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A Quantitative Analysis of Traditional Construction Monitoring and Management Practices and Their Impact on Project Efficiency: Focusing on Site Inspection, Supervision, Communication, and Planning

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ABSTRACT

Construction projects can face a number of problems, such as delays, overspending and waste of resources. Monitoring and administration are necessary for the successful implementation of the initiatives. The purpose of this study was to evaluate the association between the construction industry project efficiency with construction monitoring and management. The study was conducted on 100 participants working in the construction sector, including project managers, supervisors, engineers, contractors, and other field workers. The study adopted a quantitative descriptive correlational methodology. Data were collected using a validated questionnaire with reliability of 0.87. The results show clearly that construction management procedures were implemented on a very large scale and construction monitoring was implemented on a large scale. However, it was found that both field workers and managerial staff had very high efficiency on the project. The results of correlation analysis show that there is a significant positive correlation between construction monitoring and management procedures and project efficiency. The results above indicate that successful projects should contain cooperation, planning, communication, supervision and resource management. The present study has proved the significance of traditional monitoring and management techniques for successful project management.

Keywords: Construction Monitoring; Construction Management; Project Efficiency; Project Performance; Construction Productivity; Resource Management; Project Monitoring; Construction Supervision; Construction Industry; Project Management; Infrastructure Projects.

1.0. Introduction

1.1. Background of the Study

The construction sector remains one of the largest drivers of the country's economic growth because it allows for the construction of public utilities, commercial buildings, residential buildings, transportation networks, and infrastructure. Construction projects are engines of economic growth, as they create jobs, stimulate investment and promote industrial development. But the sector is still suffering from persistent problems such as delays in projects, overspending, waste of resources, safety issues and poor quality.

The level of project efficiency is one of the most important indicators of construction projects success. Efficient projects are completed on time, within financial limits, use available resources in the best possible way, meet quality standards, and involve all project participants. This requires effective construction monitoring and project management.

The idea of construction monitoring is the systematic observation, inspection, documentation and evaluation of activities being performed during the construction process to confirm that there are no deviations from the set plans, specifications, schedules and quality considerations. Construction management, on the other hand, is the planning, arranging, coordinating, directing and regulating of a project's resources.

Recently, digital technology has advanced in areas like Building Information Modeling (BIM), artificial intelligence, drones and sensor-based monitoring systems, altering construction management techniques. However, many construction companies (especially in developing countries) still rely heavily on traditional methods of monitoring and management such as direct supervision, documentation, face to face interaction and physical inspection. Conventional methods are still often used because they are cheap, easy to use and familiar to building professionals.

Although the evolution of technology in construction monitoring has been studied by many academics, there is little empirical research on the impact of traditional monitoring and management techniques on the success of building projects in the modern age. This is particularly valid for construction companies that still rely on traditional project management techniques and have not adopted modern technologies.

Therefore, the aim of the present study is to examine the relationship between construction monitoring and management activities and project efficiency. This is because, the current study measures the degree of influence of conventional supervision techniques, inspection protocols, documentation practices, scheduling, communication and resource management activities on the success of construction projects.

1.2. Research Gap

Much research has been dedicated to the latest technologies of monitoring and management of construction. Recent publications have highlighted the importance of automation, machine learning, digital twins, BIM model integration and data collection systems to improve the performance of building projects. However, traditional monitoring and management techniques are often used in digitalization situations.

Previous studies paid little attention to the effectiveness of traditional management strategies, focusing mainly on new technologies. Moreover, there is little research that statistically explores the role of standard monitoring and management techniques in increasing project efficiency from the perspective of industry professionals and management experts.

This paper will discuss the impact of traditional construction monitoring and management techniques on project efficiency. This study will contribute to the existing literature by offering some empirical data on the importance of employing conventional supervision and management techniques so as to achieve a successful project outcome.

1.3. Theoretical Foundation

This study is anchored on Systems Theory and Project Management Theory.

