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Analysis of the Influence of Environmental Factors, Wage Factors, Coordination and Worker Productivity that Influence the Performance of Government Project Completion Time in Pangkalpinang City

Fanta Wahyu Giarta[1], Agus Suroso[2]
Fakultas Teknik Universitas Mercu Buana Jakarta, Indonesia
Email: fanta.ghemm@gmail.com[1], agus_suroso@mercubuana.ac.id[2]

ABSTRACT

Delays in government construction projects are a common issue in many regions, including Pangkalpinang City, which is highly dependent on external material supplies. Geographic conditions and the complexity of project management often result in project completion times that do not align with contractual agreements. This study aims to analyze the influence of environmental factors, wage systems, coordination, and worker productivity on the completion time performance of government building construction projects in Pangkalpinang City. Using descriptive quantitative methods and multiple linear regression analysis, the results of the study indicate that these four variables simultaneously contribute 85.4% to project completion. The wage factor is the dominant factor with a contribution of 72.59%, indicating that an effective wage system can improve the efficiency of project completion. Possible solutions include providing wages based on skills, work duration, performance, type of work, and incentives to increase worker productivity. This study provides recommendations for project managers to optimize workforce management strategies to ensure projects are completed on time with optimal quality.

KEYWORDS *environmental factors, wage systems, coordination, worker productivity, project performance*

INTRODUCTION

In accordance with the *Regulation of the Minister of Public Works and Public Housing of the Republic of Indonesia Number 22/PRT/M/2018* concerning the Construction of State Buildings, in Chapter I General Provisions Article 1, *State Buildings* are buildings for official purposes that are state or regional property and are procured with funding sources originating from APBN funds, APBD, and/or other legitimate acquisitions. In general, a project is a work activity carried out based on a request from an owner or work owner who wants to achieve a certain goal and is implemented by the work executor in accordance with the wishes of the owner or project owner and existing specifications. In the implementation of the project, the project owner and project executor have rights received and obligations that must be fulfilled according to the time period mutually agreed upon between the project owner and project executor (Bakhtiyar et al., 2012; Bansambua, 2019; Hidayat & Suripto, 2019; Sianipar, 2013; Yuliana, 2013).

Construction project delays mean an increase in the project completion time beyond what is planned and outlined in the contract documents (Rebut et al., 2018; Wirabakti et al., 2017). Late completion of work indicates a loss in productivity, which will undoubtedly result in financial waste, both in the form of direct funding for government projects and increased investment losses on private projects.

Project management is a critical factor supporting project success because it involves the arrangement of resources within the boundaries of scope, time, cost, and quality that have been determined to complete the project. Project management includes planning, scheduling, and project control. In reality, the implementation of construction projects often encounters obstacles that result in delays in work completion, causing the work completion time to not align with what is stipulated in the contract document (Wirabakti et al., 2014). Delays cause losses for related parties, especially the owner and contractor, because they are generally accompanied by conflicts, demands for additional time and costs, and deviations in the quality of project completion. Various methods are used to avoid problems that result in delays and losses (Bakhtiyar et al., 2012).

The Bangka Belitung Islands Province, with its capital city of Pangkalpinang, holds a strategic position as a city located on the economic route of Bangka Island. As an archipelago, it heavily relies on the transportation sector, including land, sea, and air transportation, to meet its construction material needs (Dharmawan et al., 2019; Hudoyo et al., 2023; Mahapatni et al., 2022; Ramadhan, 2021; Sigit & Nurhidayat, 2019). This means that Pangkalpinang City in particular, and Bangka Island in general, depend on external sources, such as Palembang and its surroundings, as well as Jakarta, to fulfill their construction material needs, including cement, iron, and other materials. The city also serves as a corridor and a development hub in the Bangka Belitung region. In 2020, the population of Pangkalpinang City reached 236,267 (BPS Pangkalpinang City, 2023). Astronomically, Pangkalpinang City is located between 2°4’–2°10’ South Latitude and 106°4’–106°7’ East Longitude. Administratively, Pangkalpinang City is divided into 7 sub-districts, namely Bukit Intan, Girimaya, Taman Sari, Gerunggang, Rangkui, Gabek, and Pangkalbalam Sub-districts, with a total area of 118.41 km² (Bappeda Pangkalpinang City, 2020).

