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Project Performance Improvement Through Project Maturity Level, Planning, Implementation, Monitoring and Controlling

(Case study at PT. XYZ)

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Abstract:- Project is an activity that produces a unique deliverable that is bound by certain constraints in terms of cost, time and scope. This research was conducted at a company in Indonesia that is engaged in EPC (Engineering, Procurement & Construction) where the products produced are pharmaceutical, cosmetic and food industrial equipment through the process of project management stages.

In its implementation, there are project completion times that are not according to the specified schedule and financing that exceeds the initial plan. This study aims to determine the effect of project maturity level on project planning, project implementation, project monitoring and control, and to determine the effect of project planning, project implementation, project monitoring and control on project performance in industrial machinery manufacturing projects, both pharmaceutical, cosmetic and food.

The research data was collected through a questionnaire involving 100 respondents, namely employees of PT. XYZ with 23 questions. Data analysis in this study used the PLS-SEM approach. The results of this study show that the project maturity level has a positive and significant influence on project planning, project implementation, project monitoring and control. Project planning, project implementation, project monitoring and control factors have a positive and significant impact on project performance. Project maturity level has a positive and significant indirect influence on project performance.

Keywords:- *Project Performance, Project Maturity Level, Project Planning, Project Implementation, Project Monitoring And Control, PLS-SEM.*

I. INTRODUCTION

A. Identification of problems

List of projects implemented at PT. XYZ in 2020 – 2022. The author tries to group several projects of comparable size with comparable levels of risk and difficulty. Then obtained several projects that will be analyzed. Quantitatively the project performance is the Key Performance Indicator (KPI) in PT. XYZ stands for Cost Performance and Schedule Performance.

Fig. 1 Summary project performance (budget performance) PT. XYZ implemented on 2020-2022
Source : Project Closing and Lesson Learn Data Repository PT. XYZ, data processed 2022

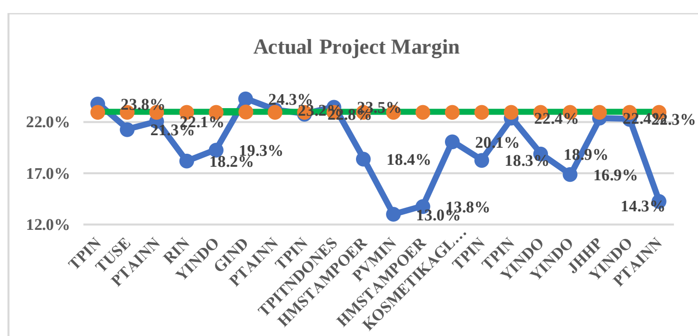

Fig. 2 Project performance (budget performance) PT. XYZ implemented on 2020-2022
Source : Project Closing and Lesson Learn Data Repository PT. XYZ, data processed 2022

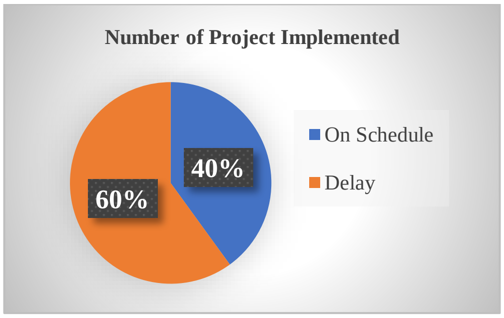

Fig. 3 Summary project performance (Schedule performance) PT. XYZ implemented on 2020-2022
Source : Project Closing and Lesson Learn Data Repository PT. XYZ, data processed 2022

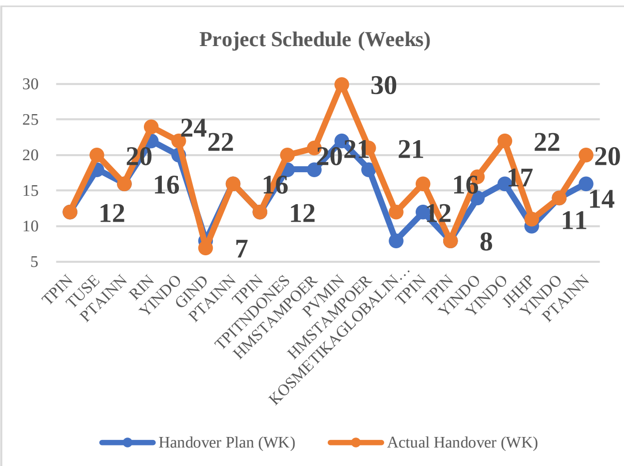

Fig. 4 Project performance (Schedule performance) PT. XYZ implemented on 2020-2022
Source : Project Closing and Lesson Learn Data Repository PT. XYZ, data processed 2022

Project Parameters	Value
Number of Project	**20**
Number Project of Delay	12
Number Project of On Schedule	8
Number Project of Over Budget	11
Number Project of On Budget	9
Total Project Value (IDR)	**39,845,519,612**
Plan Margin (IDR)	**9,164,469,511**
Actual Margin (IDR)	**7,335,230,155**
Total loses (%)	**20.0%**
Overall project Duration (Wks)	298
Actual project Duration (Wks)	341
Total % delay from Plan	**14.4%**

Table. 1 Overall project performance PT. XYZ implemented on 2020-2022
Source : Project Closing and Lesson Learn Data Repository PT. XYZ, data processed 2022

With the finding that over budget and project delays are quite significant for one reason or another, it is interesting for the author to carry out this research. Regardless of the complexity of a project and the magnitude of the project value, a project is unique with all the stakeholder relationships and interactions in it.