1.4. Systems Theory

According to the system theory, organizational functions are a system of many sub-components that work together to achieve the organizational goals. A construction project is comprised of several subsystems, like communications, employee performance, resource distribution, managerial tasks, and project monitoring. Any improvement or degradation in the functionality of any sub system will have a significant effect on the overall performance of the project.

In this situation project monitoring is a control process, which provides project management with the information to decide and react to the situation in the right way. Project monitoring allows to identify changes in the project's plans that increase the project's efficiency.

1.5. Project Management Theory

The theory of project management highlights the need to plan, organize, lead, control and monitor the project's operations to achieve pre-defined goals. Effective coordination of human labor, supplies, equipment, funds, and information is fundamental to project management throughout the project.

Project management theory suggests that effective project management strategies include scheduling, supervision, communication, resource allocation, quality control and performance monitoring to achieve successful projects. This approach increases the efficiency of the project in the sense that there are no delays, no waste of resources, increased output, and project success. Using systems theory and project management theory allows an understanding of the impact of monitoring and management strategies on the effectiveness of projects in the construction industry.

1.6. Objectives of the Study

The primary objective of this study is to determine the relationship between construction monitoring and management practices and project efficiency within the construction industry. Specifically, the study seeks to:

1. Determine the level of construction on monitoring practices.
2. Determine the level of construction on management practices.
3. Determine the level of project efficiency.
4. Examine the relationship between construction monitoring and management practices and on the project efficiency.
5. Provide recommendations for improving the project efficiency through effective monitoring and management practices.

2.0. Review of Related Literature and Studies

2.1. Related Literature

2.1.1. Construction Monitoring Practices

Construction project monitoring is an important project management process which enables continuous evaluation of project activities and resource utilization, quality and schedule compliance. According to the study of Manoharan et al. (2023), the supervisory skills are critical to the productivity, sustainability and efficiency of construction projects. The findings of the study revealed that supervisory skills such as labour management, communication, leadership, technical and performance evaluation skills have a positive impact on projects.

Project monitoring is one of the main components of construction project management that provides ongoing evaluation of project activities, resource utilization, quality and schedule compliance. Manoharan et al. (2023)

state that supervision skills are vital to the productivity, sustainability and efficiency of construction projects. The research cites that projects are advantageous from supervisory skills such as labor management, communication, leadership, technical skill and performance assessment. Project monitoring is one of the key components of construction project management that allows continuous evaluation of project activities, resources usage, quality and compliance with schedule. The supervision skills are of great influence on the productivity, sustainability, and efficiency of construction projects, pointed out Manoharan et al. (2023). The study found that supervisory skills such as labour management, communication, leadership, technical proficiency and performance evaluation skills have a positive impact on projects.

Authors Herath and Chong (2021) state that effective planning, monitoring, communication, stakeholder involvement and resource management are important for the success of a project. Their analysis indicated the importance of continuous observation and control of the project process.

2.1.2. Site Inspection and Quality Assurance

The site inspection is one of the most popular methods of monitoring building projects. A study by Xing et al. (2021) indicated that lean construction methods employed in China have demonstrated how workflow management and constant monitoring can significantly improve the productivity and efficiency of construction projects. They recommended ongoing monitoring to reduce waste, eliminate delays and improve collaboration among all project participants.

Bhagwat et al. (2022) suggested the jobsite safety inspection strategy and demonstrated that regular inspections are one of the best methods to improve safety performance. Likewise, Nakanishi and Kaneta (2022) noted that effective monitoring systems lead to better project control and decision-making. Traditional inspection methods are labor intensive but still provide valuable information for project management and operational improvement.

2.1.3. Traditional Construction Management Practices

Rehman et al. (2023) in their review, critically assessed the old construction monitoring techniques and concluded that there are still many cases where old monitoring techniques are still being used, despite the technological advancements. The authors note that supervisory observations, progress reports, and manual inspections continue to be the main monitoring instruments for most construction projects.

