Wresniwira, S., Adha, N., Hazel, F., Hernadi., A. D., Naufal, A. L., Widyastuti, A. R., Sentosa, G.A., Saputra, R. A., Mardiansyah, B., & Fajarwanto, A. (2025). Lean's Respect for People: A Key Driver of Project Performance on Large-Scale Construction in Indonesia. In O. Seppänen, L. Koskela, & K. Murata (Eds.), *Proceedings of the 33rd Annual Conference of the International Group for Lean Construction* (IGLC33) (pp. 59–69). https://doi.org/10.24928/2025/0243

LEAN PHILOSOPHY'S RESPECT FOR PEOPLE: A KEY DRIVER OF HIGH-PERFORMANCE PROJECTS ON LARGE-SCALE CONSTRUCTION IN INDONESIA

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ABSTRACT

The construction industry significantly contributes to Indonesia's economic development through infrastructure growth, urbanization, and job creation. Despite its importance, many projects continue to face challenges such as cost overruns, schedule delays, and inefficiencies.

Lean Construction emerges as a promising approach to address these issues by focusing on waste elimination and value maximization. Central to Lean Construction is the principle of Respect for People (RFP), which promotes a collaborative culture, empowers individuals, and ensures psychological safety in the workplace. When people feel respected and engaged, they are more likely to contribute ideas, solve problems, and drive innovation.

This study investigates the influence of RFP on project performance by integrating data from literature reviews, questionnaire surveys, interviews, and observations of Digital Construction (DC) implementation. The findings reveal a significant performance gap between High-Performance Projects (HPP) and Low-Performance Projects (LPP), where LPP scores range from 2.653 to 2.710 and HPP scores range from 3.256 to 3.406. This 0.546 gap underscores the measurable impact of RFP practices on project outcomes.

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The study concludes that placing people at the center of construction practices supported by digital tools can significantly improve efficiency, collaboration, and long-term success in Indonesia's construction sector.

KEYWORDS

Lean construction, Respect for People, Digital Construction, Continuous Improvement.

INTRODUCTION

The construction industry plays a fundamental role in driving economic growth, particularly in developing countries such as Indonesia. These projects not only facilitate the construction of essential infrastructure, such as roads and dams, but also generate employment opportunities and stimulate various economic sectors. However, challenges such as cost overruns, schedule delays, and inefficiencies in resource management remain prevalent, particularly in Indonesia, where the complexity of large-scale projects often leads to performance bottlenecks.

This study focuses on six infrastructure construction projects undertaken by PT Hutama Karya in the road and dam sectors, with contract values ranging from approximately USD 10 million to USD 58 million. These projects serve as a case study to examine how key management principles, particularly those derived from Lean Construction, can enhance efficiency and project outcomes.

One of the fundamental principles of Lean Construction is Respect for People (RFP), which emphasizes workforce engagement, psychological safety, and continuous learning (Ballard & Howell, 2003). Rooted in the Toyota Production System, RFP fosters collaboration, reduces inefficiencies, and improves project performance (Koskela, 1992). Research has shown that effective implementation of RFP is linked to increased productivity and reduced project risks (Sacks et al., 2010). However, translating RFP principles into measurable actions remains a challenge in the construction industry (Tezel et al., 2021).

By addressing these challenges, this study aims to provide practical insights into the integration of RFP within Lean Construction projects, ultimately enhancing workforce engagement and overall project efficiency.

LEAN PRACTICES

LEAN CONSTRUCTION PHILOSOPHIES

The Lean philosophy in construction is fundamentally anchored in three core principles: reducing waste, continuous improvement, and respect for people. Waste refers to any activity that does not provide value to the final product, including excess materials, unnecessary movement, and delays. The identification and elimination of such waste are crucial for enhancing efficiency and sustainability in construction projects (Sifa & Mbatta, 2023; Maraqa et al., 2022). For instance, the implementation of offsite prefabrication has been shown to improve waste control and reduce damage, thereby aligning with Lean principles aimed at minimizing non-value-adding activities (Salgın et al., 2016).

