Journal of Civil and Construction Engineering Research (JCCER)
Volume 2, Issue 2, Date: 31 - December – 2025
ISSN: 2978-4476, DOI: 10.64820/AEPJCCER.22.1.6.122025

Practices on Project Performance: A Comparative Analysis of Traditional and Lean Construction Methods in Selected Construction Companies in Metro Manila

Dante Silva [1], Kristine Joy Marie Abaña [2], Erikca Marie J. Cañete [3], John Kenneth Grapa [4]
[1, 2, 3, 4] Bachelor of Science in Civil Engineering, Mapua University Intramuros, Manila City, 1002, Philippines
Email: [2] kjmsabana@mymail.mapua.edu.ph, [3] emjcanete@mymail.mapua.edu.ph, [4] jklgrapa@mymail.mapua.edu.ph

Abstract- ***Construction practices in Metro Manila predominantly rely on traditional methods, with lean construction still not widely adopted or recognized in the Philippines. This comparative analysis investigates the impact of these two approaches on project performance within selected construction companies in the region. The research explores the differences in implementation, identifies construction workers' perceptions of their performance under each method, and evaluates the effects of lean construction practices compared to traditional methods. The study also assesses work efficiency and performance improvements using lean and traditional methods in terms of quality, time, and cost—the three critical project management control variables. A comparative quantitative research design is employed, focusing on construction workers and professionals within the region. Data is collected using a structured questionnaire, designed to capture detailed insights into participants' perceptions of both construction methods. Statistical analysis, including the Kruskal-Wallis test and correlation coefficient, will be applied to evaluate differences and correlations between the two methods. The findings aim to provide insights for improving construction practices based on the comparative outcomes of lean and traditional construction approaches.***

Keywords: Lean construction, Performance Improvement, Construction Industry, Traditional Construction, Construction Practices.

I. INTRODUCTION

The primary challenge for the global construction sector is to increase productivity and innovation. The global economy largely depends on the tangible contributions made by the construction industry. It makes a sizeable contribution to GDP according to (Ahmed & Ahmed,2018). Although market conditions have become more uncertain since the financial crisis of 2008, this has increased pressure on construction enterprises to provide a fresh plan to improve the current manufacturing system. High variability, subpar performance, and an unsafe workplace are traits of the construction sector [1], [2], [3].

According to (Maske & Valunjkar, 2020), productivity in the construction sector has been dropping globally over the past few decades. High levels of waste, frequent delays, cost overruns, and issues with quality control that impair overall effectiveness are just a few of the challenges the construction sector routinely faces. Because of this, the construction industry requires a radical change rather than a gradual one to address the issues and difficulties it is currently facing and ensure that projects are finished within a predetermined budget and duration and with the specified quality commonly referred to as project management [4], [5]. The use of a variety of innovations by the industry to stay competitive can be linked to and associated with more significant risks due to the novelty or unfamiliarity of approaches and methods. This circumstance or issue gives rise to a comparison of traditional and lean construction techniques in Metro Manila's selected construction companies [6], [7], [8].

To illustrate the difference between the lean construction method and traditional construction, a thorough comparison study will be carried out, focusing on the level of the following variables: performance practices related to their implementation approach, work efficiency, and perception of stakeholders [9], [10] [11], [12]. The two most crucial management strategies in the building sector are traditional ideas and lean construction. The main objective of this study is to compare lean construction to traditional construction, see which approach is more effective, and ascertain whether lean construction affects project performance practices in Metro Manila's selected construction companies or vice versa [13], [14], [15].

II. METHODOLOGY

The respondents are divided into a non-probability sample. In non-probability sampling, there is an assumption that there is an even distribution of characteristics within the population; thus, any sample will be representative, and because of that, results will be accurate. The purposive sampling method was used to select respondents for the study. This study employs a comparative quantitative research design to identify workers' perceptions of traditional and lean construction methods in the Philippines. This design is used to quantify the problem by producing numerical data that can be converted into usable statistics. It focuses on the selected construction areas. The researchers used the

Received: 11-7-2025
Revised: 22-12-2025
Published: 31-12-2025

Statistical Package for Social Sciences (SPSS) to compute the comparison as a tool to determine the differences between traditional and lean construction methods in terms of the worker's perception, work efficiency, and effectiveness [16], [17], [18], [19].