Schaufelberger and Holm (2024) state that planning, scheduling, quality control, communication, risk management, and monitoring are required for efficient construction management. They argue that successful construction management enhances the success of the project through the synchronization of the efforts of the various stakeholders.

2.1.4. Resource Management and Project Efficiency

Resource management in a project is the best possible distribution and use of workers, supplies, equipment, funds, and information. According to, Mohamed, (2023), there is a need to ensure efficient management of resources in order to improve project execution. It was concluded that the proper management of human, financial, technological and material resources can lead to improvement in production and efficiency.

Gurmu (2021) research states that project success is dependent on human resource management techniques such as workforce consistency, organizational stability and clear division of responsibilities. The construction productivity can be improved by human resource management techniques and efficient communication systems, as revealed in another research done by Alsumamy et al. (2024). They found that communication supports project operations.

Good labour management (planning, supervision, training and performance evaluation) directly impacts project efficiency and quality performance (Srinivasan et al., 2023)

2.1.5. Construction Productivity and Project Performance

Productivity of construction projects has been regarded as a key component in determining the projects' efficiency. A comprehensive review of literature concerning productivity monitoring in construction projects was conducted by Alaloul et al. (2022). They noticed that continuous productivity monitoring allows for the identification of inefficiencies, better resource allocation, and even the prevention of delays in project execution.

Dixit (2021) study has shown the impact of management practices on the productivity of building projects. The results showed that good project management greatly enhances project efficiency. The emphasis was on things like decision-making, planning, supervision and communication.

Shah et al., 2023 studied the impact of project management on construction cost overruns. The results showed that the major causes of the inefficiency of the projects included poor planning, lack of communication, insufficient monitoring and ineffective risk management.

2.2. Conceptual Framework

The conceptual framework of this study proposes that construction monitoring practices and construction management practices influence project efficiency. Construction Monitoring Practices include:

- Site inspections
- Project supervision
- Monitoring progress
- Documentation and reporting
- Quality monitoring
- Safety monitoring

Construction management practices include:

- Resource management
- Planning and scheduling
- Communication management
- Workforce coordination
- Decision-making process
- Project control mechanism

These independent variables, when taken together, affect the dependent variable known as "Project Efficiency," shown by:

- Project completion on time
- Efficient resource usage
- Project delay prevention
- Increased productivity
- Quality compliance
- Fulfillment of project goals

The model proposes that any improvements in monitoring and management practices lead to improvement in project efficiency.

2.3. Synthesis of Literature

It is evident from the reviewed literature that construction monitoring and management techniques are major factors that influence project success. By employing effective supervision, site inspections, communication strategies and resource management tactics, greater productivity, performance quality, safety compliance and project completion rates can be achieved.

Previous research has suggested that the monitoring process helps managers to acquire the critical information they need to make decisions. Similarly, strong management techniques help coordinate the actions of many stakeholders, allocate resources efficiently and decrease the risk associated with any project.

However, it is evident that traditional monitoring and management procedures continue to be important in the construction practices today, even though many researchers have now started to focus on advanced monitoring techniques such as Building Information Models, artificial intelligence and automated data collection systems. Many firms employ traditional monitoring mechanisms such as supervision, face-to-face contact and physical inspection.

There is a good amount of literature on construction management and monitoring separately but little research on the effect of both on project efficiency. This study aims to fill this gap by analyzing the influence of traditional monitoring and management strategies on the efficiency of building projects. There is a plethora of research in construction management and monitoring in isolation but very little is known about how these two principles work together to improve project efficiency. Research is presently being conducted to bridge this gap and to investigate the relationship between traditional approaches of monitoring and management and project effectiveness.