The success of a construction project can be measured by two things: the profits obtained and the timeliness of completion. The sooner a construction project is completed, the sooner potential buyers or owners can use the building, and the sooner the developer can realize profit. Conversely, if a delay occurs, this delay can become an obstacle to development and can be caused by several factors (Sakinah, 2015). Delays in construction projects mean an increase in the completion time that has been planned and stated in the contract documents. Completing work not on time decreases productivity levels, and of course, this results in wasteful funding, both in the form of direct funding spent on project work and other associated costs. Therefore, efforts to complete projects on time are critical to achieving project objectives, namely compliance with the planned cost, quality, and time. Given the pattern of dependence on materials from outside the island, Pangkalpinang often encounters obstacles. For example, delays in the arrival of materials and unavailability of materials when needed in the local area — such as main materials like cement, iron, and others — negatively impact the continuity of physical construction projects. Therefore, it is necessary to conduct research on the factors that influence delays in building project implementation in Pangkalpinang City.

Pangkalpinang City is one of seven regencies/cities in the Bangka Belitung Islands Province. Geographically, Pangkalpinang City holds strategic importance, serving as the provincial capital and a hub for various sectors. As the provincial capital, Pangkalpinang City serves as a benchmark for development throughout the Bangka Belitung Islands. This ensures

that each development project has a significant impact and influence on the development of other regions, particularly the economic sector.

The availability of infrastructure plays a key role as a driver in the economic sector, which will later be able to drive the development of other related sectors. Infrastructure can be defined as the facilities or basic structures that are built and needed for the functioning of the social and economic systems of society (Maulina & Mahmuddin, 2020). Pangkalpinang City is a benchmark for various aspects of development including the construction and distribution of basic infrastructure such as improvements in the quality of roads and bridges including drainage, enhancement of housing quality, improvements to the distribution and quality of clean water, and the provision of green open spaces for the realization of a quality environment (Tristania & Nursin, 2019; Wahyuningtyas & Waskito, 2021). The preparation of a study to identify issues and potentials of urban infrastructure in Pangkalpinang City is very vital for the implementation of infrastructure development in the city (Gellysa Urva & Aminah, 2022; Haseli & Hasan Ebdali, 2022; Simanjuntak et al., 2022; Sugiono et al., 2022; Surachmad et al., 2018; Tabrani et al., 2023).

From 2021 to 2023, Pangkalpinang City allocated an infrastructure development budget based on the 2018–2023 Regional Medium-Term Development Plan (*RPJMD*). From planning to implementation, the Pangkalpinang City government strives to minimize development issues. Mitigating potential issues significantly contributes to the timely completion of construction.

Construction project delays are a prevalent issue in the development of government infrastructure, particularly in Pangkalpinang City, where geographical and logistical challenges exacerbate the problem. Previous studies have identified various factors contributing to delays, but gaps remain in understanding the interplay of environmental, wage, coordination, and productivity factors (Karthic et al., 2022). For instance, Andi H. Rizal et al. (2023) focused on labor-related issues such as strikes and equipment delays in the Kupang Vertical UPT Hospital project, highlighting labor as the dominant cause of delays. However, their study overlooked environmental and coordination factors, which are critical in regions like Pangkalpinang, where material supply chains are vulnerable to weather and logistical disruptions. Similarly, Bakhtiyar et al. (2012) examined delays in Lamongan City's building projects, emphasizing contractor-related issues but neglecting the systemic impact of wage systems and worker productivity on project timelines (Arumningsih, 2012; Enrico & Sumarman, 2020; Ginting et al., 2023; Hai Nguyen, 2020; Johari & Jha, 2020; Kala Kamdjoug, 2023; Kuswandari et al., 2018).