The data collection method for this research topic would involve using a structured questionnaire to measure the participants' perceptions of traditional and lean practices. This process would be done to ensure the participants' anonymity and confidentiality. The data can be analyzed using the Kruskal-Walliss test, a statistical technique that compares independent groups for differences in their medians: traditional, lean construction, and hybrid (lean & traditional) [20], [21], [22], [23], [24]. A correlation coefficient will be calculated to determine the level of comparison between the three variables[25-31]. Based on the results of the comparative analysis, conclusions can be drawn regarding the comparative analysis of Traditional and Lean construction methods in selected construction companies in Metro Manila. The findings can be used to make recommendations for improving the method used in the construction industry [32], [33], [34], [35].

III. Results And Discussion

A. General Information

This chapter presents the information obtained from the questionnaire responses provided by the participants, together with an analysis and interpretation of the data. The aforementioned information was supplied in tabular form in accordance with the specific questions asked in the problem description.

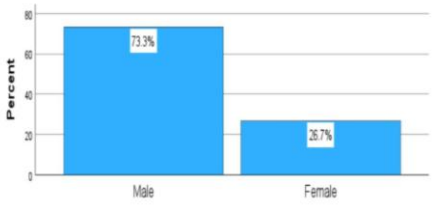

Fig 1. Gender of the Respondents

Based on the bar graph shown, out of the total 30 respondents, there are 22 male respondents (73.3%) and 8 female respondents (26.7%). Therefore, the majority of the respondents are males who answered the survey.

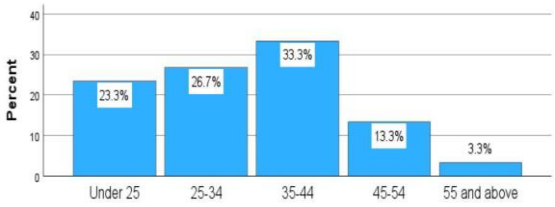

Fig 2.Age of the Respondents

Based on the survey, the respondents' ages are shown in the bar graph. 10 respondents (33.3%), or those in the 35–44 age range, make up the largest group. The following are 8 respondents (26.7%) in the 25–34 age group and 7 respondents (23.3%) in the under-25 age group. 4 respondents (13.3%) fall into the 45–54 age range, and one respondent (3.3%) falls into the 55 and above category

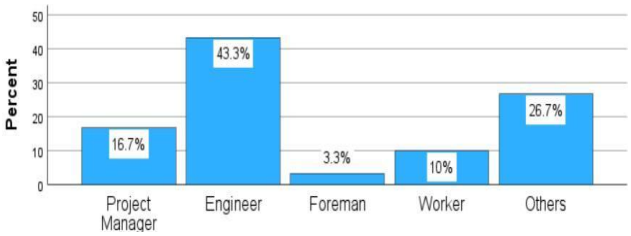

Fig 3. Respondent's Role in the Construction Industry

The respondents' roles in the construction industry are summarized in the graph. 13 (43.3%) of the 30 respondents are engineers, making up the largest group. 11 respondents (26.7%) who play a variety of roles outside the predetermined categories make up the second-largest group. Out of the total respondents, 5 respondents (16.7%) are project managers, while three respondents (10%) are workers. Foremen have the smallest group, with 1 response (3.3%). The distribution among the 30 respondents shows the range of roles in the construction industry.

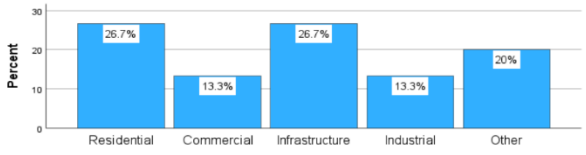

Fig.4. Type of Construction Project

The bar graph displays the respondents' involvement in various construction projects. According to the statistics, residential projects are worked on by 8 respondents (26.7%), making these and infrastructure projects the most common project kinds. Additionally, 8 respondents (26.7%) are involved in infrastructure projects. Among the respondents, 4 (13.3%) worked on commercial projects and 3 (10%) on industrial projects. 6 respondents (20%) also mentioned working in various categories. This distribution shows the variety of projects that the respondents are working on in the construction industry.

