GIJES
Greenation International Journal of Engineering Science
+62 81210467572 https://research.e-greenation.org/GIJES greenation.info@gmail.com
GREENATION RESEARCH

DOI: https://doi.org/10.38035/gijes.v4i2

Identification of Human Resource Planning Factors in In-house Construction Management (Owner-Managed Construction) Affecting the Time Performance of Hotel Development Projects

Rahma Ghaesani Subagja[1], Rully Andhika Karim[2]
[1]Magister of Civil Engineering Construction Management Program, Faculty of Engineering, Universitas Indonesia, Indonesia, rahma.ghaesani@ui.ac.id
[2]Magister of Civil Engineering Construction Management Program, Faculty of Engineering, Universitas Indonesia, Indonesia, rully.a.karim@gmail.com

Corresponding Author: rahma.ghaesani@ui.ac.id[1]

Abstract: In projects implementing an In-house Construction Management (CM) system, the effectiveness of human resource (HR) planning is a critical aspect in supporting the achievement of project time targets, particularly in projects whose Owners lack a construction-related background. This condition is commonly found in Hotel Development Projects, as the Owner's core business is neither in the construction sector nor in hotel operations. Therefore, this study aims to analyze the HR planning factors of In-house CM in owner-managed construction with limited project management background, and to examine their influence on project time performance. The study employs a descriptive quantitative approach using a case study method. Data were obtained through a literature review, expert validation to determine the level of influence of indicators on time performance, and the distribution of questionnaires to project respondents to identify the existing conditions. Data analysis was conducted using the Relative Importance Index (RII) method, mean score, and the Spearman correlation test. The RII results identified 12 indicators categorized as "Very High" in importance, which were subsequently tested for their correlation with project time performance. The results indicate that HR mobilization time planning and the establishment of team coordination relationships have the strongest correlation (categorized as "Strong"), thus becoming the priority indicators in efforts to improve the time performance of Hotel Development Projects.

Keywords: In-house Construction Management, Owner-Managed Construction, Human Resource Planning, Project Time Performance, Hotel Construction Project

INTRODUCTION

Project delays remain a frequently occurring problem across various construction projects in Indonesia. This phenomenon not only leads to increased project costs but can also reduce productivity, disrupt user operations, and affect project owner satisfaction. Various studies have shown that project delays are influenced by numerous factors, including

inadequate planning, weak coordination among stakeholders, ineffective project control, suboptimal communication, and insufficient human resource management (Rahmat, 2021; Surri & Alfianto, 2025). In addition, the availability of competent labor and appropriate HR management have also been proven to have a significant influence on the time performance of construction projects (Bahr & Laszig, 2021; Yunita et al., 2026).

In Hotel Development Projects of the owner-managed construction type, project management is carried out using an In-house Construction Management system, namely a system that enables the project owner to perform construction management functions internally without engaging external construction management consultants. Within this system, the Owner plays an active role in the planning, coordination, control, and decision-making processes of the project. However, in this case study, the Owner's background and experience do not originate from the field of construction management but rather from the development and ownership of a Steam Power Plant (PLTU). Furthermore, this Hotel Development Project is the first building construction project directly managed by the Owner, and it is therefore expected to serve as a reference for similar projects in the future. These conditions present distinct challenges in the implementation of construction management functions, making the effectiveness of human resource planning and the competence of personnel in carrying out construction management functions important factors that may influence the achievement of project time performance (Bahr & Laszig, 2021).

Nevertheless, the HR planning factors in in-house construction management that exert a dominant influence on the time performance of this Hotel Development Project, as well as the actual conditions of their implementation in the field, remain unknown. Therefore, this study was conducted to identify the HR planning factors that influence project time performance, and to formulate recommendations within the In-house Construction Management system in order to improve project time performance.

METHOD

The research strategy employed in this study is the survey method using a quantitative approach. The research instrument used is a questionnaire with nominal and ordinal measurement scales. The analytical methods used include content validation through expert judgment and Relative Importance Index (RII) analysis to determine the level of importance of HR Planning factors influencing time performance in the Hotel Building Development Project. Statistical analysis was conducted using SPSS software for validity testing, reliability testing, and correlation testing between variables. The Human Resource Planning variable (X1) and the Time Performance variable (Y) were derived based on the results of the literature review, as presented in Table 1 and Table 2.