The purpose of this study is to identify, analyze, and evaluate the influence of environmental factors, wages, coordination, and worker productivity on the completion time of government building projects in Pangkalpinang City. The findings are particularly relevant given the city's reliance on external material sources and its strategic role as a regional development hub. The goal is to improve efficiency and reduce delays in government infrastructure projects. The results will benefit project managers, policymakers, and stakeholders by informing strategies to enhance workforce management and logistical planning, ultimately ensuring timely project delivery with optimal quality.

METHOD

This research is a quantitative descriptive study using a survey method. The survey method aims to provide a detailed overview of the background, characteristics, and distinctive features of a general case or event. Furthermore, it seeks to create a systematic, factual, and accurate description or depiction of the facts, characteristics, and relationships between the phenomena being investigated. The instrument used was a closed-ended questionnaire. The indicators for the research variables were then elaborated by the author into a number of questions to obtain primary data. Quantitative research is developed using systematic models, theories, and/or hypotheses (Hermawan, 2019).

The descriptive method is a method used to analyze data by describing the collected data as it is, without intending to make general conclusions, while quantitative research is a research method based on positive philosophy, used to study certain populations or samples, where sampling techniques are generally carried out randomly, and data analysis is quantitative with the aim of testing the established hypothesis (Sugiyono, 2013).

This research uses a quantitative descriptive research method, which identifies existing facts and phenomena and conducts research to gather factual information. The data obtained will be used as research variables. The next step is to measure the relationship or correlation and influence between two or more variables. This method also involves evaluating and comparing previous efforts to address similar situations and problems, and the results can be used to develop plans or solutions for future decision-making (Moh. Nazir, 2005).

This research process includes a research flow from the beginning to the discovery of a hypothesis to answer the problem formulation through scientific research. The process includes stages aligned with the research framework, which has been developed in the form of a flowchart. The flowchart is based on the formulation and objectives of the research to be achieved.

This research begins by formulating the problem to obtain a research topic supported by a literature review. The literature review was conducted by searching for and reading international and domestic journals that are somewhat related to the research topic. This was done to identify any gaps in the research and to determine whether this study was the first of its kind. After that, the research concept and hypotheses were formulated, along with the appropriate method to address the problem statement.

RESULT AND DISCUSSION

DATA ANALYSIS

Instrument Validity and Reliability Test

Validity Test

In this study, a validity test was conducted with H0:$\rho \leq 0$ (invalid statement item) and H0:$\rho > 0$ (valid statement item). The test results showed that all r values were > r table (with df = 50 – 2 = 48 and a 5% significance level, namely 0.284), thus concluding that all statement items were valid. The next step was to examine the Cronbach's Alpha value. A latent variable is considered reliable if its Cronbach's Alpha value is > 0.7. It was found that all variables had Cronbach's Alpha values > 0.7, indicating that they were highly reliable. The following are the results of the validity test conducted on 50 respondents:

The questionnaire data was tested for validity to determine the validity of the questionnaire. The test requirements were as follows:

1. Based on Pearson Correlation:

   rcount > rtable; this means the questionnaire results are valid; rcount < rtable; this means the questionnaire results are invalid.

   Find the rtable value from the rtable value distribution table with a significance level of 5%. With an N value of 43, the rtable value is 0.301.

2. Based on Significant Correlations:
   a. Sig (2-tailed) < 0.05 and a positive Pearson Correlation; this means the questionnaire results are valid.
   b. Sig (2-tailed) < 0.05 and a negative Pearson Correlation; this means the questionnaire results are invalid.
   c. Sig (2-tailed) > 0.05; this means the questionnaire results are invalid.

The results of the validity test using SPSS can be seen in the following table:

Table 1. Results of Validity Test of Variable X1

Indicator Code	Testing	Calculation Amount	Based on r-count values (*Pearson Correlation*)	Based on Sig Values
X1.1	*Pearson Correlation*	1.000	> 0.279, Valid	Sig. (2-tailed) < 0.05 and *Pearson Correlation* Positive, Means the questionnaire results are valid
	Sig. (2-tailed)	0.000		
X1.2	*Pearson Correlation*	0.557	> 0.279, Valid	Sig. (2-tailed) < 0.05 and *Pearson Correlation* Positive, Means the questionnaire results are valid
	Sig. (2-tailed)	0.000		
X1.3	*Pearson Correlation*	0.623	> 0.279, Valid	Sig. (2-tailed) < 0.05 and *Pearson Correlation* Positive, Means the questionnaire results are valid
	Sig. (2-tailed)	0.000		

