

**AN ANALYSIS OF DELAYS PROJECT ON CONSTRUCTION PHASE
(CASE STUDY ON THE PROJECT APARTEMEN GRAND TAMAN MELATI 2
MARGONDA DEPOK)**

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Abstract

Apartment Grand Taman Melati 2 Margonda Depok built to meet the housing needs of the students. During the construction period there was a delay in completion of work that was not in accordance with the work schedule. The concluded of the research problem is (1) What are the factors of project delay in this study? (2) What are the results of the analysis of the project delay factor on performance? (3) What are the recommendations for the research? Variables that are used are the owners, planners, construction management and contracting. The conclusion is there is a significant influence between the role of project delay with performance seen from the calculated F test value higher than the F table ($3.20 > 2.87$).

Keywords: Project Delay, Owner, Planner, MK, Contractor and Performance.

1. Introduction

Grand Taman Melati Margonda II Apartment was built based on the results of the feasibility of calculating a large demand for nearby student residences, especially University of Indonesia students. When the construction period is running, a lot of problems that occur such as a narrow location so it needs attention to the stock of material. The coordination of planning drawings on the application in the field was also a minor factor during the construction of the Margonda II Grand Taman Melati Apartment Project. Other constraints such as the delay in land handover for one month from the owner to the implementing party. The definition of delay according to Ervianto (1998) is as an implementation time that is not utilized in accordance with the activity plan so that it causes one or several of the following activities to be delayed or not completed according to the planned schedule.¹ Delay in a building construction project can be due to many technical and non-

¹ Ervianto, Wulfram I. 2004. *Teori–Aplikasi Manajemen Proyek Konstruksi*. Yogyakarta : Andi.

technical factors, it is necessary to study more closely what factors influence the delay of the building construction project.

2. Literature Review

According to Hafnidar (2016), a Project is an activity carried out with limited time and resources to achieve the specified final results. The word "construction" can be defined as the order of the elements of a building in which each part is in accordance with its function.² According Wulfram (2004) Construction projects can be divided into two types of groups of buildings which are :³

1. Building: with characteristics : construction projects produce places where people work or live and work is carried out in a relatively narrow location. Management is needed, especially for work progressing.
2. Civil Building: with Characteristics: construction projects carried out to control nature so that it is useful for human interests, work is carried out on a wide or long location and management is needed to solve problems.

According to Suharto (1999), many activities and parties involved in implementing construction projects pose many complex problems.⁴

The complexity of the project depends on:

1. Number of types of activities in the project.
2. Types and number of relationships between groups (organizations) in the project itself.
3. Types and number of relationships between activities (organizations) in the project with external parties.

This complexity depends on the size of the project. Small projects can be more complex than larger projects. Complexity requires arrangement and control in such a way that there are no conflicts in project implementation, it is necessary to have a reliable and resilient project management to sustain project implementation.

According to Suharto (1999), the objectives of the project management process are as follows :⁵

1. All of activities can be on time, in this case there is no delay in completion of a project.
2. Appropriate costs, which means that there are no additional costs outside of planned costs that have been planned.
3. Quality according to requirements.

² Rani, Hafnidar A. 2016. *Manajemen Proyek Konstruksi*. Yogyakarta: CV. Budi Utama

³ Ervianto, Wulfram I. 2004. *Teori–Aplikasi Manajemen Proyek Konstruksi*. Yogyakarta : Andi.

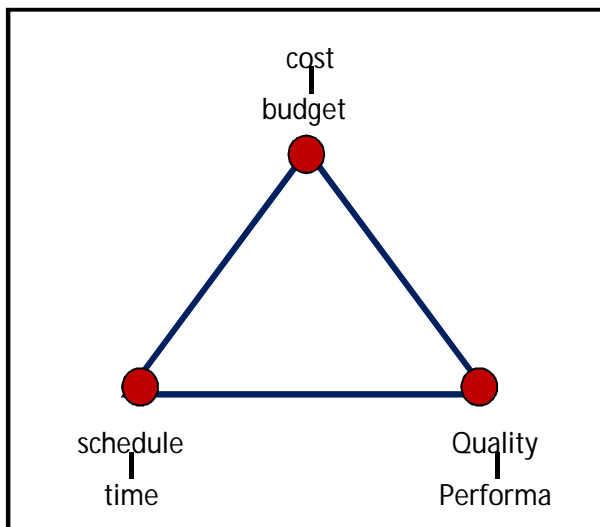
⁴ Soeharto, Iman. 1999. *Manajemen Proyek dari Konseptual sampai Operasional Jilid II*. Jakarta : PT. Gelora Aksara Prata