3.0. Research Methodology

3.1. Research Design

In this study, a quantitative descriptive-correlational research design was used to study the effect of construction monitoring and management procedures on project efficiency. The descriptive part of the study design enabled to

determine the extent of the use of the construction monitoring and management techniques in construction projects. On the other hand, the correlational design component was used to determine a statistical relationship between independent factors and project efficiency. Quantitative design was selected as it provides the opportunity to collect and analyze the numerical data in an objective manner. The architecture allowed researchers to collect real data on the effects of management and monitoring techniques on the project efficiency.

3.2. Research Participants

The study comprised 100 respondents who were actively involved in construction operations. In selecting the respondents, purposive sampling was employed to include only those with sufficient expertise in construction management and monitoring in the study.

The responders were project managers, construction managers, site engineers, supervisors, foremen, contractors, administrative staff, carpenters, laborers, painters and general construction workers. The range of responses gave a good sense of management and monitoring issues. The demographic distribution of the respondents is shown in Table 1.

Table 1. Distribution of Respondents According to Position.

Position Category	Frequency (f)	Percentage (%)
Management and Supervisory Personnel	31	31.0
Field Construction Workers	69	69.0
Total	100	100.0

The data revealed that 69% of the sample were field workers and 31% were management and supervisory staff.

3.3. Research Instrument

Data was collected through a structured questionnaire designed by the researcher with three main sections:

Section A: Demographic Profile This section gathered information regarding respondents' positions and categories within construction organizations.

Section B: Construction Monitoring and Management Practices This section examined the respondents' views on the application of monitoring and management techniques such as site inspections, project supervision, documentation protocols, scheduling activities, communication channels and resource management techniques.

Section C: Project Efficiency This section measured respondents' perception of project efficiency indicators including productivity, quality performance, resource utilization, schedule compliance and project completion success using a five-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree).

Table 2. Likert Scale Interpretation.

Scale	Range	Interpretation
5	4.21–5.00	Very High
4	3.41–4.20	High

3	2.61–3.40	Moderate
2	1.81–2.60	Low
1	1.00–1.80	Very Low

3.4. Validity and Reliability

The tool's content validity was evaluated by construction management and methodological experts. Their recommendations were incorporated into the tool to enhance its relevance and clarity. A pilot study was conducted among twenty construction workers before the actual data collection. They were not in the last sampling. The tool reliability was measured through the Cronbach's Alpha value which was 0.87. This value indicates a sufficient degree of consistency and points to the suitability of the instrument for data collection.

Table 3. Reliability Analysis.

Instrument	Cronbach's Alpha	Interpretation
Survey Questionnaire	0.87	Highly Reliable

The obtained reliability coefficient exceeded the commonly accepted threshold of 0.70, indicating satisfactory reliability for research purposes.

3.5. Data Collection Procedure

Before collecting data, necessary permissions were obtained from relevant construction organizations and project staff. The respondents were informed about the study's goal and assured that their participation was entirely optional.

Questionnaires could be completed either on paper or online using Google Forms. Respondents were given enough time to finish the questionnaire. Completed questionnaires were checked for discrepancies or missing responses before the data processing. The data collected from the respondents was coded in Microsoft Excel.

Ethical Considerations

The study complied with established ethical standards for research involving human participants. Specifically:

- Participation was voluntary.
- Informed consent was obtained from all the respondents.
- Confidentiality and anonymity were maintained throughout the study.
- No personally identifiable information was disclosed.
- Data were used exclusively for academic and research purposes.

The study also complied with the provisions of Republic Act No. 10173, otherwise known as the Data Privacy Act of 2012.

Statistical Treatment of Data

The following statistical tools were utilized:

Frequency and Percentage

Frequency and percentage distributions were used to describe the demographic profile of respondents.

Weighted Mean

Weighted mean was used to determine the level of implementation of construction monitoring practices, construction management practices and project efficiency indicators.

The weighted mean was computed using the formula; WM = Σfx N Where: WM = Weighted Mean Σfx = Sum of weighted responses N = Total number of responses Pearson Product-Moment Correlation Coefficient Pearson's Product-Moment Correlation Coefficient (r) was used to determine the strength and direction of the relationship between the construction monitoring and the management practices on project efficiency.