Source: Processed from Research Survey Data (2025)

Table 2. Results of the Validity Test of Variable X2

Indicator Code	Testing	Calculation Amount	Based on the r-calculated value (*Pearson Correlation*)	Based on Sig Values
X2.1	*Pearson Correlation*	1.000	> 0.279, Valid	Sig. (2-tailed) < 0.05 and *Pearson Correlation* Positive, Means Valid Questionnaire Results
	Sig. (2-tailed)	0.000		
X2.2	*Pearson Correlation*	0.477	> 0.279, Valid	Sig. (2-tailed) < 0.05 and *Pearson Correlation* Positive, Means Valid Questionnaire Results
	Sig. (2-tailed)	0.000		
	Pearson Correlation	0.527		Sig. (2-tailed) < 0.05 and

X2.3	Sig. (2-tailed)	0.000	> 0.279, Valid	*Pearson Correlation* Positive, Means Valid Questionnaire Results
X2.4	*Pearson Correlation*	0.545	> 0.279, Valid	Sig. (2-tailed) < 0.05 and *Pearson Correlation* Positive, Means Valid Questionnaire Results
	Sig. (2-tailed)	0.000		
X2.5	*Pearson Correlation*	0.441	> 0.279, Valid	Sig. (2-tailed) < 0.05 and *Pearson Correlation* Positive, Means Valid Questionnaire Results
	Sig. (2-tailed)	0.001		

Source: Processed from Research Survey Data (2025)

Table 3. Validity Test Results for Variable X3

Indicator Code	Testing	Calculation Amount	Based on the r-calculated value (*Pearson Correlation*)	Based on Sig Values
X3.1	*Pearson Correlation*	1.000	> 0.279, Valid	Sig. (2-tailed) < 0.05 and *Pearson Correlation* Positive, Means Valid Questionnaire Results
	Sig. (2-tailed)	0.000		
X3.2	*Pearson Correlation*	0.455	> 0.279, Valid	Sig. (2-tailed) < 0.05 and *Pearson Correlation* Positive, Means Valid Questionnaire Results
	Sig. (2-tailed)	0.001		
X3.3	*Pearson Correlation*	0.556	> 0.279, Valid	Sig. (2-tailed) < 0.05 and *Pearson Correlation* Positive, Means Valid Questionnaire Results

Source: Processed from Research Survey Data (2025)

Table 4. Results of the Validity Test of Variable X4

Indicator Code	Testing	Calculation Amount	Based on the r-calculated value (*Pearson Correlation*)	Based on Sig Values
X4.1	*Pearson Correlation*	1.000	> 0.279, Valid	Sig. (2-tailed) < 0.05 and *Pearson Correlation* Positive, Means Valid Questionnaire Results
	Sig. (2-tailed)	0.000		
X4.2	*Pearson Correlation*	0.342	> 0.279, Valid	Sig. (2-tailed) < 0.05 and *Pearson Correlation* Positive, Means Valid Questionnaire Results
	Sig. (2-tailed)	0.000		
X4.3	*Pearson Correlation*	0.711	> 0.279, Valid	Sig. (2-tailed) < 0.05 and *Pearson Correlation* Positive, Means Valid Questionnaire Results
	Sig. (2-tailed)	0.000		
X4.4	*Pearson Correlation*	0.485	> 0.279, Valid	Sig. (2-tailed) < 0.05 and *Pearson Correlation* Positive, Means Valid
	Sig. (2-tailed)	0.003		

				Questionnaire Results
X4.5	*Pearson Correlation*	0.349	> 0.279, Valid	Sig. (2-tailed) < 0.05 and *Pearson Correlation* Positive, Means Valid Questionnaire Results
	Sig. (2-tailed)	0.000		

Source: Processed from Research Survey Data (2025)