⁵ Soeharto, Iman. 1998. *Manajemen Proyek dari Konseptual sampai Operasional Jilid II*. Jakarta : PT. Gelora Aksara Prata.

4. Process activities according to requirements.

Each project has specific objectives, for example road construction, housing construction, building offices or factory installations. In the process of achieving these objectives there are limitations that must be met, namely the amount of costs allocated, schedules, and quality that must be met. These three things are important parameters for the implementation of projects that are often associated as project targets. The three restrictions above are also called triple constraint.⁶

Figure 1. *Triple Constraint*

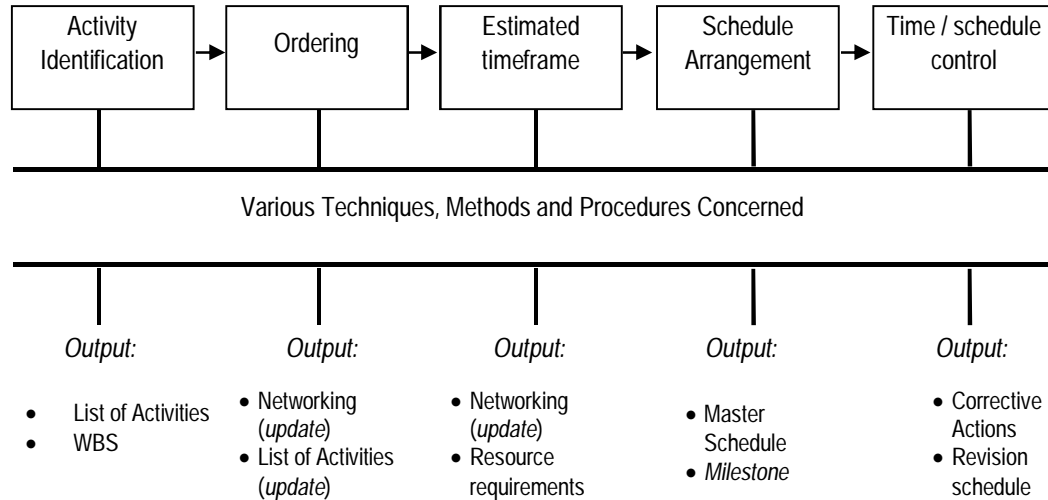


Project budgets must be completed at a cost that does not exceed the budget. For projects that involve large amounts of funds and years of work schedules, the budget is not only determined by the total project, but is broken down into its components or per certain period (for example, per quarter) according to the amount needed. Project Schedule must be carried out in accordance with the specified time period and end date. If the final product is a new product, the delivery may not exceed the specified time limit. Product Quality or the results of project activities must meet the required specifications and criteria. For example, if the results of the project activity take the form of a factory installation, the criteria that must be appropriate are that the plant must be able to operate satisfactorily within the specified time period and according to quality requirements means to be able to fulfill the intended task.

Time or schedule is one of the main objectives of the project. Delay will result in losses, such as additional costs, lost opportunity for products to enter the market, and others. Time management has the main goal so that the project is completed according to or faster than planned by taking into account the cost, quality and scope of the project. The following figure shows the time management process.

⁶ Soeharto, Imam Ir. 1995. *Manajemen Proyek dari Konseptual sampai Operasional* Jakarta : Erlangga.

Figure 2. time management process



Project delays are time during which a part of the construction project is extended or not carried out in accordance with the agreed agreement (Callahan et al., 1992).⁷

According to Levis and Atherley (1996), if a job has been targeted to be completed at a predetermined time but for some reason it cannot be fulfilled then it can be said the work is experiencing delays.⁸

According to PMBOK (Project Management Institute Body of Knowledge) the definition of risk management is a formal process in which risk factors are systematically identified, analyzed, responded to, and controlled. Is a formal method of systematic management that concentrates on identifying and controlling areas or events that have the potential to cause undesirable changes.⁹

in the context of a project, is an art and science and technology in identifying, analyzing, and responding to the risk factors that exist during the implementation of a project.

