays during project execution?

Basic / Proactive / Comprehensive / Strategic

2.3 Effectiveness of Risk Management in Preventing Delays

To what extent does risk management help in avoiding time overruns and maintaining the project schedule?

Basic / Proactive / Comprehensive / Strategic

2.4 Communication in Maintaining Project Schedule

How does communication among project stakeholders contribute to maintaining the planned project timeline?

Basic / Proactive / Comprehensive / Strategic

2.5 Response to Delays

How efficiently does your organization respond to and resolve delays when they occur?

Basic / Proactive / Comprehensive / Strategic

SECTION 3: COST Performance (Budget Control)

3.1 Cost Control Effectiveness

How effective are your organization’s management practices in maintaining project costs within the approved budget?

Basic / Proactive / Comprehensive / Strategic

3.2 Accuracy of Cost Estimation

To what extent are your initial cost estimates aligned with the actual project expenses?

Basic / Proactive / Comprehensive / Strategic

3.3 Planning in Reducing Unnecessary Costs

How effective is project planning in minimizing unnecessary or avoidable expenses?

Basic / Proactive / Comprehensive / Strategic

3.4 Risk Management in Avoiding Extra Costs

To what extent does risk management help prevent unexpected or additional costs during project execution?

Basic / Proactive / Comprehensive / Strategic

3.5 Monitoring of Project Expenses

How consistently and effectively are project expenses monitored and controlled throughout the project lifecycle?

Basic / Proactive / Comprehensive / Strategic

SECTION 4: QUALITY Performance

4.1 Management Approach in Improving Quality

To what extent does your project management approach contribute to achieving high-quality construction outputs?

Basic / Proactive / Comprehensive / Strategic

4.2 Frequency of Quality Checks

How regularly are quality inspections and evaluations conducted during project execution?

Basic / Proactive / Comprehensive / Strategic

4.3 Use of Technology to Improve Quality

To what extent does the use of advanced tools and technologies enhance the quality of project deliverables?

Basic / Proactive / Comprehensive / Strategic

4.4 Compliance with Standards

How effectively does your organization ensure that project outputs meet required standards, specifications, and regulations?

Basic / Proactive / Comprehensive / Strategic

SECTION 5: Overall Project Performance

5.1 Overall Effectiveness of Management Approach

How effective is your organization’s overall project management approach in achieving successful project outcomes?

Basic / Proactive / Comprehensive / Strategic

5.2 Impact on Time, Cost, and Quality

To what extent does your management approach improve project performance in terms of time, cost, and quality?

Basic / Proactive / Comprehensive / Strategic

5.3 Ability to Balance Time, Cost, and Quality

How effectively does your organization maintain a balance among project schedule, budget, and quality requirements?

Basic / Proactive / Comprehensive / Strategic

5.4 Competitive Advantage of Management Approach

To what extent does your project management approach provide a competitive advantage over other organizations?

Basic / Proactive / Comprehensive / Strategic

Section 6: National building code

Question:

To what extent do you agree that construction management practices in the Philippines should be strictly governed and aligned with the provisions of the National Building Code of the Philippines to improve project performance in terms of time, cost, and quality?

Responses:

Strongly Agree
Agree
Neutral
Disagree
Strongly Disagree

1. Compliance Level

Question:

Based on your experience, how strictly are construction management practices currently aligned with the National Building Code of the Philippines?

Responses:

Very Strictly Implemented
Strictly Implemented
Moderately Implemented
Slightly Implemented
Not Implemented

2. Impact on Project Performance

Question:

How does compliance with the National Building Code of the Philippines affect project outcomes?

Responses (Rate each):

Aspect	Very High Impact	High impact	Moderate	Low	No Impact
Time performance					
Cost control					
Quality of work					

Need for Expansion

Question

Do you think the National Building Code of the Philippines should be expanded to include more detailed provisions specifically for construction management practices?

Responses:

Yes

Maybe
No

Optional Questions (Open-Ended)

1. In your opinion, what factors contribute most to the success of a construction project?

2. What common challenges do you encounter in managing construction projects?

3. What improvements would you recommend to enhance project performance in terms of time, cost, and quality?

4.What improvements or additions to the National Building Code of the Philippines would enhance construction management practices in the Philippines?