Table 5. Results of the Validity Test for Variable Y

Indicator Code	Testing	Calculation Amount	Based on the r-calculated value (*Pearson Correlation*)	Based on Sig Values
Y1	*Pearson Correlation*	1.000	> 0.279, Valid	Sig. (2-tailed) < 0.05 and *Pearson Correlation* Positive, Means Valid Questionnaire Results
	Sig. (2-tailed)	0.000		
Y2	*Pearson Correlation*	0.567	> 0.279, Valid	Sig. (2-tailed) < 0.05 and *Pearson Correlation* Positive, Means Valid Questionnaire Results
	Sig. (2-tailed)	0.000		

Source: Processed from Research Survey Data (2025)

Reliability Test

Reliability testing was conducted using the Cronbach's alpha coefficient. If the Cronbach's alpha coefficient value obtained from the data is greater than 0.6, the instrument is considered capable of reliably obtaining the desired data. The Cronbach's alpha coefficient value was calculated using SPSS.

According to Imam Ghozali (2005), a questionnaire is considered reliable if the Cronbach's alpha value is >0.6. The results of the reliability test using SPSS can be seen in the following table:

Table 6. Results of the Reliability Test for Variable X1

Indicator Code	*Scale Mean if Item Deleted*	*Scale Variance if Item Deleted*	*Corrected Item-Total Correlation*	*Cronbach's Alpha if Item Deleted*	Conclusion = Reliable If *Alpha Cronbach's* > 0.6
Environmental Factors (X1)					
X1.1	7.92	2.728	0.683	0.661	Reliable
X1.2	8.08	2.565	0.580	0.762	Reliable
X1.3	7.96	2.447	0.627	0.710	Reliable

Source: Processed from Research Survey Data (2025)

Table 7. Results of the Reliability Test for Variable X2

Indicator Code	*Scale Mean if Item Deleted*	*Scale Variance if Item Deleted*	*Corrected Item-Total Correlation*	*Cronbach's Alpha if Item Deleted*	Conclusion = Reliable When *Alpha Cronbach's* > 0.6
Wage Factor (X2)					
X2.1	16.34	7.249	0.372	0.870	Reliable
X2.2	16.44	6.333	0.551	0.841	Reliable
X2.3	16.46	6.539	0.557	0.836	Reliable
X2.4	16.48	6.418	0.517	0.840	Reliable
X2.5	16.52	5.969	0.623	0.832	Reliable

Source: Processed from Research Survey Data (2025)

Table 8. Results of Reliability Test of Variable X3

Indicator Code	*Scale Mean if Item Deleted*	*Scale Variance if Item Deleted*	*Corrected Item-Total Correlation*	*Cronbach's Alpha if Item Deleted*	Conclusion = Reliable If *Alpha Cronbach's* > 0.6
Coordination (X3)					
X3.1	8.34	1.698	0.596	0.623	Reliable
X3.2	8.34	1.943	0.518	0.712	Reliable
X3.3	8.52	1.520	0.597	0.624	Reliable

Source: Processed from Research Survey Data (2025)

Table 9. Results of Reliability Test of Variable X4

Indicator Code	*Scale Mean if Item Deleted*	*Scale Variance if Item Deleted*	*Corrected Item-Total Correlation*	*Cronbach's Alpha if Item Deleted*	Conclusion = Reliable When *Alpha Cronbach's* > 0.6
Wage Factor (X2)					
X4.1	16.36	7.378	0.598	0.787	Reliable
X4.2	16.46	6.988	0.602	0.786	Reliable
X4.3	16.44	6.782	0.729	0.749	Reliable
X4.4	16.88	7.373	0.585	0.791	Reliable
X4.5	16.58	7.310	0.546	0.803	Reliable

Source: Processed from Research Survey Data (2025)

Table 10. Results of the Reliability Test for Variable Y

Indicator Code	*Scale Mean if Item Deleted*	*Scale Variance if Item Deleted*	*Corrected Item-Total Correlation*	*Cronbach's Alpha if Item Deleted*	Conclusion = Reliable If *Cronbach's Alpha* > 0.6
Time (Y)					
Y.1	4.24	0.594	0.567	0.668	Reliable
Y.2	4.14	0.653	0.567	0.665	Reliable