B. Interpretation and Analysis of Data per Objective

The only significant finding in Table 1 is related to Project Delays ($p = 0.039$), indicating that there may be more effective handling of delays in lean construction practices compared to traditional methods. This suggests that lean construction might lead to better scheduling and resource allocation, ultimately reducing delays. Other issues like Cost Overruns, Poor Quality of Work, and Material Waste show no significant differences, implying that both methods face similar challenges in these areas.

Table 1. Project Performance and Traditional Construction Practices: Commonly Encountered Issues

Values	Kruskal-Wallis H	df	p-value (Asypm. Sig.)	Interpretation
Project Delays	8.389	3	0.039	Significant difference; lean construction may handle delays better.
Cost Overruns	2.210	3	0.530	No significant difference; similar challenges in both methods
Poor quality of work	3.646	3	0.302	No significant difference; quality issues persist in both methods.
Material Waste	2.21	3	0.530	No significant difference; waste management similar in both.
Rework or Revisions during construction	3.726	3	0.293	No significant difference; rework issues are common in both.
Inefficient communication among teams	1.778	3	0.620	No significant difference; communication challenges exist in both.

Table 2. Project Performance and Traditional Construction Practices Strategies

Values	Kruskal-Wallis H	df	p-value (Asypm. Sig.)	Interpretation
Improving team communication	4.359	3	0.225	No significant difference; team communication efforts are similar
Strict budget management	1.616	3	0.656	No significant difference; budget management practices are alike
Monitoring project timelines closely	3.247	3	0.355	No significant difference; timeline monitoring strategies are similar.
Reducing material waste	2.567	3	0.463	No significant difference; similar approaches to waste reduction.
Rework or corrections when issues arise	6.438	3	0.092	Marginally significant; potential for differences in rework handling.

Table 2 also shows no significant differences in most areas, suggesting that both traditional and lean construction methods face similar challenges in terms of communication, budget management, and timeline monitoring. The marginally significant finding for Rework or Corrections ($p = 0.092$) indicates that there may be potential differences in how rework is handled in lean vs. traditional settings, which could be further explored in future research.

Table 3. Lean Practices Used or Encountered in Construction Projects

Values	Kruskal-Wallis H	df	p-value (Asypm. Sig.)	Interpretation
Minimizing material waste (ordering only the necessary amount of materials)	2.567	3	0.463	No significant difference; waste minimization efforts are alike.
Organizing workflow to reduce downtime between tasks	3.013	3	0.390	No significant difference; workflow organization is comparable.
Reviewing processes to continuously improve work efficiency	11.013	3	0.012	Significant difference; lean practices may improve efficiency

The significant result for Reviewing Processes for Efficiency ($p = 0.012$) suggests that lean construction practices are associated with a continuous improvement mindset that may lead to greater efficiency compared to traditional practices. This aligns with the objectives of your study by highlighting the benefits of lean principles in enhancing operational efficiency.

Table 4. Openness to Adopting Practices for Improved Project Performance

Values	Kruskal-Wallis H	df	p-value (Asypm. Sig.)	Interpretation
Open to adopting these practices to improve project performance	1.304	3	0.728	No significant difference; willingness to adopt lean is similar.

The lack of a significant difference in openness to adopting lean practices suggests that both traditional and lean-oriented professionals have similar attitudes towards the adoption of lean methodologies. This may indicate a potential area for further education and training to increase adoption rates.

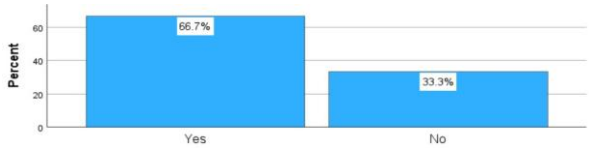

Fig .9. Awareness of Lean Construction and its Principles

The analysis reveals that a significant majority of construction professionals in the region are aware of lean construction principles, with 66.7% indicating familiarity. That would imply that the industry has experience with lean practices and has seen positive outcomes. However, 33.3% of respondents reported no knowledge of lean construction, indicating they are only familiar with and have experience with Traditional construction.