Appendix B

Validation Form and Rating

Republic of the Philippines
BULACAN STATE UNIVERSITY
City of Malolos, Bulacan
GRADUATE SCHOOL

SURVEY INSTRUMENT VALIDATION RATING SCALE

Direction: Please circle the number that best represents your level of agreement or disagreement with the statements listed below.

1 – Strongly Disagree 2 – Disagree 3 – Undecided 4 – Agree 5 – Strongly Agree

1. The items in the instrument are relevant to answer the objectives of the study.	(5)	4	3	2	1
2. The items in the instrument can give a detailed understanding of the concepts being measured.	5	(4)	3	2	1
3. The instrument has an appropriate sample of items for the concepts /variables being measured.	(5)	4	3	2	1
4. The items and their alternatives are neither too narrow nor limited in its content.	5	(4)	3	2	1
5. The items in the instrument are clearly stated.	5	(4)	3	2	1
6. The items on the instrument can elicit responses which are stable, definite, consistent and not conflicting.	5	(4)	3	2	1
7. The terms adapted in the scale are culturally appropriate.	(5)	4	3	2	1
8. The layout or format of the instrument is technically sound.	5	(4)	3	2	1
9. The responses on the scale show a reasonable range of variation.	5	(4)	3	2	1
10. The instrument is not too short or long enough that the participants will be able to answer it within a given time.	5	(4)	3	2	1
11. The instrument is interesting such that participants will be prompted to respond to it and accomplish it fully.	5	(4)	3	2	1
12. The instrument as a whole could answer the basic purpose for which it is designed.	(5)	4	3	2	1
13. The instrument is culturally acceptable when	(5)	4	3	2	1

Republic of the Philippines
BULACAN STATE UNIVERSITY
City of Malolos, Bulacan
GRADUATE SCHOOL

SURVEY INSTRUMENT VALIDATION RATING SCALE

Direction: Please circle the number that best represents your level of agreement or disagreement with the statements listed below.

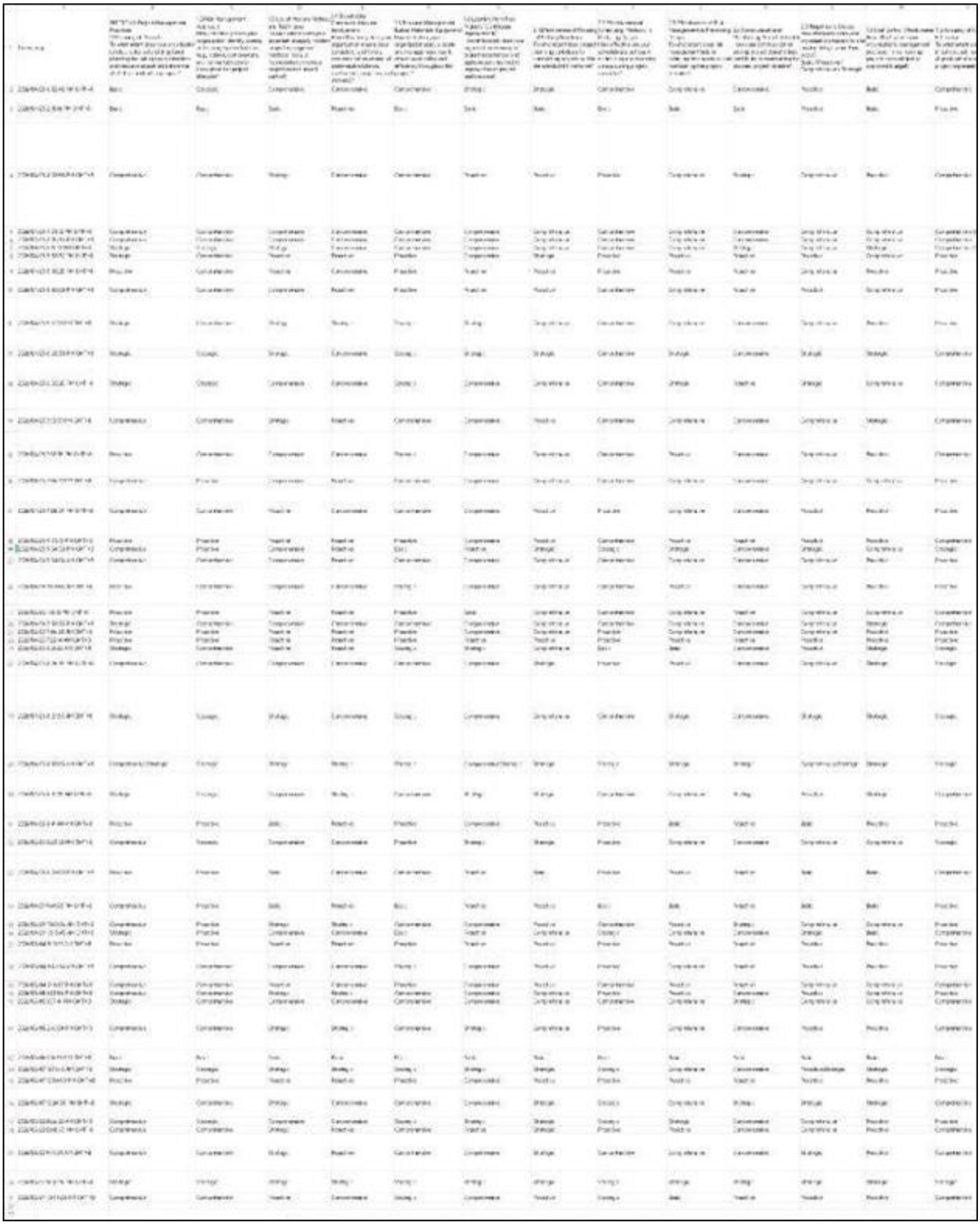
1 – Strongly Disagree 2 – Disagree 3 – Undecided 4 – Agree 5 – Strongly Agree