B. Research purposes

Based on the results of the formulation of the problem presented above, the objectives of this study are as follows:

- Knowing the influence and magnitude of the project maturity level parameters on the planning of a project in the implementation process at PT. XYZ.
- Knowing the influence and magnitude of the project maturity level parameters on project implementation in the implementation process at PT. XYZ.
- Knowing the influence and magnitude of the project maturity level parameters on the monitoring and control of a project in the implementation process at PT. XYZ.
- Knowing the influence and magnitude of project planning parameters on project performance in terms of financial parameters, project schedule, quality suitability and customer satisfaction with project implementation at PT. XYZ.
- Knowing the influence and magnitude of project implementation parameters on project performance in terms of financial parameters, project schedule, quality suitability and customer satisfaction with project implementation at PT. XYZ.
- Knowing the influence and magnitude of project monitoring and control parameters on project performance in terms of financial parameters, project schedule, quality suitability and customer satisfaction with project implementation at PT. XYZ

II. LITERATURE REVIEW

A. Project Management

Some of the terminology that is widely used by practitioners, among others, is a project is a unique activity in order to produce a product, both goods and services to meet the needs of related parties which are limited by resources and time. As stated by the Project Management Institute, Project Management Professional Body of Knowledge (PMBOK) Ed. 6th, 2017. While project management is a project management activity that includes planning, Implementing, organizing, controlling and monitoring as well as project completion or closure.

B. Smart Pls

This research uses data analysis method using SmartPLS software which is run with computer media. Ghozali (2006) explains that Partial Least Square (PLS) is an analytical method that is soft modeling because it does not assume the data must be with a certain scale measurement, which means the number of samples can be small (under 100 samples). The advantages of PLS analysis techniques according to Jogiyanto and Abdillah (2009) are:

- Able to model many dependent and independent variables (complex models).
- Able to manage multicollinearity problems between independent variables.
- The results remained solid even though there were abnormal data.
- Generate independent latent variables directly based on cross product which involves the dependent latent variable as predictive power.
- Can be used on small samples (under 100) and does not require data to be normally distributed.

III. METHOD

In this study, researchers will look for the effect and magnitude of the project maturity level, project planning, project implementation, project monitoring and control, on project performance which is measured based on project financial performance and project time performance, deliverable quality conformity performance, customer satisfaction performance, improvement the company's income and increase the company's reputation then describe the results of the study. The stages of the research are as described in the chart below:

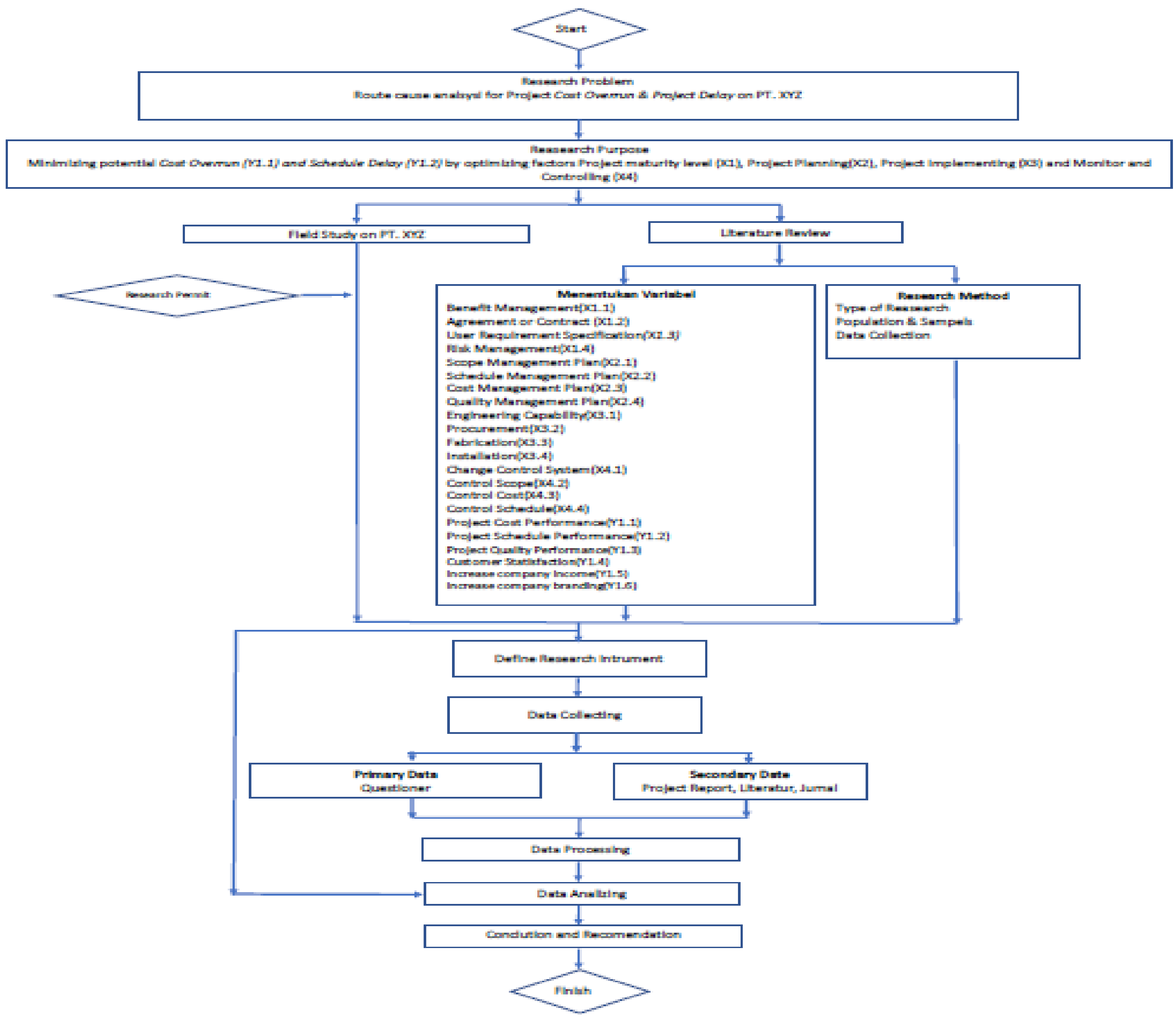

Fig. 5 Research Planning
Source : Data processed 2022

After the entire research flow has been determined, it will continue in the data processing process using the SmartPLS Application Version 3.0 to get the results of algorithm analysis (algorithm) from the data from the questionnaire. The following is a flowchart of how to perform data processing using smartPLS to find out the value of outer loading and inner loading. If the entire PLS algorithm analysis process has been completed, then it will proceed to the processing process using bootstrapping. The following is a flowchart of how to perform data processing using smartPLS to perform a Hypothesis Test by looking at the T Statistics value obtained from the smartPLS application. According to Sugiyono (2014) the operational definition is the determination of the construct or trait to be studied so that it becomes a variable that can be measured.