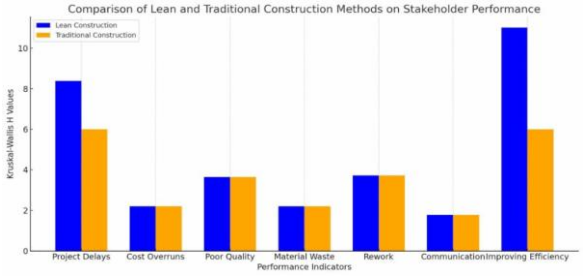

Fig. 10. Comparison of Lean and Traditional Construction Methods on Stakeholder Performance

Fig. 11. Effect of Traditional and Lean Construction Practices on Stakeholder Performance

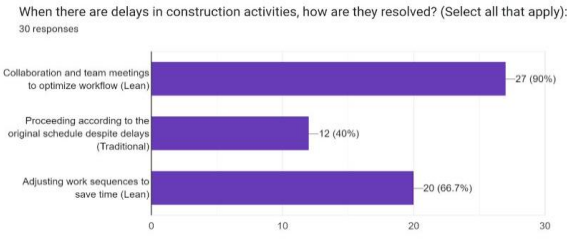

Fig. 12. Results on how delays are resolved

Lean Approach: 56.7% of respondents stated that team collaboration and adjusting work sequences are the primary strategies for managing delays in projects. These are key elements of lean construction, emphasizing adaptability and proactive problem-solving. Traditional Approach: 43.3% of respondents mentioned that rework and additional labor are their go-to methods for resolving delays, which is more reactive and often adds to project costs and time.

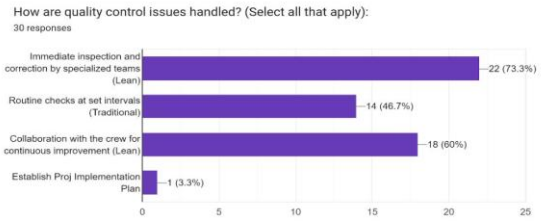

Fig. 13. Results on how quality control issues are handled

Lean Approach: 53.3% of participants indicated that immediate inspections and continuous monitoring are their preferred lean techniques for ensuring quality. This aligns with Lean's focus on reducing defects and ensuring quality at every stage of the project. Traditional Approach: 46.7% use post-construction inspection as their main quality control mechanism, which typically results in rework if issues are found, thus increasing costs and time.

Lean Approach: 60% of respondents reported actively managing material usage and reducing waste through methods like just-in-time delivery, a lean practice aimed at minimizing excess inventory and material waste.

Traditional Approach: 40% of participants said they dealt with waste by ordering extra materials to account for potential wastage, which is less efficient and leads to higher project costs.

Fig. 14. Results on how quality control issues are handled

The pie chart provides insights into how respondents view their team's overall efficiency under both methods. Although 50% consider their team efficient, 43.3% feel neutral, suggesting that while traditional methods are in use, there is a general perception that efficiency can improve.