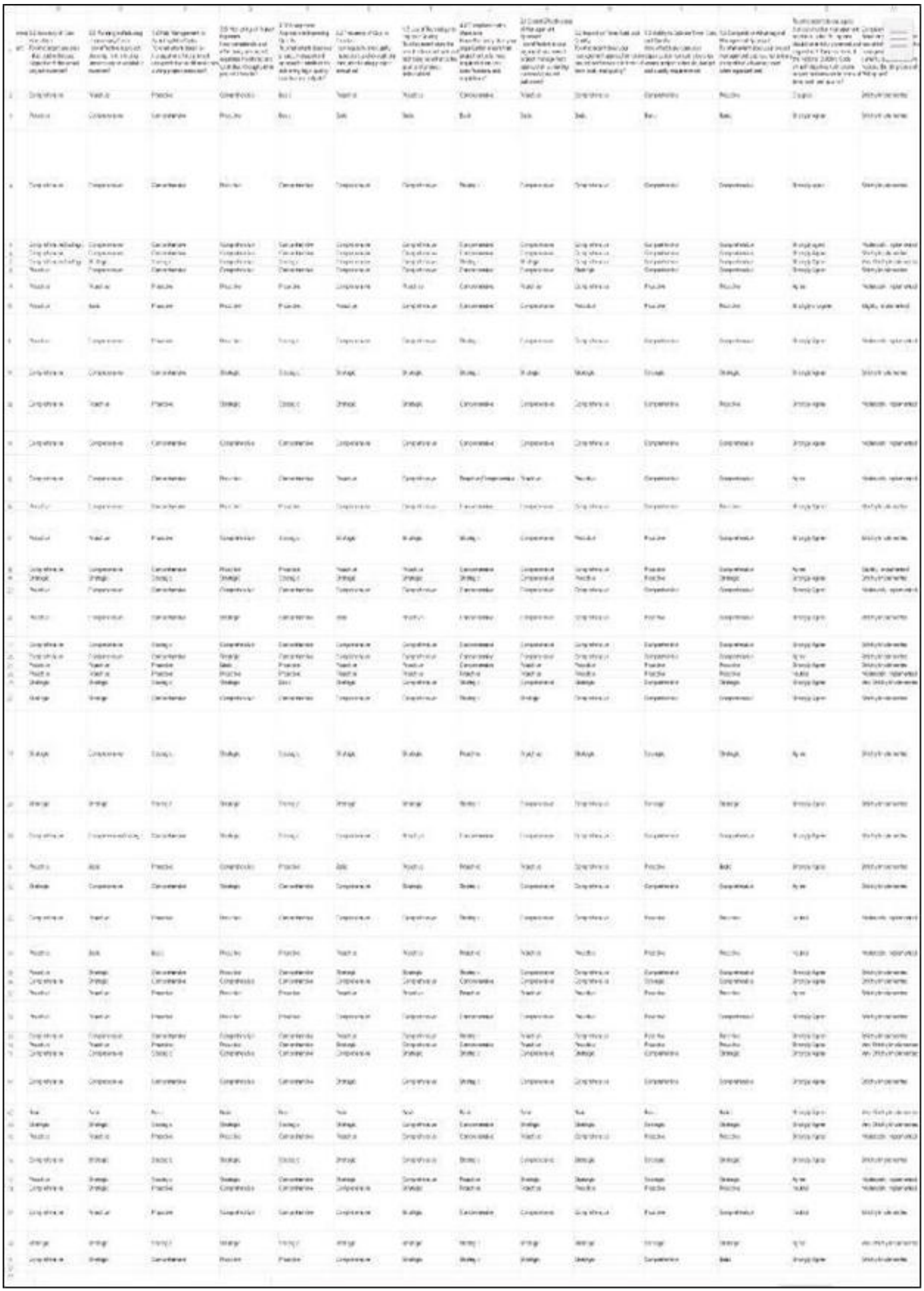
1. The items in the instrument are relevant to answer the objectives of the study.	(5)	4	3	2	1
2. The items in the instrument can give a detailed understanding of the concepts being measured.	(5)	4	3	2	1
3. The instrument has an appropriate sample of items for the concepts /variables being measured.	(5)	4	3	2	1
4. The items and their alternatives are neither too narrow nor limited in its content.	5	(4)	3	2	1
5. The items in the instrument are clearly stated.	(5)	4	3	2	1
6. The items on the instrument can elicit responses which are stable, definite, consistent and not conflicting.	(5)	4	3	2	1
7. The terms adapted in the scale are culturally appropriate.	5	(4)	3	2	1
8. The layout or format of the instrument is technically sound.	(5)	4	3	2	1
9. The responses on the scale show a reasonable range of variation.	(5)	4	3	2	1
10. The instrument is not too short or long enough that the participants will be able to answer it within a given time.	5	(4)	3	2	1
11. The instrument is interesting such that participants will be prompted to respond to it and accomplish it fully.	(5)	4	3	2	1
12. The instrument as a whole could answer the basic purpose for which it is designed.	(5)	4	3	2	1
13. The instrument is culturally acceptable when administered in the local setting.	(5)	4	3	2	1
Total	30	12			
Average	4.769				