Source: Processed from Research Survey Data (2025)

Research Findings

The research that has been conducted states that all research variables, namely Environmental Factors (X1), Labor Factors (X2), Coordination (X3), and Worker Productivity Factors (X4) can affect the performance of the completion time of government building construction projects in Pangkalpinang City. This is almost in line with previous research (Andi H. Rizal et al, 2023) entitled "Inhibiting Factors That Influence the Performance of Building Construction Implementation Time" which observed the performance of implementation time on the Kupang Vertical UPT Hospital building project and effective ways to overcome obstacles that occur, The results of the analysis show that the dominant factor according to all respondents is the labor factor (beta value 1.001), according to the contractor, namely the request for changes to completed work, high rainfall and stormy winds, according to the supervisory consultant, namely labor strikes, limited use of technology and the length of equipment delivery and also according to the owner, namely labor strikes. The difference between this research and the research conducted by (Andi H. Rizal et al, 2023) is that this research adds environmental factor variables (X1) and Coordination (X3) which are proven to affect the performance of completion time in government building construction projects (Hair et al., 2022; Husen, 2019; Larsen et al., 2017; Robbins, 2019; Sugiyono, 2019; Trauner, 2019; Widayat, 2019).

CONCLUSION

Based on the research results, environmental factors, wage systems, coordination, and worker productivity have a significant influence on the performance of the completion time of government building construction projects in Pangkalpinang City, with a combined influence contribution of 85.4%. Among these factors, the wage system is the dominant factor affecting the performance of project completion time, with a contribution of 72.59%. Therefore, controlling the wage system is the main step that must be taken by project managers to improve the efficiency of project completion time. This study also shows that the results are in line with previous research by Andi H. Rizal et al. (2023), although this study added the variables of environmental and coordination factors, which have been proven to influence project completion time. To improve the efficiency of project completion time, solutions that can be implemented primarily focus on the wage system, such as providing wages based on skills, length of service, work performance, type of work, and offering incentives for workers who are able to complete tasks faster with good quality. With the implementation of this strategy, it is hoped that the completion time of government building construction projects can become more optimal and efficient.

REFERENCES

Apriani, W., Suryanita, R., & Lubis, F. (2020). Evaluasi Kinerja Struktur Jembatan Pelengkung akibat Beban Gempa dengan Analisis Riwayat Waktu. *Jurnal Infrastruktur*, *6*(2), 151-156.

Arumningsih. (2012). Perencanaan Dan Estimasi Biaya Pada Proyek Pembangunan Jembatan Patihan Kabupaten Sragen. *Jurnal Teknik Sipil dan Arsitektur*, *12*(16).

Bakhtiyar, A., Soehardjono, A., & Hasyim, M. H. (2012). Analisis faktor-faktor yang mempengaruhi keterlambatan proyek konstruksi pembangunan gedung di kota lamongan. *Rekayasa Sipil*, *6*(1), 55-66.

Bansambua, E. M. (2019). Faktor-Faktor yang Menyebabkan Keterlambatan Waktu

Pelaksanaan Proyek pada Pekerjaan Jalan dan Jembatan di Kabupaten Morowali. *Jurnal Maroso*, *1*(01).

Covid-19 Pada Proyek Jembatan Ploso Jombang Menggunakan Analisis

Dengan Penerapan Metode Time Cost Trade Off Pada Proyek Pembangunan

Dharmawan, R. D., Safarizki, H. A., & Firdausi, A. A. Evaluasi Efektivitas Keputusan Addendum Proyek Terhadap Waktu Pekerjaan Proyek Berbasis Earned Value Method. *J@ ti Undip: Jurnal Teknik Industri*, *18*(1), 51-61.

Enrico, Y., & Sumarman, S. (2020). Manajemen Konstruksi pada proyek pembangunan Jembatan untuk akses ke lokasi PT. Pertamina MB-

Gellysa Urva, & Aminah, S. (2022). Implementasi Metode Analytic Hierarchy Process dalam Pemilihan Proyek Kontruksi. *JURNAL UNITEK*, *15*(2), 141-

Ginting, R., Purba, C. E., & Sinulingga, H. P. (2023). Analisa Manajemen Konstruksi Bangunan Bawah Pada Proyek Pembangunan Jembatan Overpass Ruas Kisaran-Indrapura STA 132+ 023. *JURNAL Ilmiah Teknik Sipil*, *12*(2), 291-296.