Table 1. Indicators of Human Resource Planning

Sub Variables	Indicator	Indicator explanation	Source
Human Resource Needs Planning	Identification of project HR requirements (X1.1.1)	Determining the number and types of workers according to project needs	PMI (2021)
	Determination of HR competence (X1.1.2)	Determining the required HR qualifications and expertise	PMI (2021); Cheng et al. (2005)
	Alignment of HR with project complexity (X1.1.3)	Adjusting HR needs to the scale and complexity of the project	PMI (2021)
Project Team Organization Planning	Development of the project organizational structure (X1.2.1)	Establishing the organizational structure and the distribution of its functions	PMI (2021)

	Clarity of roles and responsibilities (X1.2.2)	Defining the duties and responsibilities of each team member	PMI (2021)
	Establishment of team coordination relationships (X1.2.3)	Defining the coordination flow among team members	PMI (2021); Ochieng & Price (2010)
Human Resources Procurement Planning	Workforce recruitment strategy (X1.3.1)	Planning the recruitment strategy for project HR	PMI (2021)
	Selection of competent HR (X1.3.2)	Selecting competent HR who meet the required qualifications	PMBOK PMI (2021); Dainty et al. (2007)
	HR mobilization time planning (X1.3.3)	Planning when HR are to be deployed on the project	PMI (2021)
Human Resource Development Planning	HR training planning (X1.4.1)	Planning training programs to enhance HR competence	PMBOK (PMI)
	Development of technical and managerial skills (X1.4.2)	Improving HR capabilities in technical and managerial aspects of the work	PMI (2021); Love et al. (2005)
	Evaluation of HR development needs (X1.4.3)	Evaluating HR performance	PMI (2021)
Team Management Planning	Team communication planning (X1.5.1)	Planning communication patterns within the project team	PMI (2021)
	Team performance management planning (X1.5.2)	Planning the HR performance evaluation/appraisal system	PMI (2021)
	Team motivation and productivity planning (X1.5.3)	Planning strategies/efforts to maintain work morale, improve work effectiveness, and enhance HR work productivity	PMI (2021); Thomas & Sudhakumar (2013)

Source: Processed by the authors

Table 2. Indicators of Human Resource Planning

Indicator	Indicator explanation	Source
Milestone Completion Accuracy	The degree of milestone completion in accordance with the plan	CIOB (2020; PMI (2021)

Source: Processed by the authors

Research Stages

The research stages undertaken are as follows: 1) Initial Expert Validation; 2) RII Analysis from Expert Assessment Results; 3) Distribution of Questionnaires to Respondents; 4) Statistical Analysis of Respondent Questionnaire Results; 5) Descriptive Analysis of Existing Conditions; 6) Final Expert Validation.

Rating Scale

The rating scale used in the construct validity test and content validity test for the HR Planning variable (X1) and Time Performance variable (Y) at the expert validation stage was "Yes" or "No". Subsequently, the Likert scale used at the expert validation stage to assess the impact of HR Planning (X1) on Time Performance (Y) was as follows: 1 = No Influence; 2 = Minor Influence; 3 = Moderate Influence; 4 = Major Influence; 5 = Very Major Influence. The Likert scale used for respondents' assessment of the existing conditions of project HR planning

was: 1 = Very Poor; 2 = Poor; 3 = Fairly Good; 4 = Good; 5 = Very Good. Meanwhile, the Likert scale used by respondents to assess project Time Performance was: 1 = Poor (Delayed >-16%); 2 = Slightly Delayed (Delayed between -8% and -16%); 3 = Average (Delayed <-8%); 4 = Fairly Good (Ahead between 0%–4%); 5 = Good (Ahead >4%).

Instrument validity

Before being distributed to respondents, the questionnaire first underwent a Construct Validity Test and a Content Validity Test. The Construct Validity Test was conducted by soliciting the opinions of five experts (expert judgment) from two different companies, each with more than 15 years of work experience.

The results of the Construct Validity Test and Content Validity Test at the Initial Expert Validation stage were subsequently used as the basis for the RII calculation as well as for the questionnaire instrument to be administered to respondents.