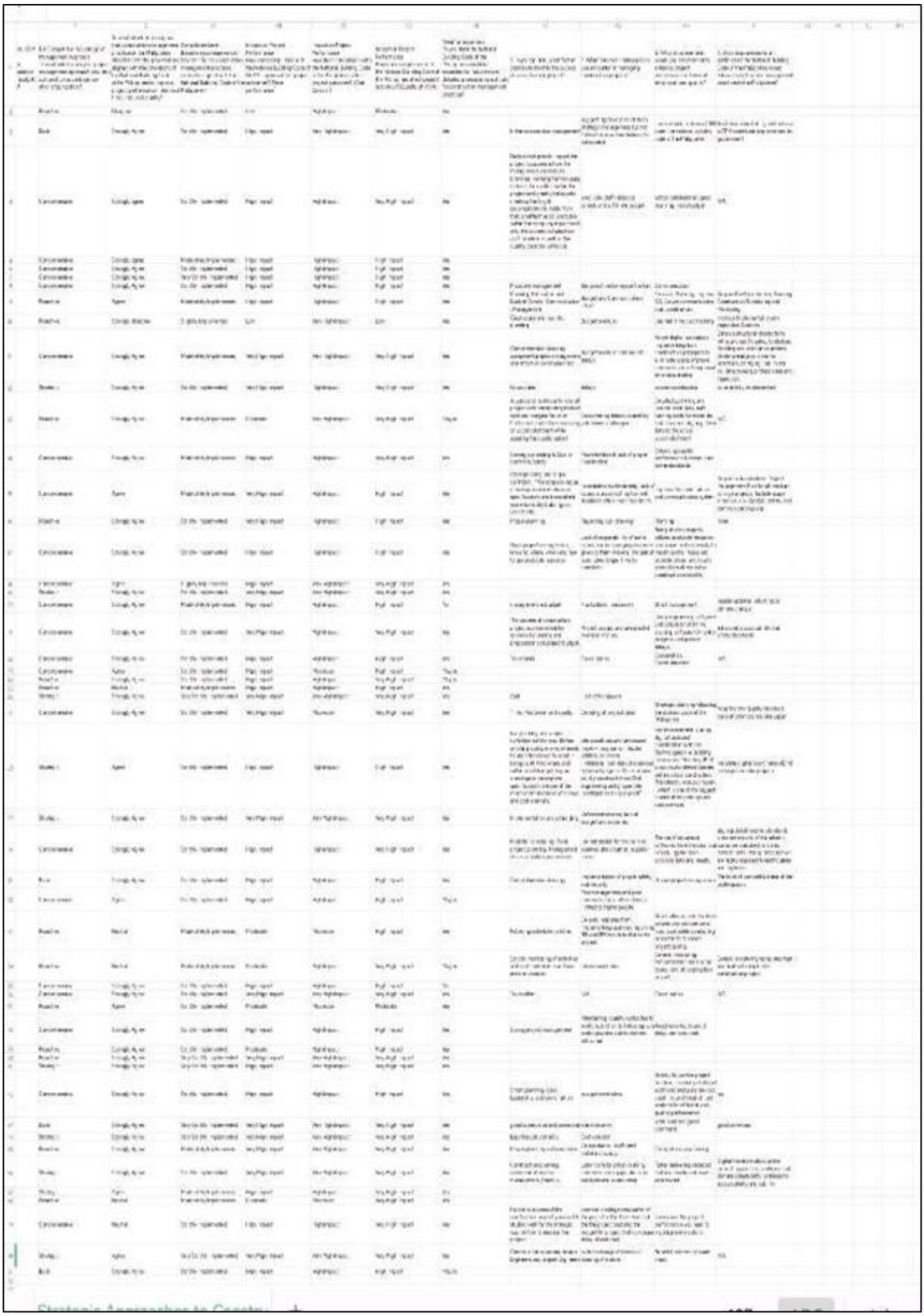
Source: Oducado, R. F. (2020, April 1). Survey Instrument Validation Rating Scale. https://doi.org/10.13140/RG.2.2.25263.59040