Reducing waste is a primary focus of Lean Construction, which aims to eliminate non-value-adding activities throughout the construction process. While material waste is considered, Lean Construction primarily focuses on minimizing process-related waste, such as time, space, and effort, to enhance overall efficiency and productivity. Reducing waste is articulated in various studies, which emphasize that Lean Construction focus to minimize waste in materials, time, and effort, thereby maximizing value for customers (Fahmy, 2020; Bajjou et al., 2019; Demirkesen, 2021). Continuous improvement, or "Kaizen," is a principle encourages ongoing efforts to enhance processes, products, and services. It is supported by collaborative project management tools that facilitate systematic and rigorous approaches to improvement (Bajjou et

al., 2019; Mandujano et al., 2016). Respect for people is the third fundamental principle of Lean Construction. This principle underscores the importance of valuing all stakeholders involved in the construction process, including workers, clients, and suppliers. It advocates for a culture of collaboration and mutual respect, which is crucial for fostering teamwork and enhancing overall project performance (Korb & Ballard, 2018; Arroyo et al., 2021).

CONTINUOUS IMPROVEMENT ON CONSTRUCTION

Continuous Improvement (CI) in Lean Construction is an ongoing effort to enhance processes and eliminate inefficiencies (Tommelein & Ballard, 2017). The PDCA (Plan-Do-Check-Act) cycle is widely used for iterative improvements in construction workflows (Demirkesen, 2021). CI requires clear goals, performance metrics, and leadership commitment to be effective (Mossman, 2009). A foundational aspect of CI is the establishment of specific areas for improvement, which requires organizations to gather relevant data to identify inefficiencies or bottlenecks. The PDCA (Plan-Do-Check-Act) cycle is a widely recognized tool within CI frameworks, providing a systematic method for testing improvements and measuring their effectiveness (Dinis-Carvalho, 2021). Continuous Improvement (CI) in Lean Construction is an iterative process aimed at enhancing efficiency, reducing waste, and fostering a culture of ongoing learning. In this study, Digital Construction is examined as a key enabler of CI, providing advanced tools that facilitate data-driven decision-making and improve project execution.

Digital Construction serves as a key enabler of Lean by enhancing efficiency and reducing waste (Aziz & Hafez, 2013). The integration of Building Information Modeling (BIM) with Lean principles has been shown to improve collaboration and streamline workflows (Sacks et al., 2010). Automation, such as digital scheduling tools, contributes to reducing rework and increasing predictability in construction projects (Tezel et al., 2021). However, CI extends beyond technology and requires strong leadership, collaborative teamwork, and a commitment to Lean principles to drive meaningful and sustainable improvements. Digital Construction is not a primary requirement for a project, although the example in this study consisted of 6 (six) considerably DC performed projects.

WHAT DOES RFP MEAN AND WHY IS IT IMPORTANT?

Respect for People (RFP) is a core principle of the Toyota Production System (TPS) and Lean thinking, complementing Continuous Improvement (CI). While CI focuses on efficiency and performance, RFP provides the cultural foundation for sustainable success. Toyota's philosophy, captured in the motto "We make people before we make cars," emphasizes empowering individuals to identify inefficiencies, propose solutions, and contribute to improvement.

RFP fosters an organizational culture where improvement is a shared responsibility, recognizing the creativity and problem-solving potential of every individual. In Lean Construction, adopting RFP is challenging due to the industry's project-based nature and transient subcontractor relationships. Ultimately, RFP is more than a principle, it is a strategic enabler that balances immediate improvements with long-term excellence.