According to the relationship between one variable and another, variables can be further classified into two categories:

- Independent variable (independent variable, because it affects) The independent variables in this study are: project maturity level (X1), project planning (X2), project implementation (X3), project monitoring and control (X4)

- Dependent variable (dependent variable)

Project performance (Y1) which is measured based on project financial performance (Y1.1), project time performance (Y1.2) deliverable quality conformity performance (Y1.3), customer satisfaction performance (Y1.4), increasing company revenue (Y1 .5) and improve company reputation (Y1.6)

The following is a description and explanation of each research variable and its indicators:

- Project performance (Y1) is measured using project financial performance (Y1.1), project time performance (Y1.2), deliverable quality conformity performance (Y1.3), customer satisfaction performance (Y1.4), increasing company revenue (Y1. 5) and improving the company's reputation (Y1.6).

Project performance (Y1) is the dependent variable (the dependent variable) in this study which is influenced or as a result of the independent variable. Time, cost and quality are the dominant dimensions of performance evaluation (Omran, et al., 2012).

The dimensions of project performance are as follows.

- Cost Accuracy (Y1.1) is an indicator that becomes a benchmark for project performance as measured by the accuracy of the project's operational costs in accordance with the budget plan.
- Timeliness (Y1.2) is an indicator that becomes a benchmark for project performance as measured by the timeliness of the implementation process in accordance with the planned time estimate.
- The suitability of the quality of the output (Y1.3) is one of the indicators that becomes a benchmark for project performance as measured by the quality conformity required at the beginning of the project or in the URS.
- Customer satisfaction (Y1.4) is an indicator that becomes a benchmark for project performance as measured by customer satisfaction on the performance of project implementation, communication and interaction between stakeholders.
- The increase in company income (Y1.5) is an indicator that becomes a benchmark for project performance as measured by the project's financial contribution to the company where the project profits will be distributed to the company.
- Improved company reputation (Y1.6) is an indicator that becomes a benchmark for project performance which is measured by increasing company reputation, company branding and company portfolio.

- Project Maturity Level (X1)

Project maturity level is a factor that contributes to the success of a project, the higher the project maturity level in the organization the higher the probability of success. The dimensions of this factor are as follows:

- Benefit Management (X1.1) is an indicator that becomes a benchmark for project maturity level variables. In it consider the following factors:
  - The profit value of the project to be targeted for the company.
  - Considering tangible and non-tangible benefits in implementing this project.
  - The socio-economic and environmental potential impacts of the project.
- Agreement or contract (X1.2) is an indicator that becomes the benchmark of project maturity level. An agreement or work contract is a very important point in carrying out a project because everything that has been agreed upon by both parties will be poured into this contract or agreement and become a common guide to avoid disputes.
- The User Requirement Specification (X1.3) is an indicator that becomes the benchmark for the project maturity level, which is specifically and measurable starting from the quality, specifications, quantity, grade that the user needs will be poured and formalized in this document called URS. Understanding and applying URS is an absolute necessity of running a project.
- Risk management (X1.4) is an indicator that becomes a benchmark for project maturity level where at a certain project maturity level a project has used risk base thinking and anticipates all potential risks that exist and optimizes all available opportunities to improve project performance success.

- Project planning (X2)

- Scope planning (X2.1) is an indicator that becomes the benchmark of project planning. The scope is the project limit in accordance with the work contract, this relates to the part that is the responsibility of the supplier and user. Deviation from this limit will be closely related to overrun cost & schedule delay.

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- Project schedule planning (X2.2) is an indicator that becomes a benchmark for project planning. Realistic, detailed and comprehensive project schedule planning results in a good level of reliability to minimize over-run costs & schedule delays.
- Project cost planning (X2.3) is an indicator that becomes a benchmark for project planning. Detailed and accurate cost planning results in a good level of reliability to minimize over-run costs
- Quality assurance planning (X2.4) is an indicator that becomes a benchmark for project planning where good quality planning will help ensure good project output quality.

• Project implementation (X3)

- Engineering capability (X3.1) is an indicator that becomes a benchmark for project implementation, where engineering capability is an important aspect in producing all designs which eventually become a project deliverable.
- Purchasing (X3.2) is an indicator that becomes a benchmark for project implementation, where purchasing is a continuing process from the outcome of an engineering design, survey results at PT. XYZ where the cost portion for purchasing a project can reach 50-60% of the total project cost.
- Manufacturing (X3.3) is an indicator that becomes a benchmark for project implementation, where the manufacturing process in accordance with SOPs and quality contributes to project performance.
- Installation (X3.4) is an indicator that becomes a benchmark for project implementation, where the installation phase is carried out outside the company workshop but is still the responsibility of the supplier while maintaining the quality and schedule provisions.

• Monitoring & Control (X4) is an indicator that becomes a benchmark for project implementation, where the manufacturing process according to SOPs and quality contributes to project performance.

- Change management system (X4.1) is an indicator that becomes a benchmark for project monitoring and control, where in this indicator all things that are recorded as changes and these changes affect costs, project schedules, quality and customer satisfaction must be arranged in such a way that not out of the base line that has been set.
- Scope control (X4.2) is an indicator that becomes a benchmark for project monitoring and control, where in this indicator the monitoring and control process is focused on the project scope. Changes in the scope that are not controlled will have an impact on costs, project schedules, quality and customer satisfaction.
- Cost Control (X4.3) is an indicator that becomes a benchmark for project monitoring and control, where in this indicator the monitoring and control process is focused on project financing. All costs incurred in the project must be in accordance with the costs that were planned at the beginning of the project, any deviation will be affected by costs, project schedule, quality and customer satisfaction must be arranged in such a way that it does not go out of the base line that has been set.
- Project schedule control (X4.4) is an indicator that becomes a benchmark for project monitoring and control, where in this indicator the monitoring and control process is focused on the project schedule. All activities that occur in the project must be in accordance with what was planned at the beginning of the project, there are other factors that are not planned which will cause changes in project time, will affect costs, project schedule, quality and customer satisfaction must be arranged in such a way that it does not come out from the base line

Below is a combination of relationships between variables and their dimensions where there are 4 X variables, namely project maturity level (X1), project planning (X2), project implementation (X3), project monitoring and control (X4) with one Y variable, namely project performance measured as financial/budget performance (Y1.1), project time performance (Y1.2), deliverable quality conformance performance (Y1.3), customer satisfaction performance (Y1.4), increasing company revenue (Y1.5) and improving company reputation (Y1.6) as described in the figure below.