Appendix C

Raw Data







Appendix D

Scale Value

	A	B	C	D	E	F	G
1				Section 1			
2	Respondents	Q1.1	Q1.2	Q1.3	Q1.4	Q1.5	Q1.6
3	1	1	4	3	3	3	4
4	2	1	1	1	2	1	1
5	3	3	3	4	3	3	2
6	4	3	3	3	3	3	3
7	5	3	3	3	3	3	3
8	6	4	4	4	3	3	3
9	7	4	3	2	2	2	3
10	8	2	3	2	3	2	2
11	9	3	3	3	2	2	2
12	10	4	3	4	4	4	4
13	11	4	4	4	3	4	4
14	12	4	4	3	3	4	3
15	13	3	3	4	2	3	3
16	14	2	3	3	3	4	3
17	15	3	2	3	2	3	3
18	16	3	3	2	3	3	3
19	17	2	2	2	2	2	3
20	18	3	2	3	2	1	2
21	19	3	3	3	2	3	3
22	20	2	3	3	3	4	3
23	21	2	2	2	2	2	1
24	22	4	3	3	3	3	3
25	23	2	2	2	2	2	3
26	24	2	2	2	2	2	2
27	25	4	3	2	2	4	4
28	26	3	3	3	3	3	3
29	27	4	4	4	3	4	3
30	28	3	4	4	4	4	3
31	29	4	4	3	4	3	4
32	30	2	2	1	2	2	3
33	31	3	4	3	3	2	4
34	32	2	2	1	3	3	2
35	33	3	2	1	2	1	2
36	34	3	2	4	4	3	3
37	35	4	2	3	3	1	2
38	36	2	2	2	2	2	2
39	37	3	3	3	3	4	3
40	38	3	3	2	3	2	3
41	39	3	3	4	4	3	3
42	40	4	3	3	3	3	3
43	41	3	3	4	4	3	4
44	42	1	1	1	1	1	1
45	43	4	4	4	4	4	4
46	44	2	2	2	2	2	3
47	45	4	3	4	3	3	3
48	46	3	4	3	3	4	4
49	47	3	3	4	2	3	2
50	48	3	3	4	2	3	3
51	49	4	4	4	4	4	4
52	50	3	3	2	3	4	3
53							
54							
55							
56							