RESEARCH METHOD

Based on Figure 2 related to the Research Method Flowchart, this research employs a mixed-method approach, integrating literature review, semi-structured interviews, and structured questionnaires to evaluate the relationship between Respect for People (RFP) and project performance in Lean Construction. Questionnaires and interviews serve as the primary data collection techniques. The literature review establishes a theoretical foundation and contextual framework, while questionnaires are designed to capture quantitative data from a broader

participant base. Complementing these, interviews provide additional qualitative insights, allowing for a deeper exploration of the project (Figure 2).

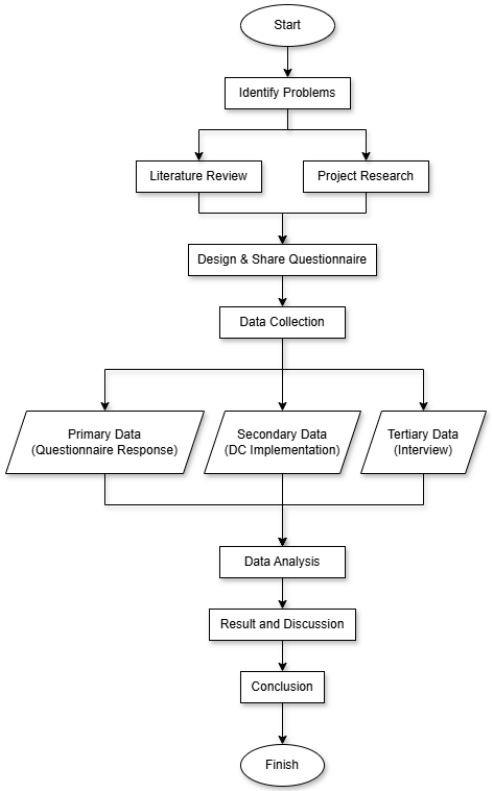

Figure 1: Research Method Flowchart

PROBLEM IDENTIFICATION

One of the core principles of Lean Construction is Respect for People (RFP), which emphasizes the value of human resources in achieving project success. A strong culture of RFP nurtures trust, collaboration, psychological safety, and active worker participation elements that are essential for problem-solving, continuous improvement, and innovation on-site.

At the same time, the construction industry is undergoing a digital transformation through the implementation of Digital Construction (DC), which involves the use of advanced tools such as Building Information Modeling (BIM), Common Data Environment (CDE), and integrated digital workflows to enhance project planning, coordination, and execution.

Despite this strong theoretical linkage, empirical research on how RFP influences the success of Digital Construction implementation, particularly in developing countries like Indonesia, remains limited.

To address this gap, the present study aims to explore the interrelationship between RFP and DC implementation by comparing High-Performance Projects (HPP) and Low-Performance Projects (LPP).It will examine how variations in RFP practices affect the adoption and effectiveness of digital tools, and in turn, how this impacts project efficiency, team collaboration, and overall outcomes. The findings are expected to provide actionable insights for advancing both Lean Construction practices and digital transformation strategies in Indonesia's construction sector.

RESPECT FOR PEOPLE PARAMETERS

The author has conducted a literature review for relevant topics related to RFP. This literature review is used to give further understanding of the RFP assessment parameters for projects that apply Lean Construction principles. Based on research conducted by Erazo-Rondinel et al.

(2024), there are 11 practical steps to conduct and implement RFP in projects. The list of 11 practical steps as follows:

1. Create a work environment that supports Continuous Improvement;
2. Recognize and celebrate every success;
3. Providing constructive feedback to support personal and professional development;
4. Creating clear and collaborative goals;
5. Supports active participation of workers in decision-making processes and work;
6. Ensure safety in the construction environment;
7. Create a comfortable working environment;
8. Ensure the recruitment and retention of competent workers;
9. Create a psychologically safe work environment that accommodates collaboration and learning processes;
10. Rewarding workers with appropriate wages;
11. Cultivating respect for fellow coworkers.