Hai Nguyen, L. (2020). Empirical analysis of a management function's failures in construction project delay. *Journal of Open Innovation: Technology, Market, and Complexity*, *6*(2), 26.

Hair, J. F., Babin, B. J., Anderson, R. E., & Black, W. C. (2022). Multivariate data analysis (8th ed.). London, United Kingdom: Cengage Learning.

Haseli, B., & Hasan Ebdali, E. (2022). Ranking of Project Delay Factors in the Construction of Civil Infrastructure, Case study: Tehran Highway Bridge. *New Approaches in Civil Engineering*, *5*(4), 1-13.

Hidayat, A., & Suripto, H. (2019). Klasifikasi Pengendalian Material dalam Mencegah Keterlambatan Proyek di Kabupaten Rokan Hulu. *Aptek*, 91-96.

Hudoyo, C. P., Rustendi, I., Sismiani, A., & Sunarwono, B. E. (2023). Evaluasi Kinerja Biaya dan Waktu Proyek Konstruksi Jalan dan Jembatan Kawasan Industri Terpadu (KIT) Batang dengan Metode Earned Value. *Proceedings Series on Physical & Formal Sciences*, *6*, 42-47.

Husen, A. (2019). Manajemen Proyek (revisied). *Yogyakarta: Cv. Andi Offset*. Intan, S. K., Muhyi, A., & Tengku, N. M. (2018). Alternatif Percepatan Waktu

Jakarta; Erlangga.

Jembatan (Studi Kasus: Proyek Pekerjaan Jembatan Rangka Baja Namploh Kec. Samalanga Kab. Bireuen, Aceh). *Portal: Jurnal Teknik Sipil*, *10*(2), 19-27.

Johari, S., & Jha, K. N. (2020). Interrelationship among belief, intention, attitude, behavior, and performance of construction workers. *Journal of management in engineering*, *36*(6), 04020081.

Kala Kamdjoug, J. R. (2023). Change management and digital transformation project success in SMEs located in the Democratic Republic of the Congo. *Journal of Enterprise Information Management*.

Karthic, Prabakara, Sindhu Vaardini and A. Aswin bharath. Maximizing Real-Time Monitoring For Effective Delay Analysis In Bridge Construction Projects With Evm Scheduling. *International Journal of Scientific Research in Engineering and Management (IJSREM). 8*(1), DOI: 10.55041/IJSREM27859

Kuswandari, A. D., Koesmargoro, A., & Ervianto, W. I. (2018). Pengaruh Dampak Contract Change Order Terhadap Kinerja Kontraktor Proyek Studi Kasus: Rehabilitasi Jembatan Ngablak. *Jurnal Teknik Sipil*, *14*(4), 255-282.

Larsen, K. R., Michie, S., Hekler, E. B., Gibson, B., Spruijt-Metz, D., Ahern, D., ... & Yi, J. (2017). Behavior change interventions: the potential of ontologies for advancing science and practice. *Journal of behavioral medicine*, *40*, 6- 22.

Mahapatni, I. A. P. S., Putra, C., & Murwanta, K. E. (2022). Analisis Kinerja Waktu dan Biaya

Pelaksanaan Proyek dengan Metode Earned Value Pada Proyek Pembangunan Jembatan Pangkung Dalem Ruas Jalan Gitgit- Wanagiri. *Jurnal Ilmiah Kurva Teknik*, *11*(2), 17-25.

Maulina, F., & Mahmuddin, M. (2020). Identifikasi Risiko Pada Proyek Pembangunan Penggantian Jembatan Baja Di Aceh Jaya Dan Aceh Besar. *Journal of The Civil Engineering Student*, *2*(3), 211-217.

Nasution, W. S. I. (2012). *Hotel Forest di Bukit Lawang Tema Green Architecture* (Doctoral dissertation).