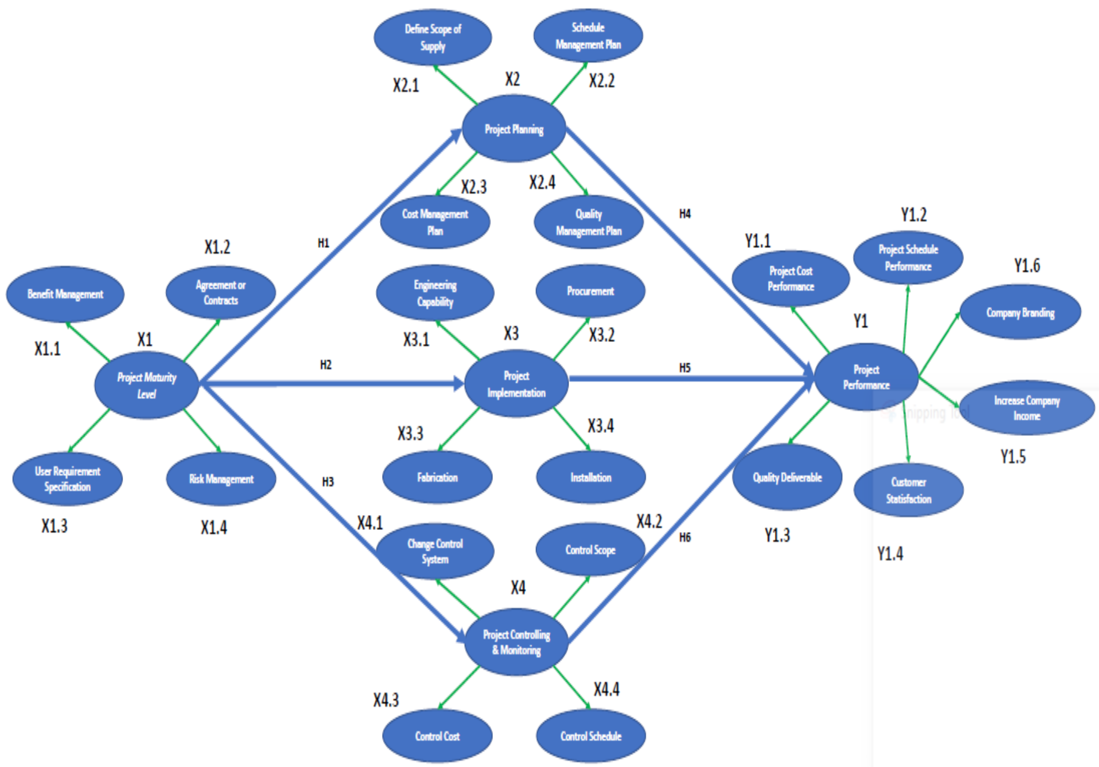

Fig. 6 Correlation between variables & dimensions
Source : Data processed 2022

PLS-SEM analysis consists of 2 sub models, namely: *outer model* and *inner* model. Outer *model* or *outer relations* or *measurement model* defines how each indicator block relates to its latent variable. This model specifies the relationship between latent variables and their indicators or it can be said that *outer model* defines the relationship of each indicator with its latent variable. According to Ghozali (2006). The equation of the measurement model for each variable can be seen in the following:

Variables	Indicator Portion	Measurement Modeling Equations
X1 Project Maturity Level	$\lambda K1.1$	$X1.1 = \lambda K1.1\ X1 + \delta 1$
	$\lambda K1.2$	$X1.2 = \lambda K1.2\ X1 + \delta 2$
	$\lambda K1.3$	$X1.3 = \lambda K1.3\ X1 + \delta 3$
	$\lambda K1.4$	$X1.4 = \lambda K1.4\ X1 + \delta 4$
X2 Project Planning	$\lambda PER2.1$	$X2.1 = \lambda PER2.1\ X2$
	$\lambda PER2.2$	$X2.2 = \lambda PER2.2\ X2$
	$\lambda PER2.3$	$X2.3 = \lambda PER2.3\ X2$
	$\lambda PER2.4$	$X2.4 = \lambda PER2.4\ X2$
	$\lambda PEL3.1$	$X3.1 = \lambda PEL3.1 X3 +$
	$\lambda PEL3.2$	$X3.2 = \lambda PEL3.2\ X3 +$
X3 Project Implementing	$\lambda PEL3.3$	$X3.3 = \lambda PEL3.3\ X3 +$
	$\lambda PEL3.4$	$X3.4 = \lambda PEL3.4\ X3 +$
X4 Project Monitoring & Controlling	$\lambda PP4.1$	$X4.1 = \lambda PP4.1\ X4 +$
	$\lambda PP4.2$	$X4.2 = \lambda PP4.2\ X4 +$
	$\lambda PP4.3$	$X4.3 = \lambda PP4.3\ X4 +$
	$\lambda PP4.4$	$X4.4 = \lambda PP4.4\ X4 + \delta 16$
Y1 Project performance	$\lambda KP1.1$	$Y1.1 = \lambda KP1.1\ Y1 +$
	$\lambda KP1.2$	$Y1.2 = \lambda KP1.2\ Y1 +$
	$\lambda KP1.3$	$Y1.3 = \lambda KP1.3\ Y1 +$
	$\lambda KP1.4$	$Y1.4 = \lambda KP1.4\ Y1 +$
	$\lambda KP1.5$	$Y1.5 = \lambda KP1.5\ Y1 +$
	$\lambda KP1.6$	$Y1.6 = \lambda KP1.6\ Y1 +$

Table. 2 Equation models for variable measurement
Source : Data processed 2022

IV. RESULT

In this study, the number of respondents was 100 respondents with the demographics as stated above, each respondent was required to answer 23 questions using a Linkert scale of 1 to 5 with a summary as follows:

No	Questions	Very Disaggred	Disaggred	Neutral	Agrred	Very Aggred
		1	2	3	4	5
1	Question 1	3%	0%	36%	50%	11%
2	Question 2	5%	0%	37%	45%	13%
3	Question 3	4%	0%	37%	49%	10%
4	Question 4	7%	0%	40%	44%	9%
5	Question 5	6%	0%	43%	40%	11%
6	Question 6	7%	0%	37%	47%	9%
7	Question 7	4%	0%	44%	41%	11%
8	Question 8	8%	0%	36%	44%	12%
9	Question 9	7%	0%	32%	53%	8%
10	Question 10	8%	0%	36%	47%	9%
11	Question 11	3%	0%	36%	44%	17%
12	Question 12	3%	0%	37%	43%	17%
13	Question 13	7%	0%	35%	45%	13%
14	Question 14	4%	0%	32%	47%	17%
15	Question 15	5%	0%	33%	53%	9%
16	Question 16	7%	0%	34%	42%	17%
17	Question 17	6%	36%	34%	12%	12%
18	Question 18	3%	33%	44%	16%	4%
19	Question 19	1%	23%	40%	25%	11%
20	Question 20	3%	25%	40%	23%	9%
21	Question 21	12%	34%	35%	12%	7%
22	Question 22	14%	38%	30%	11%	7%
23	Question 23	15%	27%	37%	11%	10%

Table. 3 Questinary answer result
Source : Data processed 2022

After all the questionnaire data is processed and results are obtained as in table 3 above, then a descriptive analysis of the variables used to describe in general terms the data obtained from the questionnaire results, so that the true meaning and circumstances can be known while the respondents are involved in an implementation project at PT XYZ.

Variables	Indicators	Mean
Project Maturity Level (X1)	X1.1	3.66
	X1.2	3.61
	X1.3	3.61
	X1.4	3.48
Project Planning (X2)	X2.1	3.50
	X2.2	3.51
	X2.3	3.55
	X2.4	3.52
Project Implementing (X3)	X3.1	3.55
	X3.2	3.49
	X3.3	3.72
	X3.4	3.71
Project Monitoring & Controlling (X4)	X4.1	3.57
	X4.2	3.73
	X4.3	3.61
	X4.4	3.62
Project Performance (Y1)	Y1.1	2.88
	Y1.2	2.85
	Y1.3	3.22
	Y1.4	3.10
	Y1.5	2.68
	Y1.6	2.59
	Y1.7	2.74

Table. 4 Statistic Descriptive of Research variables
Source : Data processed 2022

A. *Descriptive Statistics of Research Variables*

Project maturity level (X1) variable on indicatorfrequent management benefits (X1.1) obtained data that respondents strongly agree 11% (11 respondents), agree 50% (50 respondents), neutral 36% (36 respondents), disagree 0% (0 respondents) and strongly disagree 3% (3 respondents) and statistically has the largest mean value among other indicators, namely 3.66 which means thatimproper management benefits occurhave a major effect on project performance.

Planning variable (X2) on indicatorproper cost planning that often occurs (X2.3) obtained data on respondents strongly agree 11% (11 respondents), agree as much as 50% (50 respondents), neutral 36% (36 respondents), disagree 0% (0 respondents) and strongly disagree 3% (3 respondents) and statistically has the largest mean value among other indicators, namely 3.55 which means thatImproper cost planning occurshave a big effect on project performance.

While the purchasing indicator (X3.2) obtained data strongly agree as much as 11% (11 respondents), agree 41% (41 respondents), Neutral 44% (44 respondents), and disagree 4% (4 respondents). If seen statistically in table 4.2 the project scope indicator (X2.1) obtained the smallest mean value of 3.50, this indicates that the project management techniques and applications (tools) in the project are quite influential on project performance.

Based on the results of the variable description, it shows that the Project maturity level (X1) variable on the management benefit indicator(X1.2) obtained data from respondents strongly agreeing 11% (11 respondents), agreeing as much as 50% (50 respondents) and neutral 36% (36 respondents) and statistically having the largest mean value among other indicators, namely 3.66 which means that the benefits Proper management of facilities and sufficient all factors is one of the important things in Project Maturity in a project implementation.

While the results of the variable description show that the project planning variable (X2) on the management benefit indicator(X1.2) obtained data from respondents strongly agreeing 11% (11 respondents), agreeing as much as 50% (50 respondents) and neutral 36% (36 respondents) and statistically having the largest mean value among other indicators, namely 3.66 which means that the benefits Proper management of facilities and sufficient all factors is one of the important things in Project Maturity in a project implementation.

B. PLS-SEM Analisis Analysis

The outer model test aims to see the value of the validity and reliability of a model. The measurement validity test consists of convergent validity and discriminant validity.

- *Convergent Validity (Convergent Validity)*

Convergent Validity is measuring the validity of reflexive indicators as a measure of variables that can be seen from the outer loading of each variable indicator. An indicator is said to have good reliability, if the outer loading value is above 0.70 (Ghozali & Latan, 2015). The following is the result of the correlation between the indicator and its construct showing the value of outer loading > 0.7. The value of outer loading in the model can be seen:

Indicators	**X1 Project Maturity Level**	**X2 Project Planning**	**X3 Project Executing**	**X4 Project monitoring & Controlling**	**Y1 Project Peformance**
X1.1	0.74				
X1.2	0.75				
X1.3	0.75				
X1.4	0.81				
X2.1		0.83			
X2.2		0.84			
X2.3		0.71			
X2.4		0.71			
X3.1			0.77		
X3.2			0.75		
X3.3			0.74		
X3.4			0.73		
X4.1				0.87	
X4.2				0.76	
X4.3				0.76	
X4.4				0.78	
Y1.1					0.82
Y1.2					0.79
Y1.3					0.85
Y1.4					0.84
Y1.5					0.81
Y1.6					0.83
Y1.7					0.85

Table. 5 Outer Loading Validation
Source : Data processed 2022

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The merging of all SEM components into a complete model of the measurement model and structural model, depicted in a flow chart to make it easier to see the causality relationships to be tested can be seen in the figure*Path Diagram* based on the following Loading Factor

Fig. 7 Path diagram based on loading factor
Source : Data processed 2022

- Discriminant validity

Discriminant validity is to compare the value of the square root of average variance extracted (AVE) of each construct with the correlation between other constructs in the model, if the square root of average variance extracted (AVE) of the construct is greater than the correlation with all other constructs, it is said to have good discriminant validity. It is better that the AVE measurement value should be greater than 0.50 (Ghozali & Latan, 2015). In addition to the AVE measurement to test the discriminant validity measurement model, it is also done by looking at the cross loading value. A measurement is categorized as having discriminant validity if it has a cross loading value of 0.7 (Jogiyanto, 2009). The value of cross loading in the model can be seen in the following.