In an effort to realize the practical steps of implementing Respect for People, here are 9 barries that must be overcome to be able to realize Respect for People in Lean Construction-based projects:

1. Lack of active participation from workers;
2. Lack of transparent communication;
3. Culture of blaming others for one's own mistakes;
4. The rise of technocracy in the construction industry;
5. Decisions that are only determined by authorized people;
6. Worker inequality and discrimination;
7. Resistance to change and lack of flexibility in work methods;
8. Lack of attention and opportunities for career development;
9. Destructive skills.

By successfully passing these parameters, which refer to the practical steps, a project can be said to have started implementing RFP well and if it has carried out the steps in the 11 steps of implementing RFP, then the project can be called a project that has fully implemented RFP.

PROJECT PERFORMANCE INDEX

Construction projects performance can be measured using Performance Index (PI). Generally, there are SPI (Schedule Performance Index) and CPI (Cost Performance Index). An SPI value greater than 1 indicates that the project is ahead of schedule, while a value less than 1 signifies delays in project execution (Hasan et al., 2021; Gomes et al., 2013). In the other hand, a CPI greater than 1 indicates that the project is under budget, while a CPI less than 1 suggests cost overruns (Gomes et al., 2013). Together, SPI and CPI provide a comprehensive overview of a project's performance, enabling effective monitoring and control of both time and cost aspects, which are crucial for the successful completion of construction projects (Damara, 2020).

Projects studied in this research utilize an alternative Performance Index, namely the Efficiency Performance Index (EPI), which was specifically developed for this study. The primary objective of EPI is to define the expected return for contractors. An EPI value greater than 1 indicates that the project is efficient, whereas an EPI value less than 1 suggests project inefficiency. By integrating this performance index with existing metrics, contractors can leverage more justifiable data-driven insights to support decision-making in project execution. Table 1 provides the detailed Index Performance Formula used in this study.

Table 1: Index Performance Formula

Index Performance	Formula	Information
CPI	EV/AC	EV: Earned Value AC: Actual Cost
SPI	BAC/AC	BAC: Budget At Completion AC: Actual Cost
EPI	EV/PV	EV: Earned Value PV: Planned Value

RESEARCH INSTRUMENT

This research uses 3 types of research instrument consisted of Questionnaire, DC Implementation & User Feedback, and Interview with Relevant Stakeholder. The questionnaire is divided for the project manager, site manager, and a questionnaire for the party one level below. Questionnaire is designed to provide questions and narration about Respect for People Implementation on construction projects. Secondary data is provided by Digital Construction Division and Tertiary Data is gained from interviews.

DATA COLLECTION METHOD

This research was conducted during the period of December to January. To obtain data for this project, a questionnaire will be prepared and distributed to the workers such as Project Manager (PM), Site Manager (SM) and Officers. To obtain data for this project, a questionnaire will be prepared and distributed to the workers in the projects. Primary data is obtained through questionnaire responses, capturing participants' perceptions and experiences. Secondary data focuses on Digital Construction Implementation (DC) practices, including reports (SPI, CPI, and EPI) and case studies that highlight the integration of digital technologies in construction projects. Tertiary data is gathered through interviews with key stakeholders, such as project managers and operational division, providing expert insights and in-depth perspectives.

DATA ANALYSIS METHOD

Each response is assigned a corresponding value to quantify the extent of RFP Implementation within the examined projects. To calculate the RFP index, questionnaire data consisting of four levels of assessment is analyzed by summing the scores from all four levels for each respondent. The total scores of each respondent are then grouped based on the stakeholders involved. Subsequently, the average score is calculated for each stakeholder within each project, resulting in an average value that reflects the RFP index of each project.

The questions for this research were formulated based on the principles of Lean Philosophy, specifically addressing the 11 practical steps and the 9 common barriers frequently encountered in projects. Additionally, they were developed by analyzing common complaints and challenges observed in the field.