Six stages in risk management are risk management planning, risk identification, qualitative risk analysis, quantitative risk analysis, risk response planning and risk control and monitoring

According to Assaf and Al-Hejji (1995), the causes of project delays can be seen in terms of material, labor, equipment, cost or capital, design changes, relationships with related agencies,

⁷ Callahan M.T., 1992. *Construction Project Scheduling*, McGraw Hill, Inc.

Dipohusodo, Istimawan. 1996. *Manajemen Proyek dan Konstruksi Jilid* . Yayasan Kanisius.

⁸ Levis and Atherley. (1996). *Delay construction*. Langford: Cahner Books Internasional.

⁹ Project Management Institute (2017), *A Guide to the: Project Management of Knowledge (PMBOK Guide)*, 6th edition, Newtown Square PA: Project Management Institute.

scheduling and control, slow monitoring and testing procedures used in the project, environment, contractual issues, and the absence of professional consultant managers.¹⁰

Project delays are sure to cause a lot of harm to the project owner and service provider. Because of this, Obrien (1996) concluded the losses caused by delays are :¹¹

1. For owners, delays cause loss of income from buildings that could have been exploited.
2. For contractors, delays mean rising overhead. As a result of the increase in material prices due to labor costs, and obstructed other projects.
3. For consultants, delays result in time losses which hinder other project activities.

The project delay factor that will be examined in this study is the implementation of a 24-storey apartment construction project with 5 parking floors and 19 residential floors which are carried out by SAP Contractor PT. Adhi Persada Gedung, 8 Architectural and Electrical Direct Contractor & Mechanical and Electrical Direct Contractor. Job location on Jl. Margonda Depok with 1000 units of studio type rooms and one bed room.

3. Research Methodology

In this study using survey methods to answer research questions that have been prepared previously. Questionnaires derived from variables that have been identified and verified by experts are research instruments, formulated based on variables that are broken down into indicators and subsequently transformed into questions. This survey method was conducted to identify the dominant factors that cause claims that affect performance in the Grand Taman Melati 2 Margonda Depok apartment construction project based on a questionnaire filled out by respondents.

Research variables are then formulated to describe and look for relationships between research variables, which are related or influence each other. The relationship between research variables as a causal relationship where there are variables that influence and variables that are affected. The variables in this study are interrelated and interact with the project delay factors based on (1) the owner (2) the planner; (3) MK; and (4) contractors.

The researcher summarizes the identification of these activities as can be seen in the table, namely the group of project delay factors and their activity variables based on various supporting references including those from project processed data.

¹⁰ Assaf, A. 1995. "Causes of Delay in Large Building Construction Projects", Journal of Management in Engineering