Categories for Assessing Existing Conditions

The following are the categories for assessing existing conditions:

1) 1.00 – 1.80 = Very Poor; very unfavorable condition, requires total improvement
2) 1.81 – 2.60 = Poor/Low; unfavorable condition, requires substantial improvement
3) 2.61 – 3.40 = Fair/Moderate; fair condition, requires several improvements
4) 3.41 – 4.20 = Good/High; favorable condition, requires minor refinement
5) 4.21 – 5.00 = Very Good/Very High; very favorable condition, should be maintained

RII Assessment Categories

The results of the existing condition analysis were subsequently compared with the RII results from the experts' assessments. The following are the RII assessment categories:

1) $0.8 < RII < 1.0$ = High
2) $0.6 < RII < 0.8$ = High-Medium
3) $0.4 < RII < 0.6$ = Medium
4) $0.2 < RII < 0.4$ = Medium-Low
5) $0.0 < RII < 0.2$ = Low

The RII analysis results yield the factors considered dominant, namely those with RII values of 0.80–1.00. The factors filtered at this stage were subsequently used as instruments in the questionnaire survey stage administered to respondents.

Validity Test, Reliability Test, and Correlation Test

The Instrument Content Validity Test was conducted using the Pearson Product-Moment Correlation Test with the assistance of SPSS software, by comparing the calculated r-value (r-count) with the r-table value. If r-count > r-table, the instrument is considered reliable. Subsequently, a Spearman's Rho Correlation Test was conducted to assess the factor with the highest level of correlation. The Spearman's Rho assessment categories are as follows:

1) 0.00 – 0.19 = Very Weak
2) 0.20 – 0.39 = Weak
3) 0.40 – 0.59 = Moderate
4) 0.60 – 0.79 = Strong
5) 0.80 – 1.00 = Very Strong

The results of the existing project condition analysis, the RII calculation, and the correlation test between variables X and Y will subsequently form the basis for formulating improvement recommendations for HR planning in In-house Construction Management (Owner-managed Construction).

RESULTS AND DISCUSSION

Respondent Characteristics

The respondents in this study comprised the entire population of workers employed at the Owner's Company who were involved in the Hotel Development Project as the In-house Construction Management (CM) team/Owner Representative for the project. Respondents were required to have an understanding of project management practices, with the following criteria: (1) a minimum involvement period of 1 year in the Hotel Development Project; (2) a minimum educational background of a four-year Diploma (D4)/Bachelor's degree (S1); and (3) fluency in Indonesian. The total number of workers on the project was 37 people. However, based on the respondent criteria established in this study, only 18 people met the requirements as respondents. This was due to the characteristics of the workforce in the In-house CM project, which largely consisted of foreign workers, resulting in communication constraints arising from limited proficiency in either Indonesian or English.

Expert Validation Results

At this stage, expert validation was conducted on the variables derived from the literature review, namely HR Planning and Time Performance. The expert validation results are presented in Table 3.

Table 3. Validity Test Results

Code	P1	P2	P3	P4	P5	Decision
X1.1.1	V	V	V	V	X	V
X1.1.2	V	V	V	V	V	V
X1.1.3	V	V	V	V	V	V
X1.2.1	V	V	V	V	V	V
X1.2.2	V	V	V	V	V	V
X1.2.3	V	V	V	V	V	V
X1.3.1	V	V	V	X	V	V
X1.3.2	V	V	V	V	V	V
X1.3.3	V	V	V	V	V	V
X1.4.1	V	V	V	X	V	V
X1.4.2	V	V	V	V	V	V
X1.4.3	V	V	V	V	V	V
X1.5.1	V	V	V	V	V	V
X1.5.2	V	V	V	V	V	V
X1.5.3	V	V	V	V	V	V
Y	V	V	V	V	V	V

Source: Processed by the authors

Based on the expert validation results, it can be concluded that all indicators were declared valid and could proceed to the next stage.

Existing Conditions

At this stage, the questionnaire instrument was distributed to 18 respondents at the Owner's Company on the Hotel Development Project who worked as the In-house CM team, using a Likert rating scale. This instrument was used to assess the conditions of HR planning (X1) and time performance (Y) on the project. Subsequently, the assessment results for the HR planning variable (X1) were sorted based on the mean value, from the smallest to the largest. The mean assessment results from the 18 respondents are presented in Table 4.