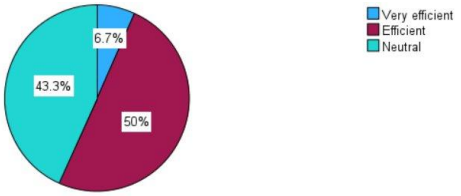

Fig. 15. Overall Efficiency Rating on team performance in traditional practices

C. *Project Performance Issues*

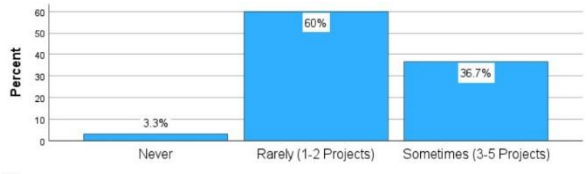

Fig. 16. Delay Frequency

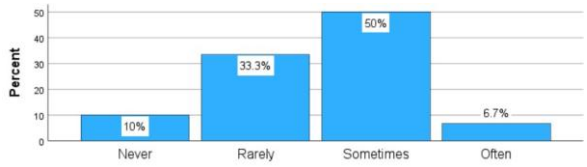

Fig. 17. Budget Overruns Frequency

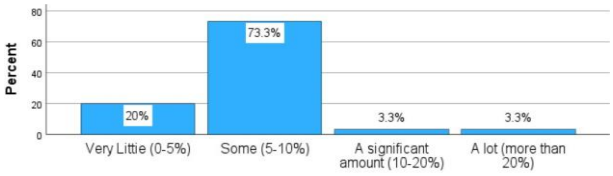

Fig. 18. Material Wasted

D. *Project Performance Resolution*

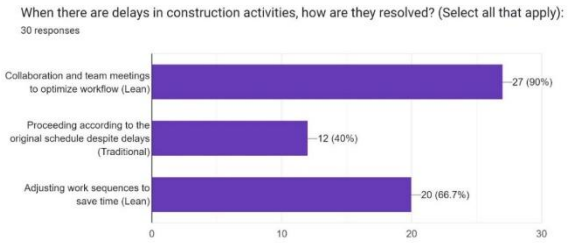

Fig. 19. Delay problem resolution

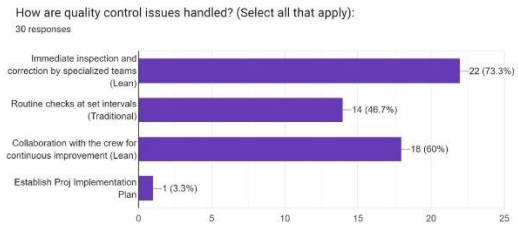

Fig. 20. Quality control resolution

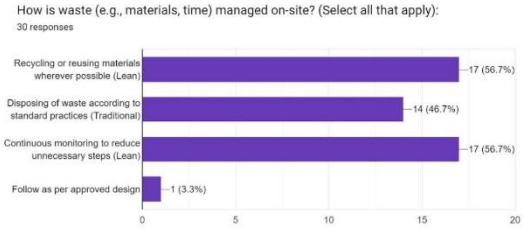

Fig. 21. Material waste resolution

The survey data shows that construction projects in Metro Manila face several important problems, such as delays, going over budget, and wasting materials. These problems are common and usually happen because of traditional construction methods, which follow a step-by-step process and focus on making decisions from one central place. This way of working can cause inefficiencies, slow communication, and trouble coordinating different tasks and resources, which can lead to poor project results.

Delays in traditional methods often happen because of misunderstandings, poor coordination between teams, and unexpected changes in the construction schedule. This method relies on strict, linear processes that can be hard to manage when unexpected changes happen. The lack of flexibility in quickly addressing problems can lead to longer project times, which then cause budget overruns due to increased labor costs.

Spending more than planned is a common problem, especially with traditional methods that wait for issues to happen instead of preventing them. When unexpected problems come up, they need extra money, supplies, and time to fix, causing costs to rise. Traditional construction, which works step by step, doesn't allow for early detection of ways to save money or use resources better, which could have helped avoid these extra costs. Waste materials are another big issue with traditional construction. The emphasis on making lots of the same thing and having one central control often leads to ordering too much material, not handling it well, and having trouble with getting rid of the extra. This creates a lot of waste, which not only costs more but also harm the environment, making it harder for construction projects to be sustainable.

IV. CONCLUSION

Facing these difficulties, such as delays, going over budget, and wasting materials, the survey results highlight the immediate need for construction companies in Metro Manila to rethink their project management strategies. While traditional methods are widely recognized and familiar to industry professionals, our findings suggest that Traditional management method may not be the most optimal approach to achieving successful project outcomes.

To solve the ongoing construction problems, based on our study, using lean construction principles is more efficient than traditional principle. Lean construction generally seems to be more effective than traditional methods in handling project delays and improving efficiency through process evaluations. By implementing strategies like Just-in-Time (JIT) delivery and the Last Planner System (LPS), lean construction can significantly reduce delays, improve quality, and minimize waste. However, the application of LPS and JIT delivery is still in its early stages but is gaining attention due to the potential benefits it brings in reducing delays, improving efficiency, and fostering collaboration.