The level of significance was set at $\alpha = 0.05$.
The decision criteria were as follows:

Reject H_0 if $p < 0.05$

Fail to reject H_0 if $p \geq 0.05$

The correlation coefficient was interpreted using the following guidelines:

Table 4. Interpretation of Correlation Coefficients.

Correlation Coefficient (r)	Interpretation
0.00–0.19	Very Weak
0.20–0.39	Weak
0.40–0.59	Moderate
0.60–0.79	Strong
0.80–1.00	Very Strong

These statistical techniques helped the research team to meet the objectives of their research and to test the hypotheses they had developed in relation to the effect of construction monitoring and management on efficiency.

4.0. Results and Discussion

4.1. Respondent Profile

The survey was conducted on 100 professionals and construction workers from various building projects. 31% of the respondents for the questionnaire were managers and supervisors, and 69% were field construction workers. The views of respondents from different organizational levels enabled us to assess the methods of construction monitoring and management from the operational and strategic perspectives. The results were more dependable because the employees were involved in the planning, management, coordination and execution of the project.

4.2. Construction Monitoring Practices

The first objective of the study was to determine the level of construction monitoring practices implemented within construction projects.

Table 5. Weighted Mean Scores of Construction Monitoring Practices Among Construction Industry Respondents.

Indicator	Weighted Mean	Interpretation
Construction activities are monitored regularly on-site	4.20	High
Site inspections are properly conducted during construction activities	4.22	Very High
Project progress is regularly checked and evaluated	4.09	High
Problems and delays are identified early through proper monitoring	4.17	High
Safety practices are properly observed on construction sites	4.13	High
Construction work is regularly checked to maintain quality standards	4.16	High
Daily construction activities are properly recorded and documented	3.29	Moderate
Monitoring helps ensure that construction activities follow project plans	4.17	High
Overall Weighted Mean	4.05	High

Discussion

The above results indicate that construction monitoring measures were very well applied with a weighted mean of 4.05. Site inspections received the highest mean rating (WM=4.22) indicating that physical inspections are still one of the most important monitoring methods in building projects. These results are in agreement with the findings of Bhagwat et al. (2022) regarding the significance of inspections for effective project operations and safety.

Higher ratings for quality inspections, safety compliance and project monitoring further indicate that respondents recognize the importance of monitoring as a key component of successful projects. By applying proper monitoring procedures, the project manager may detect any deviations from the plan and project progress and take corrective actions.

On the other hand, the least grades were recorded in record keeping and documentation (WM=3.29). This indicates that the method received a mediocre rating. The manual technique of data recording is particularly time-consuming and thus, documentation is still difficult for many construction companies. The results show extensive use of

traditional monitoring techniques and the need for more advancement in the documenting process to improve the effectiveness of monitoring.

4.3. Construction Management Practices

The second objective of the study was to assess the extent of construction management techniques observed in building projects.

Table 6. Level of Construction Management Practices.

Indicator	Weighted Mean	Interpretation
Materials and equipment are properly managed during construction	4.71	Very High
Proper management improves coordination among workers	4.71	Very High
Construction schedules are properly followed during projects	4.45	Very High
Project resources are used efficiently during construction	4.65	Very High
Proper management helps minimize project delays	4.77	Very High
Communication among workers and project personnel is effective	4.74	Very High
Construction problems are handled properly during projects	4.55	Very High
Construction work is organized properly during projects	4.68	Very High
Decisions related to construction activities are handled effectively	4.58	Very High
Overall Weighted Mean	4.65	Very High

Discussion

The above statistics it is evident that construction management processes have been applied at a very high level with weighted mean for all the criterion being 4.65. The highest ratings were for effective communication (WM=4.74), and the ability of management techniques to reduce project delays (WM=4.77). It shows how management needs to be able to co-ordinate and communicate to make a project effective and run smoothly.