Table 4. Existing Conditions

Code	Likert Scale					Mean	Rank	Category
	1	2	3	4	5			
X1.1.1	1	3	8	4	2	3.17	12	Fair
X1.1.2	0	5	8	3	2	3.11	11	Fair
X1.1.3	1	4	7	5	1	3.06	8	Fair
X1.2.1	2	2	8	3	3	3.17	12	Fair
X1.2.2	1	7	4	4	2	2.94	5	Fair
X1.2.3	0	7	4	6	1	3.06	8	Fair
X1.3.1	0	7	7	2	2	2.94	5	Fair
X1.3.2	1	2	8	5	2	3.28	15	Fair
X1.3.3	1	6	6	4	1	2.89	4	Fair
X1.4.1	5	2	7	3	1	2.61	1	Fair
X1.4.2	3	1	9	3	2	3.00	7	Fair
X1.4.3	1	6	7	3	1	2.83	3	Fair
X1.5.1	0	3	9	5	1	3.22	14	Fair
X1.5.2	2	3	6	6	1	3.06	8	Fair
X1.5.3	3	4	6	4	1	2.78	2	Fair
Y	2	4	9	2	1	2.78		Average

Source: Processed by the authors

Relative Importance Index (RII) Results

The Relative Importance Index (RII) calculation results from the experts' assessments are presented in Table 5.

Table 5. RII Calculation

Code	Likert Scale					RII	Rank	Category
	1	2	3	4	5			
X1.1.1	1	0	1	1	2	0,72	6	High-Medium
X1.1.2	0	0	0	1	4	0,96	2	High
X1.1.3	0	0	0	2	3	0,92	3	High
X1.2.1	0	1	0	1	3	0,84	5	High
X1.2.2	0	0	0	0	5	1	1	High
X1.2.3	0	0	0	3	2	0,88	4	High
X1.3.1	1	0	0	3	1	0,72	6	High-Medium
X1.3.2	0	0	0	1	4	0,96	2	High
X1.3.3	0	0	1	2	2	0,84	5	High
X1.4.1	1	0	0	3	1	0,72	6	High-Medium
X1.4.2	0	0	0	1	4	0,96	2	High
X1.4.3	0	0	0	4	1	0,84	5	High
X1.5.1	0	0	0	4	1	0,84	5	High
X1.5.2	0	0	0	4	1	0,84	5	High
X1.5.3	0	0	0	4	2	0,88	4	High

Source: Processed by the authors

Based on the RII calculation results, three indicators fall into the "High-Medium" category, while the remaining indicators fall into the "High" category. The indicators in the "High" category proceeded to the next stage, namely the respondent survey, whereas the indicators in the "High-Medium" category (X1.1.1, X1.3.1, and X1.4.1) were eliminated at this stage.

Validity and Reliability Test Results

The results of the instrument content validity test on the indicators using SPSS software are presented in Table 6.

Table 6. Validity Test Results

Correlations		
		Y
X1.1.2	Pearson Correlation	,636**
	Sig. (2-tailed)	0,005
	N	18
X1.1.3	Pearson Correlation	,483*
	Sig. (2-tailed)	0,042
	N	18
X1.2.1	Pearson Correlation	,667**
	Sig. (2-tailed)	0,002
	N	18
X1.2.2	Pearson Correlation	,645**
	Sig. (2-tailed)	0,004
	N	18
X1.2.3	Pearson Correlation	,600**
	Sig. (2-tailed)	0,008
	N	18
X1.3.2	Pearson Correlation	0,410
	Sig. (2-tailed)	0,091
	N	18
X1.3.3	Pearson Correlation	,720**
	Sig. (2-tailed)	0,001
	N	18
X1.4.2	Pearson Correlation	,642**
	Sig. (2-tailed)	0,004
	N	18
X1.4.3	Pearson Correlation	,615**
	Sig. (2-tailed)	0,007
	N	18
X1.5.1	Pearson Correlation	,572*
	Sig. (2-tailed)	0,013
	N	18

X1.5.2	Pearson Correlation	,593**
	Sig. (2-tailed)	0,010
	N	18
X1.5.3	Pearson Correlation	0,458
	Sig. (2-tailed)	0,056
	N	18
Y2	Pearson Correlation	1
	Sig. (2-tailed)	
	N	18
****. Correlation is significant at the 0.01 level (2-tailed).**		
***. Correlation is significant at the 0.05 level (2-tailed).**		

Source: Processed using SPSS

Based on the Pearson Product-Moment Correlation Test results, two indicators were found to be invalid (marked in yellow) as they did not meet the validity requirements, namely a Sig. value < 0.05 and r-count > r-table. The r-table value for 18 respondents is 0.468. Therefore, indicators X1.3.2 and X1.5.3 were declared invalid and eliminated at this stage.

Subsequently, a reliability test was conducted on the 10 valid indicators. The reliability test results using SPSS software are presented in Table 7.