Moreover, both approaches encounter similar problems with cost increases, work quality, and material waste. So, while lean construction shows benefits in certain areas, its overall effectiveness can differ based on the specific issues it tackles. To boost efficiency, a combined approach that uses lean principles while also dealing with common problems in traditional methods might be helpful. Lean construction techniques provide notable benefits in terms of performance enhancement compared to traditional methods, especially in managing delays, ensuring quality, and cutting waste. This indicates that lean methods lead to better overall project efficiency and worker performance.

References

[1] Adamska, B.A., Blahak, D., Abanda, F.H. (2021). Blockchain in Construction Practice. In: Ahmed, S.M., Hampton, P., Azhar, S., D. Saul, A. (eds) Collaboration and Integration in Construction, Engineering, Management and Technology. Springer. https://doi.org/10.1007/978-3-030-48465-1_57

[2] Ahmed, A. M., & Ahmed, M. E. a. M. (2018). A Critical Review of Lean Construction for Cost Reduction in Complex Projects. ResearchGate. https://www.researchgate.net/publication/352715342

[3] Ahmed, S., Hossain, M.M., & Haq, I. (2021). Implementation of lean construction in Bangladesh: Awareness, benefits, challenges. International Journal of Building Pathology and Adaptation, 39(2), 368–406. https://doi.org/10.1108/IJBPA-04-2019-0037

[4] Akinosho, T. D., Oyedele, L. O., Bilal, M., Ajayi, A. O., Delgado, M. D., Akinade, O. O., & Ahmed, A. M. (2020). Deep learning in the construction industry. Journal of Building Engineering, 32, 101827. https://doi.org/10.1016/j.jobe.2020.101827

[5] Amri, T., & Marey-Pérez, M. (2020). Delays and cost overruns in Oman construction projects. Journal of Project Management, 5(2), 87–102. https://doi.org/10.5267/j.jpm.2020.1.001

[6] Ashrafian, T., Yılmaz, Z., & Moazzen, N. (2019). Energy & cost improvement strategy for existing buildings in Turkey. E3S Web Conf, 111, 03040. https://doi.org/10.1051/e3sconf/201911103040