Effective communication is the means for the coordination of efforts, resolving issues and sharing information. Good scheduling and resource allocations can help firms to avoid disruption that might impair project

performance. The study of Schaufelberger & Holm (2024) states that construction projects should include suitable planning, scheduling, communication, resource management and project controls and this finding is substantiated by this finding. The aggregate grade of indicators is high which means that respondents believe that managerial tasks help to complete projects successfully.

4.4. Project Efficiency Assessment

The third objective was to determine the level of project efficiency.

Table 7. Project Efficiency Assessment: Management and Supervisory Personnel.

Indicator	Weighted Mean	Interpretation
Proper management improves quality of construction work	4.55	Very High
Construction errors and rework are minimized through proper management	4.65	Very High
Project management helps complete projects successfully	4.84	Very High
Proper management helps maintain workplace safety	4.68	Very High
Management practices improve overall project productivity	4.58	Very High
Proper management helps achieve project goals	4.65	Very High
Overall Weighted Mean	4.66	Very High

Discussion

Project efficiency received a very high rating by the management personnel (WM = 4.66). The maximum rating was attained for successful project completion (WM = 4.84). This shows great assurance in the effectiveness of management practices in attaining the project goals.

The findings provide validation of the Project Management Theory, which states that project success comes as a result of effective planning, organizing, directing, and control of project activities.

Table 8. Project Efficiency Assessment: Field Construction Workers.

Monthly Income Range	Frequency (f)	Percentage (%)
Below ₱10,000	16	19.0
₱10,000 – ₱20,000	21	25.0
₱20,001 – ₱30,000	6	7.1

₱30,001 and above	4	4.8
Prefer not to say	37	44.0
Total	84	100.0

Discussion

Moreover, field workers reported a very high project execution efficiency (WM = 4.22). The fourth objective was to establish if there is a significant relationship between construction monitoring and management techniques and project efficiency. The most important indicators were good construction performance and successful project completion (both WM = 4.38). This shows that the workers involved in the construction work consider the monitoring system as essential in ensuring productivity and avoiding any interruptions. The perceptions of managers and employees are similar, which adds to the validity of the results.

Table 9. Correlation Analysis Between Construction Monitoring and Management Practices and Project Efficiency.

Variables	Pearson r	p-value	Interpretation
Construction Monitoring and Management Practices vs. Project Efficiency	0.72	<0.001	Strong Positive Significant Relationship

Discussion

The p-value obtained is less than 0.001 which is significantly lower than the predetermined threshold of 0.05, hence the null hypothesis is rejected. The research also revealed a Pearson correlation coefficient of r = 0.72, indicating a positive relationship between project efficiency and construction monitoring and management.

Projects with good supervision, inspection, communication, scheduling and resource management are more productive with better monitoring and management methods.

Finally, the findings are in agreement with previous studies that pointed to resource management, monitoring, communication and supervision as key success factors in the implementation of construction projects.

5.0. Summary, Conclusion and Recommendations

Conclusion

The study examined the impact of construction monitoring and management techniques on project efficiency. The findings show that construction monitoring and management techniques are performed at a good level of management and high level of monitoring, and also that field workers and management staff also rate the project's efficiency quite highly.

The main finding of this study is that there is a positive and statistically significant relationship between construction monitoring and management techniques and project efficiency ($r = 0.72$, $p < 0.001$). The study also revealed that scheduling, supervision, communication, resource management and site inspection were perceived as the key elements for successful project implementation. The growing digitalization of the construction industry does not reduce the importance of traditional methods of monitoring and control for project coordination, quality assurance, safety standards and efficiency.

The findings support the two theories in test, Project Management Theory and Systems Theory. This is because, in both theories, the importance of effective management control and synchronization of organizational processes for the achievement of the project goals is emphasized. The study also highlights the fact that good management and oversight of construction firms lead to better project efficacy and efficiency.