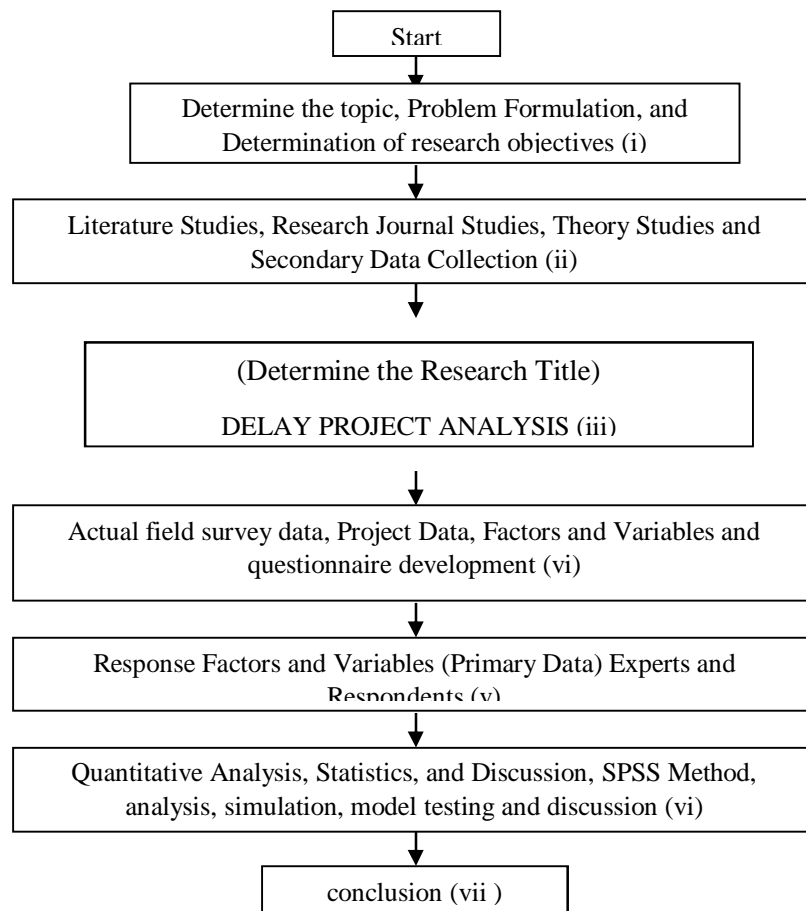
¹¹ Obrien, 1996. *CPM In Construction Management*. Boston: Cahner Book International Inc

Table 1. factor in variables research

No	Factor		Variable
1	<i>owner</i>	X1	The existence of land that has not been fixed from the owner associated with other agencies.
2		X2	Design Changes by the Owner.
3		X3	Delays in approval of drawings by the owner.
4		X4	Coordination with MK Consultants in the Checklist process is not good.
5		X5	Specification changes by Owner.
6		X6	Delay in specification approval by owner.
7		X7	The duration of the negotiation process for new work items that affects delays.
8		X8	Late payment affecting cash flow of work.
9		X9	The IMB process is causing delays
10	planning consultant	X10	The DED of the consultant planner are unclear
11	MK	X11	Late examination and approval of drawings by the Constitutional Court Consultant.
12		X12	Late examination and material approval by the Constitutional Court Consultant.
13		X13	lack of supervision from MK consultants.
14		X14	Coordination with MK Consultants in the Checklist process is not good.
15	contractor	X15	Delays from contractors in submitting Shopdrawing.
16		X16	Delays from contractors in submitting approval of material specifications.
17		X17	The length of the process of procurment of new work in an internal contractor.
18		X18	The quality of work is not good so it needs improvement.
19		X19	Coordinate work with other waiting jobs.
20		X20	Material that is not good when on site in the field.
21		X21	Workers who are less experienced in the field.
22		X22	Damage to the stock of materials contained in the field.
23		X23	Material delivery delays.
24		X24	Incomplete tool.
25		X25	Workers limitations.
26		X26	Poor contractor management.
27		X27	Material limitations.
28		X28	Incorrect selection of work methods.
29		X29	Payment process is not smooth.

No	Factor		Variable
30		X30	Poor work plan.
31		X31	The amount of repair work.
32	performance	Y	Delays in causing the performance of declining construction project

The systematic flow of research is shown in the following figure Figure 3. The systematic flow of research.



4. Discussion

Based on the results of a preliminary study, it is known that the Grand Taman Melati Margonda II Apartment project experienced a time delay in construction work. This causes risks and losses for the owner, consultant planners, MK and contractors.

From the results of tabulation of respondents' answers to the questionnaire distributed, the researcher can conduct data analysis to determine the relationship and influence of the independent variable (project delay) on the dependent variable (performance).

1. Validation & reliability test.

Based on the results of the validity test all variables in the assessment of each instrument have a corrected item-total correlation value more than r table, the research instrument is valid. Based on the Cronbach alpha value of the reliability test results is 0.746 means that the measurement instruments used in this study were declared reliable because $r = 0.756 > 0.7$ it can be concluded that the 32 valid variables are high reliability.

2. Correlation analysis.

Based on the results of the correlation test 31 independent variables that have been analyzed, it appears that all items of the variable have correlate with the performance variable (variable Y).