[7] Babalola, O., Ibem, E. O., & Ezema, I. C. (2019). Lean practices in construction: Systematic review. Building and Environment, 148, 34–43. https://doi.org/10.1016/j.buildenv.2018.10.051
[8] Bajjou, M. S., & Chafi, A. (2018). Effectiveness of lean principles: Input-output model. Journal of Mechanical Engineering and Sciences, 12(4), 4141–4160. https://doi.org/10.15282/jmes.12.4.2018.12.0358
[9] Bamfo-Agyei, E., Thwala, D. W., & Aigbavboa, C. (2022). Performance improvement for labour-intensive works. Buildings, 12(10), 1593. https://doi.org/10.3390/buildings12101593
[10] Dejaco, M. C. (2020). Traditional and lean construction management: A comparison analysis. https://www.politesi.polimi.it/handle/10589/165401
[11] Demirkesen, S. (2021). From Lean Manufacturing to Lean Construction. IntechOpen. https://doi.org/10.5772/intechopen.96191
[12] Eloranta, J. (2021). Changing traditional construction with modular design platforms. LUTPub. https://lutpub.lut.fi/handle/10024/162269
[13] Fitriani, H., & Ajayi, S. (2023). Enhancing sustainable construction practices in Indonesia. Engineering, Construction and Architectural Management, 30(6), 2602–2620. https://doi.org/10.1108/ECAM-11-2021-1051
[14] Gehlot, M., & Shrivastava, S. K. (2021). Sustainable construction practices: Indian perspective. Materials Today: Proceedings, 61, 315–319. https://doi.org/10.1016/j.matpr.2021.09.493
[15] Hamzeh, F., González, V. A., Alarcon, L. F., & Khalife, S. (2021). Lean Construction 4.0. IGLC 29, 207–216. https://doi.org/10.24928/2021/0181
[16] Jayawardana, J., Sandanayake, M., Jayasinghe, J. A. S. C., Kulatunga, A. K., & Zhang, G. (2023). LCA of prefabricated vs traditional construction. Journal of Building Engineering, 72, 106550. https://doi.org/10.1016/j.jobe.2023.106550
[17] Martinez, E., Reid, C. K., & Tommelein, I. D. (2019). Lean construction for affordable housing. Construction Innovation, 19(4), 570–593. https://doi.org/10.1108/CI-02-2019-0015
[18] Maske, N. B., & Valunjkar, S. S. (2020). Lean construction tool – literature review. ResearchGate.
[19] Mellado, F. R. M., & Lou, E. (2020). BIM, lean, and sustainability integration. Sustainable Cities and Society, 61, 102355. https://doi.org/10.1016/j.scs.2020.102355
[20] Mohamed, A. F. (2020). Traditional vs modern building techniques in Egypt. Case Studies in Construction Materials, 12, e00311. https://doi.org/10.1016/j.cscm.2019.e00311
[21] [21] Mostafa, M., Karim, O., & Ahmmed, M. (2021). BIM implementation on existing structure. https://icpaceruet.org/wp-content/uploads/2021/10/ICPACE_2021_CE-104.pdf
[22] [22] Nduati, P., Kariuki, P., & Wanjohi, P. (2021). Sustainable strategic management in construction. African Journal of Emerging Issues, 3(4), 44–57.
[23] [23] Nikjow, M. A. (2018). Traditional construction in Afghanistan. International Journal of Economics and Management Sciences, 7(1). https://doi.org/10.4172/2162-6359.1000506
[24] [24] Nwaki, W., & Eze, C. E. (2020). Lean construction as solution for poor performance. JETIA, 6(26). https://doi.org/10.5935/jetia.v6i26.723
[25] Ogungbile, A. J., & Oke, A. E. (2018). Sustainable construction in West Africa. In Energy, Environment, and Sustainability (pp. 3–15). Springer. https://doi.org/10.1007/978-981-13-3284-5_1
[26] Parfenova, E. N., Avilova, Z. N., & Ganzha, A. N. (2020). Lean construction as effective management. IOP Conf. Series: Materials Science and Engineering, 945, 012012. https://doi.org/10.1088/1757-899X/945/1/012012
[27] Rose, W. A. (2019). Application of Lean Principles and Performance Improvement of Construction Projects. Theseus.
[28] Senarathna, D. R., & Perera, B. L. S. H. (2021). Managing concrete wastes. World Construction Symposium, 413–421. https://doi.org/10.31705/WCS.2021.36
[29] Shaqour, E. N. M. (2021). Adoption of lean construction in Egypt. Ain Shams Engineering Journal, 13(2), 101551. https://doi.org/10.1016/j.asej.2021.07.005
[30] Shurrab, J., Hussain, M., & Khan, M. (2019). Green practices in construction. Engineering, Construction and Architectural Management, 26(6), 1063–1086. https://doi.org/10.1108/ECAM-02-2018-0056
[31] Silva, E. N., Mello, L. C. B., & Pinto, G. O. (2022). Challenges for lean construction adoption. Construction Innovation. https://doi.org/10.1108/CI-08-2021-0148
[32] Subramanya, K., Kermanshachi, S., & Rouhanizadeh, B. (2020). Modular vs traditional construction. https://doi.org/10.3311/ccc2020-012
[33] Waskita, D. S., & Hariadi, A. D. P. (2022). Project performance improvement. https://doi.org/10.5281/zenodo.7008302
[34] Willar, D., Waney, E. V., Pangemanan, D. D., & Mait, R. (2020). Sustainable practices in infrastructure. Smart and Sustainable Built Environment, 10(1), 106–124. https://doi.org/10.1108/sasbe-07-2019-0086
[35] Wong, S. S., & Soo, A. L. (2019). Safety performance in the construction industry. Journal of Social Science and Humanities, 16(3), 1–9.