FINDING AND DISCUSSION

OVERVIEW OF RESPONDENTS AND PROJECT PERFORMANCE CATEGORIES

The study analyzed six large-scale construction projects (Dam and Road Projects) in Indonesia, categorized into High-Performed Projects and Low-Performed Projects based on their performance. The categorization was determined by low scores in the Schedule Performance Index (SPI), Cost Performance Index (CPI), and Efficiency Performance Index (EPI). Respondents were selected from six projects to provide insights into Respect for People (RFP)

implementation. The distribution of respondents included Project Managers, Site Engineers, and Team Members. Table 2 presents the Project Performance Index used for classification.

The numbers in the table, particularly those related to " Project Performance" and " Digital Construction Performance," are derived from Project Performance, which is calculated based on SPI, EPI, and CPI. If these values are less than 1, the project is considered underperforming. Meanwhile, Digital Construction Performance is measured using parameters related to the maturity level of Digital Construction implementation in a project.

Table 2: Project Performance Index

Project	Contract Value (USD)	SPI	EPI	CPI	Project Performance	Digital Construction Performance
A	58.000.000	> 1	> 1	> 1	Excellent	93.94%
B	47.500.000	> 1	> 1	> 1	Excellent	93.25%
C	8.600.000	> 1	> 1	> 1	Excellent	93.25%
D	38.900.000	< 1	< 1	> 1	Warning	93.13%
E	39.200.000	< 1	< 1	> 1	Warning	85.31%
F	19.000.000	> 1	< 1	> 1	Warning	88.06%

PROJECT STAKEHOLDER RESPONSES

The responses from each stakeholder are presented in the tables below, illustrating their individual perspectives on the implementation of RFP principles within the projects. These responses highlight variations in how each role perceives and practices RFP.

The questionnaire employed a rating scale ranging from 1 to 4 to measure the level of respect for people within the context of Lean Philosophy. A score of 1 reflects a minimal or insufficient demonstration of respect for people, while a score of 4 represents an exemplary level of respect, indicating alignment with the core principles of Lean Philosophy.

Using a rating scale of 1 to 4, projects that achieve a score of 3 or higher are classified as High-Performance Projects (HPP), indicating that they meet the criteria for effective implementation of Lean principles. Meanwhile, projects with a score below 3 are categorized as Low-Performance Projects (LPP), reflecting areas where improvements are needed to align with high-performance standards and goals. Table 3, Table 4, and Table 5 present the responses from Project Managers, Site Managers, and Officers, with an average of 5 individuals section respectively, providing insights into their assessment of project performance and Lean Construction implementation.

Table 3: Project Manager Responses

No	Question	Project					
		A	B	C	D	E	F
1	Input from the Owner on design is properly addressed.	4	4	4	4	3	1
2	Sudden changes in specifications are managed accordingly.	4	4	4	1	2	2
3	Requests to adjust completion time are carefully handled.	4	4	2	4	2	1
4	Delays from subcontractors are followed up with action.	4	4	4	1	2	4
5	Communication with subcontractors is maintained effectively.	3	4	4	3	3	4
6	Operational Division needs are considered in decisions.	4	1	3	2	3	4
7	Resource requests from Operations are evaluated and responded to.	1	1	1	3	1	1