Table 7. Reliability Test Results

Reliability Statistics	
Cronbach's Alpha	N of Items
0,969	11

Source: Processed using SPSS

The requirement for the reliability test is a Cronbach's Alpha value > 0.70. Based on these reliability test results, it can be stated that all variables and indicators are reliable.

Correlation Test Results

The Spearman correlation test was used to determine the presence or absence of a relationship (correlation), as well as the direction and strength of the relationship, between two variables in the form of ranks or nonparametric data. The correlation test results of this study are presented in Table 8.

Table 8. Correlation Test Results

Correlations			
			Y
Spearman's rho	X1.1.2	Correlation Coefficient	,594**
		Sig. (2-tailed)	0,009
		N	18
	X1.1.3	Correlation Coefficient	,526*
		Sig. (2-tailed)	0,025
		N	18

X1.2.1	Correlation Coefficient	,576*
	Sig. (2-tailed)	0,012
	N	18
X1.2.2	Correlation Coefficient	,565*
	Sig. (2-tailed)	0,014
	N	18
X1.2.3	Correlation Coefficient	,632**
	Sig. (2-tailed)	0,005
	N	18
X1.3.3	Correlation Coefficient	,759**
	Sig. (2-tailed)	0,000
	N	18
X1.4.2	Correlation Coefficient	,556*
	Sig. (2-tailed)	0,017
	N	18
X1.4.3	Correlation Coefficient	,581*
	Sig. (2-tailed)	0,011
	N	18
X1.5.1	Correlation Coefficient	,566*
	Sig. (2-tailed)	0,014
	N	18
X1.5.2	Correlation Coefficient	,529*
	Sig. (2-tailed)	0,024
	N	18

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Source: Processed using SPSS

Based on the table above, the correlation coefficient values between variable X and variable Y can be observed. These correlation coefficient values were subsequently categorized and ranked in the next stage.

Correlation Ranking

After obtaining the correlation coefficient values from the Spearman correlation test results, each indicator was categorized based on these coefficient values and ranked. The indicators to be carried forward as improvement recommendations are those falling into the "Strong" or "Very Strong" categories. The correlation ranking results are presented in Table 9.

Table 9. Correlation Ranking

Rank		Indicator	Correlation Coefficient	Category
3	X1.1.2	Determination of HR competence	0,594	Moderate
9	X1.1.3	Alignment of HR with project complexity	0,526	Moderate
5	X1.2.1	Development of the project organizational structure	0,576	Moderate
7	X1.2.2	Clarity of roles and responsibilities	0,565	Moderate
2	X1.2.3	Establishment of team coordination relationships	0,632	Strong
1	X1.3.3	HR mobilization time planning	0,759	Strong
8	X1.4.2	Development of technical and managerial skills	0,556	Moderate
4	X1.4.3	Evaluation of HR development needs	0,581	Moderate
6	X1.5.1	Team communication planning	0,566	Moderate

Source: Processed by the authors

Based on the categorization and ranking of correlations, two HR Planning indicators were found to have a high correlation with time performance, namely X1.2.3 and X1.3.3.

CONCLUSION

The research results indicate that the human resource planning factor in in-house construction management contributes to the time performance of the Hotel Building Development Project. This finding is consistent with previous studies stating that the successful achievement of project time targets is influenced not only by technical aspects but also by the effectiveness of human resource management, personnel competence, team coordination, and the organization's capability in project planning and control (Doloi et al., 2012; Bahr & Laszig, 2021). From the results of all stages of the research analysis, the following was found:

The Relative Importance Index (RII) calculation results based on the experts' assessments identified 12 indicators with a "Very High" level of importance. This makes these indicators important to receive attention from Owners who wish to formulate HR planning within their In-house Construction Management system. The order of the indicators from the highest to the lowest value within the "Very High" importance category is as follows: (1) X1.2.2 Clarity of roles and responsibilities; (2) X1.1.2 Determination of HR competence, X1.3.2 Selection of competent HR, X1.4.2 Development of technical and managerial skills; (3) X1.1.3 Alignment of HR with project complexity; (4) X1.2.3 Establishment of team coordination relationships, X1.5.3 Planning of team motivation and productivity; (5) X1.2.1 Development of the project organizational structure, X1.4.3 Evaluation of HR development needs, X1.5.1 Team communication planning, X1.5.2 Team performance management planning, X1.3.3 HR mobilization time planning; (6) X1.3.1 Workforce recruitment strategy, and X1.4.1 HR training planning.