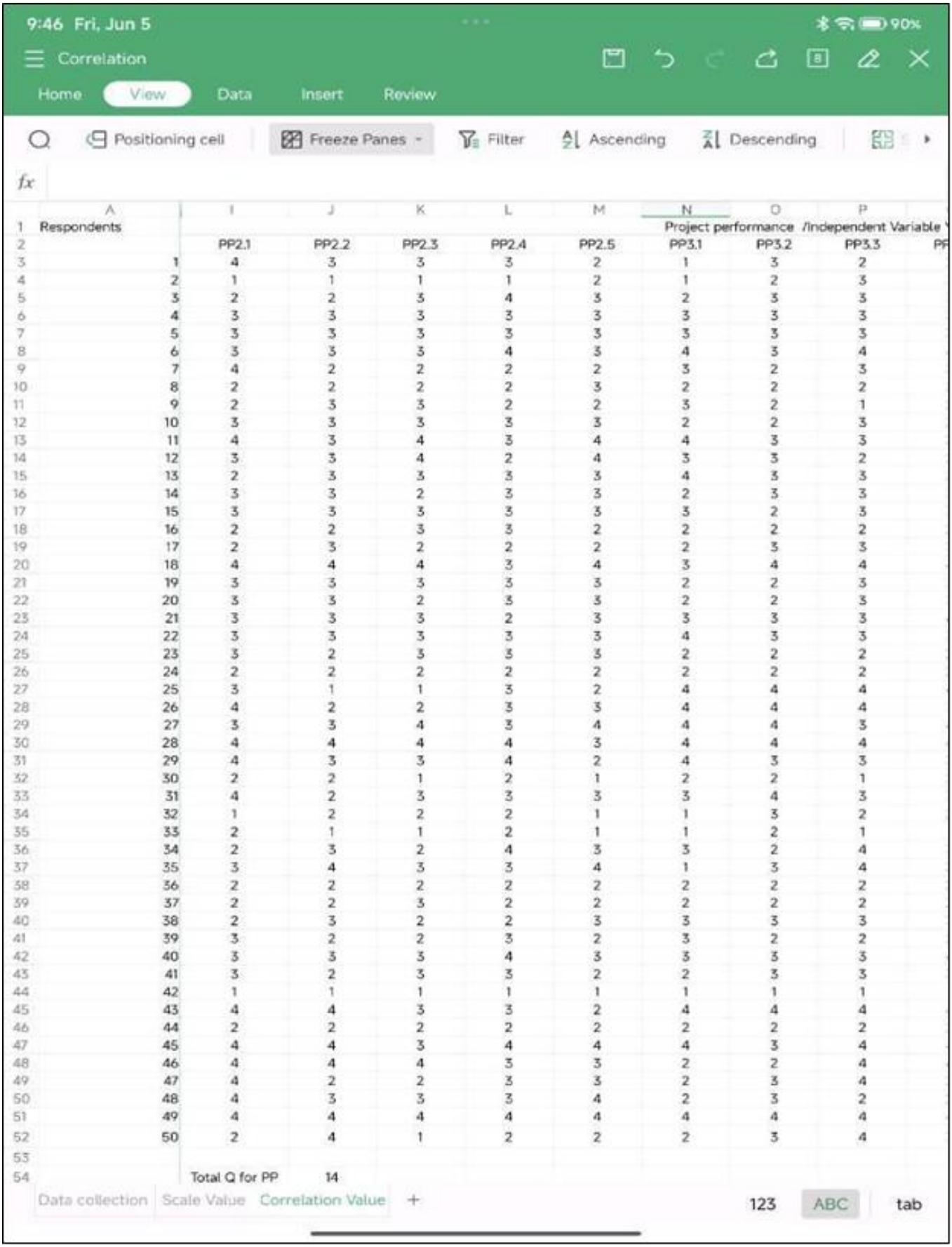
Data collection | Scale Value | Sheet1 | +