Ramadhan, F. (2021). *Evaluasi Penjadwalan Kurva–S Dan Critical Path Method (Cpm) Dalam Mengendalikan Pelaksanaan Pondasi Bore Pile (Studi Pada Pekerjaan Jembatan di Jalan Relokasi Bendungan Tapin)* (Doctoral dissertation, Universitas Islam Kalimantan MAB).

Rebut, R., Mangare, J. B., & Walangitan, D. R. (2018). Analisis Perbandingan Tenaga Kerja Lokal Dan Tenaga Kerja Luar Dalam Jasa Konstruksi Di Manado (Studi Kasus: Transmart). *Jurnal Sipil Statik*, *6*(3).

Robbins, Stephen. 2019. *Perilaku Organisasi*. Edisi Kesepuluh. Jakarta; Indeks. Sari, A. M. (2021). Faktor Yang Berhubungan Dengan Program Penanggulangan

Sianipar, H. B. (2013). Analisis Faktor-Faktor Penyebab Keterlambatan Penyelesaian Proyek Konstruksi Pengaruhnya Terhadap Biaya.

Sigit, A., & Nurhidayat, H. (2019). Penerapan Earned Value Concept pada Proyek Penggantian Jembatan Ruas Nanga Tepuai–Nanga Semangut Kalimantan Barat. *Jurnal Teknisia*, *24*(2).

Simanjuntak, I. J., Siagian, R. T., Prasetyo, R., Rozak, N. F., & Purba, H. H. (2022). Manajemen Risiko Pada Proyek Konstruksi Jembatan: Kajian Literatur Sistematis. *Jurnal Teknologi dan Manajemen*, *20*(1), 59-76.

Sugiono, G. J., Antonio, J. K., & Ratnawidjaja, S. (2022). Analisis Faktor-Faktor Yang Mempengaruhi Cost Overrun Dan Pengaruhnya Terhadap Keuangan Proyek Konstruksi Di Surabaya. *Jurnal Dimensi Pratama Teknik Sipil*, *11*(2), 76-83.

Sugiyono (2019). *Metode Penelitian Kunatitatif Kualitatif dan R&D*. Bandung: Alfabeta.

Surachmad, N., Azis, S., & Putranto, E. H. D. (2018). Faktor-Faktor Risiko Kegagalan Pencapaian Sasaran Proyek Tepat Waktu Dan Mutu Pada PembangunanProyek Jembatan Di Kabupaten Probolinggo. *Infomanpro*, *7*(1), 1-12.

Tabrani, N., Mulia, A. P., & Anas, R. (2023). Analisis Faktor Keterlambatan Pelaksanaan Proyek Jembatan di Provinsi Sumatera Utara. *Jurnal Syntax Transformation*, *4*(1), 119-133.

Trauner, T. J. (2019). *Construction delays: Understanding them clearly, analyzing them correctly*. Butterworth-Heinemann.

Tristania, A., & Nursin, A. (2019). Tinjauan Pengendalian Waktu Pekerjaan Jembatan Anak CBL Pada Proyek Jalan Tol Cibitung–Cilincing Seksi II. In *Prosiding Seminar Nasional Teknik Sipil* (Vol. 1, No. 1, pp. 639-647).

Wahyuningtyas, A., & Waskito, J. P. H. (2021). Analisa faktor penyebab keterlambatan proyek pembangunan jembatan joyoboyo. *axial: jurnal rekayasa dan manajemen konstruksi*, *9*(2), 071-078.

Widayat, W. W. (2019). *Pengantar Manajemen Proyek & Ekonomi Teknik*. Jakarta: Jurusan Tektik SIPIL UI

Wirabakti, D. M., Abdullah, R., & Maddeppungeng, A. (2017). Studi Faktor-Faktor Penyebab Keterlambatan Proyek Konstruksi Bangunan Gedung. *Konstruksia*, *6*(1).

Yuliana, C. (2013). Analisis Faktor Penyebab Terjadinya Keterlambatan Pada Pelaksanaan Proyek Pembangunan Jembatan. *INFO-TEKNIK*, *14*(2), 114- 125.