Table 4: Site Manager Responses

No	Question	Project					
		A	B	C	D	E	F
1	Scope changes from Owner are addressed.	2	2	4	4	2	4
2	Delay complaints are clarified and resolved.	4	4	4	2	4	4
3	Quality feedback is followed up.	4	4	4	1	4	4
4	Communication issues are improved.	4	4	4	1	4	4
5	Extra work requests are reviewed.	4	4	4	4	4	2
6	Subcontractor feedback is considered.	3	1	3	2	3	1
7	Policy feedback is reviewed.	4	1	4	4	1	3
8	Team conflicts are mediated.	4	4	4	4	1	4
9	Method change requests are evaluated.	4	4	4	4	4	2
10	Target issues are supported.	4	4	4	4	4	4
11	Task issues are guided.	4	4	4	2	4	3
12	Team conflicts are managed.	4	4	4	2	2	2
13	Mistakes are corrected constructively.	4	4	1	2	3	1
14	Efficiency ideas from officers are considered.	4	4	2	3	4	4
15	Suggestions from officers are welcomed.	4	4	4	4	4	4
16	Operations are involved through planning coordination.	4	4	4	1	1	1
17	Operational needs are ensured during execution.	1	4	4	3	1	2
18	Disagreements are resolved through alignment.	1	4	3	4	1	3
19	Operational input is encouraged continuously.	4	4	1	2	4	2
20	Operational delays are managed and adjusted.	4	4	3	1	4	4

Table 5: Officer Responses

No	Question	Project					
		A	B	C	D	E	F
1	AI and tech use is assessed for impact on roles and dynamics.	4	4	4	4	4	1
2	Collaboration with Operations is built via open communication.	3	4	4	4	4	3
3	Operational support is aligned with project continuity.	3	2	2	2	2	4
4	Incorrect methods by subcontractors are corrected promptly.	3	3	3	3	2	3
5	Unauthorized changes are reviewed and resolved immediately.	2	4	3	3	3	2
6	Sudden inspections are met with transparency and updates.	4	3	3	3	4	3
7	Unnotified spec changes are discussed to protect interests.	4	4	4	2	1	1
8	Uninformed work changes are clarified with the team.	2	2	2	2	3	1
9	Top-down decisions are addressed via feedback channels.	1	4	1	2	2	2
10	Feedback is delivered clearly, respectfully, and constructively.	3	4	3	4	1	3
11	Blame is reduced by fostering accountability and support.	3	3	3	3	3	3
12	Coordination relies on consistent communication among all parties.	4	4	4	2	2	2
13	Trust gaps and hierarchy issues may block RFP efforts.	3	4	4	3	4	2

No	Question	Project					
		A	B	C	D	E	F
14	Team success is celebrated through recognition and reflection.	4	4	4	1	3	3
15	Limited work time is managed by discussing timelines.	2	4	2	3	3	4
16	Comfort at work is ensured through fair policies and support.	4	4	4	4	3	4
17	Continuous improvement is driven by sharing and evaluation.	4	3	2	4	4	3
18	Owner–Subcontractor disputes are mediated with focus and neutrality.	4	4	4	4	2	4

The results, analyzed from the responses above, yield scores for each stakeholder across the different projects, as shown in the table below. These scores reflect the varying degrees to which each stakeholder perception the implementation of RFP principles within each project. Table 6 provides a summary of the Questionnaire Responses, offering insights into how different roles assess RFP adoption and its impact on project performance.

Table 6: Questionnaire Response Summary

Projects	Status	Project Manager	Site Manager	Officer
A	HPP	3.429	3.550	3.167
B	HPP	3.143	3.600	3.556
C	HPP	3.143	3.450	3.167
D	LPP	2.571	2.700	2.944
E	LPP	2.286	2.950	2.833
F	LPP	2.429	2.900	2.667

Based on Figure 3, Figure 4, and Figure 5, Project Manager demonstrates the largest gap, with a difference of 0.571 points, indicating a more pronounced contrast in RFP implementation between high and low-performing projects. In contrast, Site Manager have 0.500 points gap and Officer show the smallest gap of 0.222 points, suggesting that PM have a higher responsibility on how RFP is implemented on projects more than Officer and Site Manager.