Indicators	**Cross Loading**				
	X1 Project Maturity Level	**X2 Project Planning**	**X3 Project Implementing**	**X4 Project Monitoring & Controlling**	**Y1 Project Performance**
X1.1	0.74	0.47	0.44	0.58	0.53
X1.2	0.74	0.54	0.55	0.68	0.55
X1.3	0.75	0.57	0.56	0.56	0.55
X1.4	0.81	0.66	0.55	0.57	0.58
X2.1	0.66	0.83	0.67	0.62	0.62
X2.2	0.61	0.84	0.65	0.61	0.63
X2.3	0.36	0.71	0.51	0.51	0.60
X2.4	0.63	0.71	0.57	0.60	0.57
X3.1	0.55	0.59	0.77	0.51	0.55
X3.2	0.58	0.69	0.75	0.63	0.56
X3.3	0.56	0.56	0.74	0.54	0.62
X3.4	0.37	0.49	0.73	0.32	0.61
X4.1	0.73	0.60	0.54	0.87	0.56
X4.2	0.63	0,70	0.55	0.76	0.63
X4.3	0.54	0.47	0.43	0.76	0.50
X4.4	0.56	0.63	0.61	0.78	0.59
Y1.1	0.55	0,60	0.65	0.65	0.82
Y1.2	0.61	0.66	0.63	0.63	0.79
Y1.3	0.61	0.64	0.63	0.62	0.85
Y1.4	0.59	0.67	0.63	0.60	0.84
Y1.5	0.58	0.65	0.69	0.55	0.81
Y1.6	0.59	0.67	0.66	0.55	0.83
Y1.7	0.67	0.64	0.65	0.59	0.85

Table. 6 Cross Loading Value
Source : Data processed 2022

Based on the table above, it can be seen that the cross loading value in bold has the highest value in the variables it forms compared to the values in other variables with a cross loading value > 0.7 which ranges from 0.71 to 0.87. So it can be concluded that all indicators have met the criteria and can be said to be good for further analysis. In addition to observing the value of cross loading, discriminant validity can also be known through other methods, namely by looking at the average variant extracted (AVE) value for each indicator, it is required that the value must be > 0.5 for a good model. The AVE value in the model can be seen in the table below.

Variables	AVE
X1 : Project Maturity Level	0.58
X2 : Project Planning	0.60
X3 : Project Implementing	0.56
X4 : Project Monitoring & Controlling	0.63
Y1 : Project Performance	0.69

Table 7. Average Variance Extracted (AVE) Value
Source : Data processed 2022

In the table it can be seen that all indicators used for variables are declared valid because the AVE value is above 0.5. Based on the data presented in table 7 above, it is known that the AVE value of the Project maturity level variable, project planning, project implementation, project monitoring and control and project performance greater than 0.5. Thus it can be stated that each variable has good discriminant validity.

Discriminant validity test can also be done by looking at the value of the Fornell-Larcker criteria and the value of cross loading. According to the Fornell-Larcker criteria, the square root of the AVE value of each construct must be higher than the correlation value between constructs in a model. According to Sarwono (2007) Fornell-Larcker criteria are used to ensure discriminant validity, then the AVE for each latent variable must be higher than R2 with all other latent variables. Thus, each latent variable shares more variance with each of its indicator blocks than with other latent variables representing a different block of indicators. The results of the Fornell-Larcker criteria can be seen in the following table:

Variable	**Fornell-larcker Criteria**				
	X1 Project Maturity Level	**X2 Project Planning**	**X3 Project Implementing**	**X4 Project Monitoring & Controlling**	**Y1 Project Performance**
X1 : Project Maturity Level	0.76				
X2 : Project Planning	0.74	0.77			
X3 : Project Implementing	0.69	0.78	0.75		
X4 : Monitoring & Controlling	0.78	0.76	0.68	0.79	
Y1 : Project Performnace	0.73	0.78	0.78	0.72	0.83

Table 8 : Fornell-larcker Criteria value
Source : Data processed 2022

Based on Table 8. it can be shown that the square root value of AVE is higher than the correlation value between latent variables.

- Reliability Test (Composite Realibility)

Composite Reliability is the part that is used to test the reliability value of indicators on a variable. A latent variable can be said to have good reliability if the composite reliability value is greater than 0.7 (Sarwono & Narimawati 2015). The Rule of Thumb is usually used to assess construct reliability, namely the composite reliability value must be more than 0.7. Composite reliability shows a degree that indicates common latent (unobserved), so it can show a block indicator that measures the internal consistency of the constructor-forming indicators, the accepted limit value for the Composite reliability level is 0.7 although it is not an absolute standard (Ghozali & Latan, 2015). Composite Realibility values in the model can be seen:

Variables	Composite Reliability
X1 : Project Maturity Level	0.84
X2 : Project Planning	0.86
X3 : Project Implementing	0.84
X4 : Monitoring & Controlling	0.87
Y1 : Project Performnace	0.94

Table 9. *Composite Reliability Value*
Source : Data processed 2022

Based on the data presented in table 9 above, it shows that all the variables used in this study, including project maturity, project planning, project implementation, monitoring & controlling projects and project performance has a composite reliability value above 0.7. The composite reliability value of Project Maturity is 0.84, project planning is 0.86, Project implementation is 0.84, Project Monitoring & Control is 0.87 and Project Performance is 0.94. From this statement, it can be stated that each indicator of each variable is declared reliable, accurate, consistent, and appropriate for measuring variables.