The correlation test results from the respondents' assessments on the Hotel Development Project identified two indicators with a high correlation with time performance, falling into the "Strong" relationship category, namely indicator X1.2.3 Establishment of team coordination relationships and X1.3.3 HR mobilization time planning.

The descriptive analysis of the existing conditions on the Hotel Development Project found that the conditions of all HR Planning (X1) indicators were classified as fairly good but requiring several improvements, while the time performance condition on the project was classified as average with a delay of <-8%.

Based on the existing conditions of the Hotel Development Project, the company is advised to make improvements to project HR planning based on the identification of factors with the highest level of importance and correlation with time performance in this study, namely: (1) HR mobilization time planning, which is important to ensure personnel are available as required at each stage of work and to avoid idle time that may cause delays; and (2) the establishment of team coordination relationships, which plays a role in accelerating

communication, decision-making, and the resolution of field problems. Therefore, development strategies focusing on strengthening team coordination and optimizing HR mobilization and performance must become priorities in efforts to improve the timely completion of the Hotel Development Project.

As a development strategy, the company needs to formulate a more adaptive workforce mobilization schedule, integrated with the project work curve and supported by a periodic team performance evaluation system, so that HR needs can be met in a timely and efficient manner. The results of this evaluation may also serve as input for improving time control in subsequent projects with similar management systems.

REFERENCES

Alaghbari, W., Kadir, MRA, Salim, A., & Ernawati. (2007). The significant factors causing delays of building construction projects in Malaysia. Engineering, Construction and Architectural Management, 14(2), 192–206.

Assaf, S.A., & Al-Hejji, S. (2006). Causes of delays in large construction projects. International Journal of Project Management, 24(4), 349–357.

Bahr, M., & Laszig, L. (2021). Productivity Development in the Construction Industry and Human Capital: A Literature Review. Working Paper/Literature Review.

Belout, A., & Gauvreau, C. (2004). Factors influencing project success: The impact of human resource management. International Journal of Project Management, 22(1), 1–11. doi:10.1016/S0263-7863(03)00003-6.

Chan, D. W. M., & Kumaraswamy, M. M. (1997). A comparative study of causes of time overruns in Hong Kong construction projects. International Journal of Project Management, 15(1), 55–63. doi:10.1016/S0263-7863(96)00039-7.

Dainty, A. R. J., Cheng, M. I., & Moore, D. R. (2004). A competency-based performance model for construction project managers. Construction Management and Economics, 22(8), 877–886. doi:10.1080/0144619042000202726.

Doloi, H. (2013). Cost overruns and failure in project management: Understanding the roles of key stakeholders in construction projects. Journal of Construction Engineering and Management, 139(3), 267–279.

Doloi, H., Sawhney, A., Iyer, K.C., & Rentala, S. (2012). Analyzing factors affecting delays in Indian construction projects. International Journal of Project Management, 30(4), 479–489.

Durdyev, S., & Mbachu, J. (2011). On-site labor productivity of New Zealand construction industry: Key constraints and improvement measures. Australasian Journal of Construction Economics and Building, 11(3), 18–33. doi:10.5130/AJCEB.v11i3.2120.

Kazaz, A., Manisali, E., & Ulubeyli, S. (2008). Effect of basic motivational factors on construction workforce productivity in Turkey. Journal of Civil Engineering and Management, 14(2), 95–106. doi:10.3846/1392-3730.2008.14.4.

Kerzner, H. (2022). Project Management: A Systems Approach to Planning, Scheduling, and Controlling (13th ed.). Wiley.

Loosemore, M., Dainty, A., & Lingard, H. (Eds.). (2020). Human Resource Management in Construction Projects: Strategic and Operational Approaches. Routledge.

Love, P.E.D., Edwards, D.J., Watson, H., & Davis, P.R. (2010). Rework in civil infrastructure projects: Determination of cost predictors. Journal of Construction Engineering and Management, 136(3), 275–282.

Project Management Institute. (2017). A Guide to the Project Management Body of Knowledge (PMBOK Guide). 6th ed. Project Management Institute.

Project Management Institute. (2021). A Guide to the Project Management Body of Knowledge (PMBOK® Guide) (7th ed.). Project Management Institute.

Sugiyono. (2017). Statistics for research. Alphabet

Too, E. G., & Weaver, P. (2014). The management of project management: A conceptual framework for project governance. International Journal of Project Management, 32(8), 1382–1394.