	A	AA	AB	AC	AD	AE	AF
1		Section 6					
2	Respondents	Compliance level	Impact on Time performance	Impact on Cost control	Impact on quality of work	Need for expansion	
3	1		2	4	3	3	
4	2		4	5	5	3	
5	3		4	4	5	3	
6	4		4	4	4	3	
7	5		4	4	4	3	
8	6		4	4	4	3	
9	7		4	4	4	3	
10	8		4	4	4	3	
11	9		2	5	2	3	
12	10		5	5	5	3	
13	11		5	4	5	3	
14	12		3	5	5	2	
15	13		4	4	5	3	
16	14		5	4	4	3	
17	15		5	4	4	3	
18	16		4	4	4	3	
19	17		4	5	5	3	
20	18		5	5	5	3	
21	19		4	4	4	1	
22	20		5	4	5	3	
23	21		4	4	4	3	
24	22		4	3	4	2	
25	23		4	4	5	2	
26	24		4	4	4	3	
27	25		5	5	5	3	
28	26		5	3	5	3	
29	27		4	4	4	3	
30	28		5	5	5	3	
31	29		4	4	5	3	
32	30		4	4	4	3	
33	31		4	4	4	2	
34	32		3	3	4	3	
35	33		3	4	5	2	
36	34		4	4	4	1	
37	35		5	5	5	3	
38	36		3	3	3	3	
39	37		4	4	4	3	
40	38		3	4	4	3	
41	39		5	5	5	3	
42	40		4	5	5	3	
43	41		4	4	4	3	
44	42		5	5	5	3	
45	43		5	5	5	3	
46	44		5	5	5	3	
47	45		5	5	5	3	
48	46		4	4	5	3	
49	47		3	3	5	3	
50	48		4	4	5	3	
51	49		5	5	5	3	
52	50		4	4	4	2	
53							
54							
55							
56							
57							
58							
59							
60							
61							

Data collection | Scale Value | Correlation 1 | +

Appendix E

Computation Sheet



	A	I	J	K	L	M	N	O	P
1	Respondents						Project performance	/Independent Variable	
2		PP2.1	PP2.2	PP2.3	PP2.4	PP2.5	PP3.1	PP3.2	PP3.3
3	1	4	3	3	3	2	1	3	2
4	2	1	1	1	1	2	1	2	3
5	3	2	2	3	4	3	2	3	3
6	4	3	3	3	3	3	3	3	3
7	5	3	3	3	3	3	3	3	3
8	6	3	3	3	4	3	4	3	4
9	7	4	2	2	2	2	3	2	3
10	8	2	2	2	2	3	2	2	2
11	9	2	3	3	2	2	3	2	1
12	10	3	3	3	3	3	2	2	3
13	11	4	3	4	3	4	4	3	3
14	12	3	3	4	2	4	3	3	2
15	13	2	3	3	3	3	4	3	3
16	14	3	3	2	3	3	2	3	3
17	15	3	3	3	3	3	3	2	3
18	16	2	2	3	3	2	2	2	2
19	17	2	3	2	2	2	2	3	3
20	18	4	4	4	3	4	3	4	4
21	19	3	3	3	3	3	2	2	3
22	20	3	3	2	3	3	2	2	3
23	21	3	3	3	2	3	3	3	3
24	22	3	3	3	3	3	4	3	3
25	23	3	2	3	3	3	2	2	2
26	24	2	2	2	2	2	2	2	2
27	25	3	1	1	3	2	4	4	4
28	26	4	2	2	3	3	4	4	4
29	27	3	3	4	3	4	4	4	3
30	28	4	4	4	4	3	4	4	4
31	29	4	3	3	4	2	4	3	3
32	30	2	2	1	2	1	2	2	1
33	31	4	2	3	3	3	3	4	3
34	32	1	2	2	2	1	1	3	2
35	33	2	1	1	2	1	1	2	1
36	34	2	3	2	4	3	3	2	4
37	35	3	4	3	3	4	1	3	4
38	36	2	2	2	2	2	2	2	2
39	37	2	2	3	2	2	2	2	2
40	38	2	3	2	2	3	3	3	3
41	39	3	2	2	3	2	3	2	2
42	40	3	3	3	4	3	3	3	3
43	41	3	2	3	3	2	2	3	3
44	42	1	1	1	1	1	1	1	1
45	43	4	4	3	3	2	4	4	4
46	44	2	2	2	2	2	2	2	2
47	45	4	4	3	4	4	4	3	4
48	46	4	4	4	3	3	2	2	4
49	47	4	2	2	3	3	2	3	4
50	48	4	3	3	3	4	2	3	2
51	49	4	4	4	4	4	4	4	4
52	50	2	4	1	2	2	2	3	4
53									
54		Total Q for PP	14						