Practical Effects

The practical implications of this study for contractors, policy makers, construction companies and construction managers are as follow.

For construction managers: Construction managers need to continue to develop monitoring methods such as performance measurement, project evaluation, site inspections and project appraisals. Supervision is an important technique to give early detection of problems in the project.

For Project Owners and Contractors: Project owners and contractors must develop management systems that enable collaboration, planning, communication, and resource management. Effective management systems ensure efficiency and performance of the project.

Concerning Construction Workers: The results suggest the importance of employees' participation in the reporting and monitoring functions. Employees are important sources of information for initiatives.

To Industrial Stakeholders: The study findings can provide a scientific basis for financing management and monitoring measures that will improve the performance and efficiency of the projects.

To Academic Institutions: Implications for engineering education programs and construction management programs include the potential to improve teaching of resource management, leadership, communication, project monitoring and supervision.

6.0. Limitations of the Study

There are several limitations that need to be considered when interpreting the findings of the study. First, the study was based on self-perceptions of the respondents through survey questions. Second, the study used a purposeful sampling which would limit the generalizability of the results beyond the project areas and participating organizations. Actual performance may not align with perceptions of project performance measures. Second, the study is on monitoring and management techniques and does not compare these techniques with the efficacy of digital technologies like project management tools, BIM technology, artificial intelligence and drones for monitoring. Third, project efficiency was quantified by perception metrics, not project performance metrics, such

as real-time project completion, cost variation, productivity statistics and quality inspection findings. And lastly, the study only investigated the association between monitoring and management techniques. The study did not consider factors such as corporate culture, leadership style, contractor capacity, project complexity, and environmental factors that all affect project performance.

6.1. Recommendations

Based on the study findings and conclusions, the following recommendations are made:

1. Strengthen monitoring systems

To reduce operational risks, Construction organizations should perform regular monitoring activities to ensure that project controls are in place and are working properly.

2. Improve Documentation Practices

Monitoring showed that the documentation process received the lowest scores and therefore it is essential to improve information management procedures in projects.

3. Enhance communication systems

The project managers should develop an efficient communication system to ensure cooperation among project stakeholders.

4. Make an Investment in Supervision Development

Project supervisors and managers should be trained in project controls and other relevant skills.

5. Blend Digital and Traditional Monitoring Methods

Construction companies should think about implementing new monitoring systems which combine digital and traditional methods.

6. Conduct Comparative Studies

Further research should compare the effectiveness of technological versus conventional monitoring techniques to determine the best course of action.

7. Broaden the Scope of Research

Future studies should consider large sample sizes and a variety of geographic locations.

6.2. Contribution to knowledge

The present study contributes significantly to the growing body of knowledge in construction project management by providing empirical evidence on the applicability of conventional project management methods in contemporary construction settings.

The importance of traditional methods for scheduling, communication, supervision and resource management may have overlooked the efficiency of projects as most researchers have focused on automation and digital

transformation. Thus, the present research provides interesting insights for companies which are shifting from traditional project management approaches to technology-based management systems.

Declaration

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Competing Interests Statement

The authors declare no conflict of interest regarding the publication of this manuscript.

Consent for Publication

All authors have read and agreed to the published version of the manuscript.

Authors' Contributions

All authors contributed equally to the conceptualization, data collection, analysis, and writing of this manuscript.

Informed Consent

Informed consent was obtained from all participants prior to their participation in the survey. Participation was entirely voluntary and anonymous.

Availability of Data and Material

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Institutional Review Board Statement

Not Applicable. The study involved voluntary, anonymous online survey participation with no identifying information collected and no physical or psychological risk to participants.

Ethical Approval

The study was conducted in accordance with established ethical principles for research involving human participants. All participants provided digital informed consent before accessing the survey instrument.

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Declaration of Artificial Intelligence

The authors declare that no artificial intelligence tools were used in the writing, data analysis, or interpretation of findings in this manuscript. All content was produced solely by the authors.

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