- Reliability Test *Cronbach's alpha*

The reliability test with composite reliability in table 4.7 above can be strengthened by using the Cronbach alpha value. A variable can be declared reliable or fulfills cronbach alpha if it has a cronbach alpha value > 0.7 (Sarwono & Narimawati 2015). Cronbach's alpha value in the model can be seen in table 9 below.

Based on the data presented above in table 4.9, it can be seen that the Cronbach's alpha value of each research variable is > 0.7. Thus, these results can indicate that each research variable has met the requirements of Cronbach's alpha value, so it can be concluded from this statement that it can be stated that each indicator of each variable is declared reliable, accurate, consistent, and appropriate for measuring variables.

Variables	Cronbach's alpha
X1 : Project Maturity Level	0,75
X2 : Project Planning	0.77
X3 : Project Implementing	0.74
X4 : Monitoring & Controlling	0.80
Y1 : Project Performnace	0.92

Tabel 10. *Cronbach's alpha value*
Source : Data processed 2022

- Inner Model Evaluation

Evaluation of the inner model or structural model test to see the direct and indirect effects between variables. In this study, the results of the path coefficient test, goodness of fit test and hypothesis testing will be explained.

-Coefficient of Determination (R2) and Goodness Of Fit (Q2)

Evaluation of the Coefficient of Determination (R2) is used to show how much effect or influence the independent variable has on the dependent variable. Chin said the results of R2 of 0.67 and above for endogenous latent variables in the structural model indicate the effect of exogenous variables (which affect) on endogenous variables (which are influenced) is included in the good category. Meanwhile, if the result is 0.33 – 0.67 then it is included in the medium category, and if the result is 0.19 – 0.33 then it is included in the weak category (Ghozali, 2005). The R-Square value in the model can be seen in table below.

VariabLES	R Square
X1 : Project Maturity Level	0
X2 : Project Planning	0.55
X3 : Project Implementing	0.48
X4 : Monitoring & Controlling	0.61
Y1 : Project Performnace	**0.71**

Table 11. *R-Square Value*
Source : Data processed 2022

Based on the table above, it can be seen that the Planning response variable (X2) obtained an R-Square value of 0.55. This explains that the large percentage of the predictor variable, namely Project maturity level (X1) can explain Project Planning (X2) by 55%. While the remaining 45% (100% - 55% = 45%) is influenced by other factors outside the research model between Project Maturity and Project Planning. In the Project Implementation response variable (X3), the R-Square value is 0.48. This explains that the large percentage of the predictor variable, namely Project maturity level (X1) can explain Project Implementation (X3) by 48%. While the remaining 52% (100% - 48% = 52%) is influenced by other factors outside the research model between Project Maturity and Project Implementation. On the response variable Monitoring & Project Control (X4) obtained an R-Square value of 0.61. This explains that the large percentage of the predictor variable, namely Project maturity level (X1) can explain Project Monitoring & Control (X4) by 61%. While the rest, which is 39% (100% - 61% = 39%) is influenced by other factors outside the research model between Project Maturity and Project Monitoring & Control.

In the project performance response variable (Y), the R-Square value is 0.71. This explains that the percentage of predictor variables, namely Project Planning (X2), Project Implementation (X3), and Project Monitoring & Control (X4) can simultaneously explain Project Performance (Y) of 69.2%. While the remaining 29% (100% - 71% = 29%) is influenced by other factors outside the research model between Project Planning, Project Implementation, and Project Monitoring & Control on Project Performance.

In the goodness of fit assessment, it can be known through the value of Q2. The value of Q2 has the same meaning as the coefficient of determination (R-Square) in regression analysis, where the higher the R-Square, the more fit the model can be with the data. Calculation of the value of Q2 as follows (Hair et al., 2011):

$Q2 \quad = 1 - (1 - R12)$
Q2 = 1 - (1-0.71)
= 1 – (0.29)
= 1 – 0.29
= 0.71

The result of the calculation is that the Q2 value is 0.71, which means that the diversity of the research data can be explained by the structural model developed in this study, which is 71%. Based on these results, the structural model in this study has a good goodness of fit. GoF values range from 0 to 1 with the interpretation of values: 0.1 (small GoF), 0.25 (moderate GoF), and 0.36 (large GoF) (Zali and Latan: 2012).

- Hypothesis testing

After the data meets the measurement requirements, it can be continued by performing the bootstrapping method on SmartPLS 3.2.8. The bootstrapping method is a new sampling procedure that is repeated as many as N new samples from the original data of size n, where for a new sample the sampling

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points are taken from the original data one by one up to n times with retrieval (Efron & Tibshirani, 1998). Whether or not a proposed hypothesis is accepted, it is necessary to test the hypothesis using the Bootstrapping function on SmartPLS 3.0. The hypothesis is accepted when the significance level is less than 0.05 or the t-value exceeds the critical value (Hair et al, 2014). The following is a path diagram of bootstrapping results using the smartPLS application based on the t-statistical coefficient (T value):

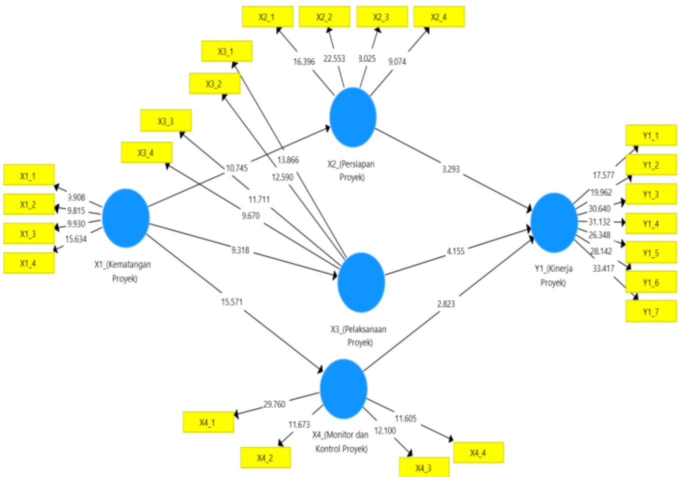

Fig. 8 Path diagram based on Boostrrapping
Source : Data processed 2022

Based on the data processing that has been done, the results can be used to answer the hypothesis in this study. Hypothesis testing in this study was carried out by looking at the T-Statistics value where the research hypothesis could be declared accepted if the T-Statistics value > T table.