3. Regression Analysis.

Regression analysis is used to determine the effect of each independent variable (X) on the dependent variable (Y). The stages of this analysis consist of choosing the regression method, assuming the regression analysis requirements and the regression model test which includes the t test and the F test. Based on the regression analysis using the stepwise method, the regression model that was formed was 16 models consisting of variables. The forming variables of the XVI model are combined by variables X7, X22, X21, X14, X12, X23, X19, X24, X30, X17, X5, X6, X9 and X4. From the value of R^2 obtained from the forming variables of the model is 0.990.

Table 2 Regression of variable

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
16	Regression	5276.720	14	376.909	284.146	.000 ^a
	Residual	37.141	28	1.326		
	Total	5313.860	42			

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.	Collinearity Statistics	
		B	Std. Error				Tolerance	VIF
16	(Constant)	16,209	2,464		6,579	0,000		
	X7	4,350	0,384	0,284	11,321	0,000	0,396	2,526
	X22	2,259	0,472	0,110	4,788	0,000	0,473	2,115
	X21	3,355	0,345	0,217	9,727	0,000	0,500	1,998
	X14	1,020	0,382	0,072	2,673	0,012	0,344	2,910
	X12	1,839	0,345	0,108	5,329	0,000	0,609	1,642
	X23	1,655	0,293	0,119	5,641	0,000	0,561	1,781
	X19	2,489	0,340	0,173	7,316	0,000	0,446	2,240

ANOVA^a

Model	Sum of Squares		df	Mean Square	F	Sig.		
X24	1,794	0,399	0,094	4,490	0,000	0,564	1,773	
X30	1,667	0,585	0,082	2,852	0,008	0,304	3,284	
X17	1,795	0,322	0,106	5,581	0,000	0,695	1,439	
X5	1,207	0,335	0,084	3,603	0,001	0,456	2,192	
X6	1,233	0,346	0,065	3,563	0,001	0,758	1,319	
X9	1,715	0,503	0,084	3,409	0,002	0,411	2,430	
X4	1,000	0,361	0,056	2,773	0,010	0,610	1,639	
a. Dependent Variable: Y								
Model Summaryq								

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin - Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
16	.996 ^p	.993	.990	1.15172	.002	7.687	1	28	.010	1.954

p. Predictors: (Constant), X7, X22, X21, X14, X12, X23, X19, X24, X30, X17, X5, X6, X9, X4

q. Dependent Variable: Y

1. By using a significance level of 95%, $\alpha = 5\%$, $df_1 = k - 1 = 4 - 1 = 3$, $df_2 = 43 - 4 = 39$, n is the number of respondents and k is the number of variables, the results obtained for the F table are 2.85. based on the results of a comparison between the values of f with F table, $284,146 > 2.85$. The calculated F value is greater than the F table, the hypothesis H_0 is rejected and H_a is accepted, which means that simultaneously or simultaneously the independent variable influences the dependent variable. thus the researcher can conclude that the time delay analysis can affect construction performance.

2. The resulting multiple linear regression equation is :

$$Y = 16,209 + 4,35X7 + 2,259X22 + 3,355X21 + 1,02X14 + 1,839X12 + 1,655X23 + 2,489X19 + 1,794X24 + 1,667X30 + 1,795X17 + 1,207X5 + 1,233X6 + 1,715X9 + 1X4$$

3. Significance test of the hypothesis is determined through the t test with the following test criteria: Reject H_0 if t value > value of t table. Accept H_0 if t value < t table If H_0 is accepted, this means that the effect of the independent variable partially on the dependent variable is considered insignificant. H_0 rejection shows the significant effect of partially independent variables on a dependent variable.

5. Conclusion and Recommendation

Project delays are the completion of work on the field that is not timely, not according to the schedule offered by the implementing contractor. This is a decreasing performance of the implementing contractor. From the results of the study it can be concluded that the project delay factor can be divided into four views of those directly involved with the project namely: the owner, planner, MK and contractor.

Recommendations for improvement in order to avoid delays in this work are the need for procedural standards, coordination between the owner, the Constitutional Court and the contractor in the work and the speed of time in negotiating new work between the owner and the implementing contractor that has been reviewed in this study.

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