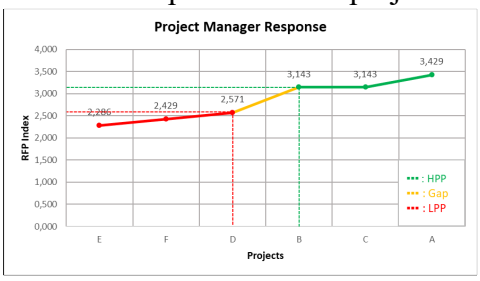

Figure 2: Project Manager Response

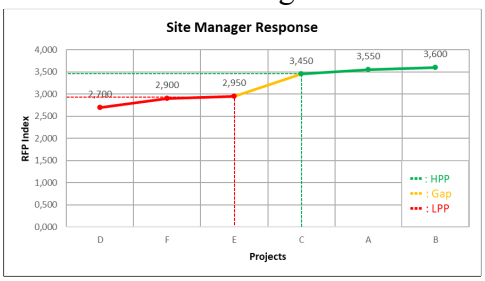

Figure 3: Site Manager Response

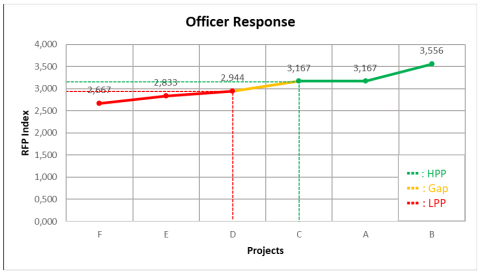

Figure 4: Officer Response

OVERALL INDEX PERFORMANCE OF RFP IMPLEMENTATION

Table 7 presents the RFP Index Performance between High-Performance Projects (HPP) and Low-Performance Projects (LPP), revealing a significant gap of approximately 0.546 points between project scores. This distinction is clearly illustrated in both the table and the line graph, emphasizing the contrast in RFP implementation between HPP and LPP. The overall score index is weighted as follows: Project Manager (PM) at 40%, Senior Manager (SM) at 35%, and Officer at 25%..

Table 7: RFP Index Performance

	HPP			LPP		
Project	**A**	**B**	**C**	**D**	**E**	**F**
Scores	3.406	3.406	3.256	2.710	2.655	2.653

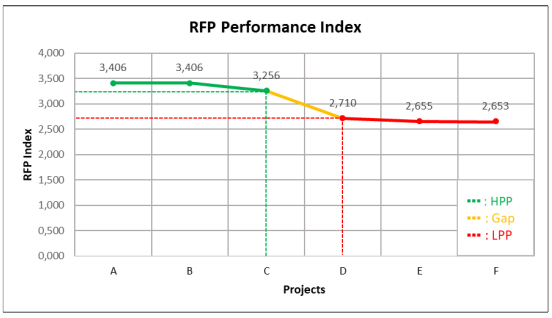

Figure 5: RFP Index Performance

DISCUSSION AND CONCLUSION

There is a clear distinction between High-Performance Projects (HPP) and Low-Performance Projects (LPP). LPP scores range between 2.653 and 2.710, while HPP scores demonstrate significantly better performance, ranging from 3.256 to 3.406, resulting in a notable gap of 0.546. Effective project management practices, including strong communication, decision-making, and adherence to protocols, are essential for bridging this gap. This fulfills several practical steps in Lean, such as providing constructive feedback to support personal and professional development and encouraging active participation of workers in decision-making processes and daily tasks.

The principle of Respect for People (RFP) is demonstrated by the Site Manager (SM) fostering good relationships with officers, such as proactively addressing their challenges and providing guidance. This includes practical steps in Lean, such as creating clear and collaborative goals and establishing a comfortable working environment. Strengthening the understanding and application of RFP principles is essential to improving collaboration, productivity, and overall success in the construction sector and the most important to implement Cultivating respect for fellow coworkers.

ACKNOWLEDGMENTS

The author would like to express sincere gratitude to the project teams involved in the infrastructure works under PT Hutama Karya, particularly those from the dam and road sectors, for their valuable participation in this research. Special thanks are extended to the individuals who kindly agreed to be interviewed and to those who completed the questionnaire, providing honest insights and experiences that greatly enriched the study.

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