Hypothesis:
H0 : There is no effect between the independent variables on the dependent variable partially
H1: There is an effect between the independent variable on the dependent variable partially
Decision Criteria:

- If the value of T-Statistics < T table (t(0.05, 62) = 1.999) then H0 is accepted.
- If the value of T-Statistics > T table (t(0.05, 62) = 1.999) then H1 is accepted.

Hypo	Path	Path Coefficient	T Statistics	Remark
H1	X1 : *Project Maturity Level* -> X2 : Project Planning	0.75	10.745	Positive influence and Significant
H2	X1 : *Project Maturity Level* -> X3 : Project Implementing	0.70	9.318	Positive influence and Significant
H3	X1 : *Project Maturity Level* -> X4 : Monitoring & controlling	0.79	15.571	Positive influence and Significant
H4	X2 : Project Planning > Y : Project Performance	0.31	3.293	Positive influence and Significant
H5	X3 : Project Implementing -> Y : Project Performance	0.39	4.155	Positive influence and Significant
H6	X4 : Monitoring & controlling -> Y1 : Project Performance	0.22	2.823	Positive influence and Significant

Table 12. Hypothesis validation result
Source : Data processed 2022

Table 12. above shows the path coefficient values for H1, H2, H3, H4, H5 and H6 which have path coefficient values of more than 0.1 and are positive, thus all hypotheses have an effect and are positive. Meanwhile, the significance value can be seen from the t-statistic value > 1.99 and p-value <0.05, based on the data above H1, H2, H3, H4, H5 and H6 have significant values.

Correlation between indicators is a form of correlation used to see the relationship between indicators, according to Sugiono (2017) the correlation is divided into five, namely very low correlation with a coefficient value between 0.00 – 0.199, low correlation with a coefficient value of 0.20 – 0.399, moderate correlation with a coefficient value of 0.40 – 0.599, a high correlation with a coefficient value of 0.60 – 0.799 and a very high correlation with a coefficient value of 0.80 – 1. Table 4.12 below is the correlation value between indicators obtained from the indicator correlation data on smartpls.

- Analysis of Indirect Effects (total indirect effect)

Based on the data processing that has been carried out using the SmartPLS application, it can also be seen that the indirect effect of the independent variable (Project Planning) on the dependent variable (Project Performance). By using the same hypothesis and decision criteria, the total indirect effect can be explained

Indirect Correlation	Path Koefficient	T Statistics	Remark
Project Maturity Level (X1) → Project Performance (Y)	0.68	6.441	Significant

Table 13. T*otal indirect effect value*
Source : Data processed 2022

Based on table 13 above, it is found that, indirectly, the effect of project planning on project performance is obtained by the path coefficient value of 0.68. It is also known, the value of T-Statistics (12.84) > T table (1.999) then the hypothesis H0 is rejected and H1 is accepted. This means that there is a significant positive indirect effect between *Project Maturity Level* on Project Performance. This explains that the higher *Project Maturity Level* the Project Performance will be higher or higher. And vice versa if the value of *Project Maturity Level* the lower the Project Performance will be lower or decreased.

V. CONCLUSION & RECOMMENDATION

A. *Conclusion*

Based on the results of research that has been done, it can be concluded as follows:

- Based on the results of the evaluation of the coefficient of determination, it is found that the Project Maturity level (X1) can explain Planning (X2) by 55%. Project Maturity has a positive and significant effect on planning by 75%. This explains that the higher the Project Maturity level value, the higher the planning value will be. Vice versa if the value of the Project Maturity level is lower, the planning will be lower or decreased.
- Based on the results of the evaluation of the coefficient of determination, it is found that the Project Maturity level (X1) can explain the implementation of the Project (X3) by 48%. Project Maturity level has a positive and significant effect on project implementation by 70%. This explains that the higher the Project Maturity level, the higher the project implementation will be. Vice versa if the value of Project Maturity is lower, the implementation of the project will be lower or decreased.
- Based on the results of the evaluation of the coefficient of determination, it is found that the Project Maturity level (X1) can explain the monitoring and control of the Project (X4) by 61%. Project Maturity has a positive and significant effect on project monitoring and control by 79%. This explains that the higher the Project Maturity value, the higher the project monitoring and control will be. Vice versa if the value of Project Maturity is lower, the monitoring and control of the project will be lower or decreased.
- Project planning has a positive and significant impact on project performance in terms of time, cost, quality and customer satisfaction by 31.0%. This explains that the higher the planning value, the higher the project performance or increase. On the other hand, if the planning value is lower, the project performance will be lower or decreased.
- Project implementation has a positive and significant impact on project performance in terms of time, cost, quality and customer satisfaction of 39.0%. This explains that the higher the project implementation value, the higher the project performance or increase. Vice versa, if the value of the project implementation is lower, the project performance will be lower or decreased.
- Monitoring and control have a positive and significant effect on project performance in terms of time, cost, quality and customer satisfaction by 22.0%. This explains that the higher the value of project monitoring and control, the higher the project performance or increase. Vice versa if the value of monitoring and controlling the project is lower, the project performance will be lower or decreased.

B. *Suggestion*

Based on the limitations in this study, the researchers suggest improvements for further research as follows:

- Need to go deeper for variables*Project Maturity level* related to risk management because at this time the company PT. XYZ has not implemented risk management in any of its projects.
- Future research is expected to develop this research or explore the effect of independent variables on project performance. This needs to be done considering the number of projects that are run in the Company and have different types of projects, so that it can be known whether the type or type of project has an influence on project performance. In addition to the type of project, user needs analysis variables can also be used, this needs to be done to find out whether user needs analysis variables significantly affect performance, considering that if the needs analysis is collected in full and in detail it can minimize changes in needs during the project.
- Further research uses a more complete conceptual model where a moderating effect can be added before project performance needs to be done for better results, it is recommended that further research be carried out on several companies that have similar businesses, so that the results of this study can be implemented in other companies.

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