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Analysis of Scheduling Effectiveness and Project Delay Factors in Project Q

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Abstract:- This research was conducted to get a better and more effective schedule in a project compared to the existing one that was made by combining all the time needed in each task and also to know the factors that caused the delay in project because of the project studied in this research was delayed for 11 days. The project itself is data transformation project. Which is an endeavor undertaken to adjust company's internal data with other companies or vendors for specific purpose. There will be sacrifices incurred by the company both in time and financial if the schedule takes too much time and if there's a delay in the project. For this reason, researcher wants to apply a scheduling method which is CPM to find out whether the scheduling is effective or not and to further explore what factors are causing delayed project which is happen to the case the researcher studied on. In this case, researcher using tools such as work breakdown structure and fishbone diagram to find the root cause of the problem and apply PDCA as an endeavor of improvement. The expected result is getting a better schedule and the main factors that cause delay so that it can be used to improve the effectiveness of next project.

Keywords:- *CPM, Project, Schedule, Delay, Fishbone.*

I. INTRODUCTION

Every company in the face of the times will always develop and try to achieve better targets than before by involving all the elements and components that play a role in the company. Of course, every component in the company has their respective strategies in achieving the vision of the company, especially the special section or division that plays a direct role with the information system because it is directly dealing with the advancement of information technology that is very fast developing.

To cope with this situation, companies usually teaming up with smaller companies or vendors to handle the situation. Complementing with the vendor is expected to meet the needs of the company, but in its implementation there is a similar problem that always arises for each vendor working together, namely adjusting company data with the data needed for consumption by the vendor, hereinafter referred to as data transformation. Existing data in the company is in accordance with the pattern of consumption of internal needs so that when using an outside vendor it takes a relatively longer time and often even exceeds the time agreed upon with the vendor.

Here are some projects related to vendors and their timeframe and realization of the process,

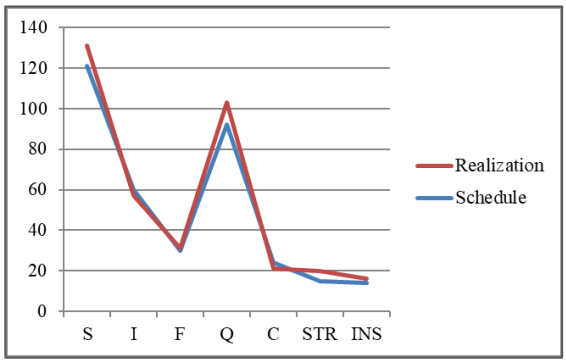

Fig 1:- Research Framework

This figure shows that most of the project samples taken exceeded the specified schedule. This is seen from top management as being less competent than the IT team itself apart from the role of other teams in addition to the effort and additional costs that need to be incurred due to extend over the allotted time. In addition, in the implementation of the process, there are many more detailed steps that should be regulated in such a way that the project work time is not necessary as long as it is now, where currently the schedule is determined linearly where the total working time is the total hours for each activity carried out in a project.

II. METHODS

A project can be interpreted as a temporary effort taken to create a unique product, service or outcome.[1] The research methodology used on to this project describes the procedures regarding the research steps that are arranged systematically. A systematic step is needed so that the research can be carried out properly and the planned research objectives can be achieved. This research refers to the background and is oriented towards the interests of the company and refers to the formulation of the problem.

Based on the type and design of the study, this study uses a quantitative approach (quantitative research). This study describes a process / event, phenomenon or event and certain analysis so that this research enters into a descriptive analytical type of research where the research

focuses on problems as they were when the research was conducted. This research studies certain aspects and objects in detail (in the form of case studies) related to the problem to be studied and provides a solution that allows to solve these problems, especially the problem of the effectiveness of the projects schedule.

In this study, first the researcher review and identify the scope of the project, describe, break down into activities or groups of activities that are components of the project. Secondary data in the form of project work data, the work process that will be identified and broken down into smaller components (work breakingdown structure), to get higher detail. The more detailed the activities, the more detailed the relationships with other activities.

Then rearranging the components in first step, to be an appropriate order of dependency logic based on a literature study. After that, provide estimates of the timeframe for each activity resulting from the calculation of worker productivity.

The last step is to find the Critical Path using CPM and using Fishbone to identify the root cause of the things that make the project delayed. Then finish it up with PDCA to ensure the improvement of the next project based on the result of Fishbone analysis.
[2]

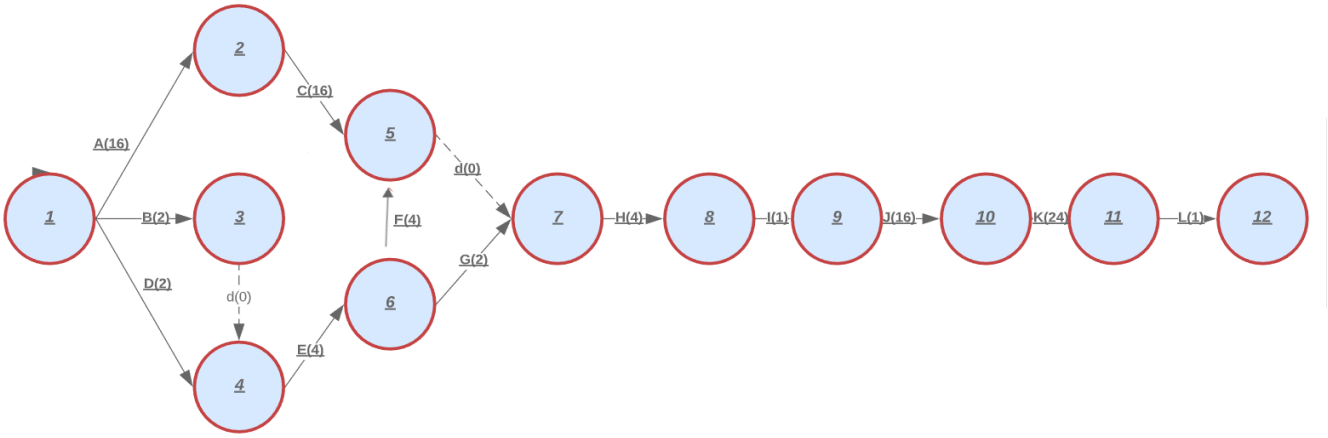

Fig 2:- CPM Method

Task	Predecessor	Duration (days)
A	-	16
B	-	2
C	A	16
D	-	2
E	B, D	4
F	E	4
G	E	2
H	C, F, G	4
I	H	1
J	I	16
K	I, J	24
L	K	1

Table 1:- Project Tasks

Figure 1 is made of table 1 to find the Critical path of the project. Where E (Earliest) and L

(Longest) tiime can be found then the critical path can be determined ie when the value of E = L or E - L = 0 (zero slack) for each of the same activity.[3]

And the result of the CPM algorithm is show in figure 2 below

III. RESULTS

The result of the CPM algorithm is shown in figure 2 below.

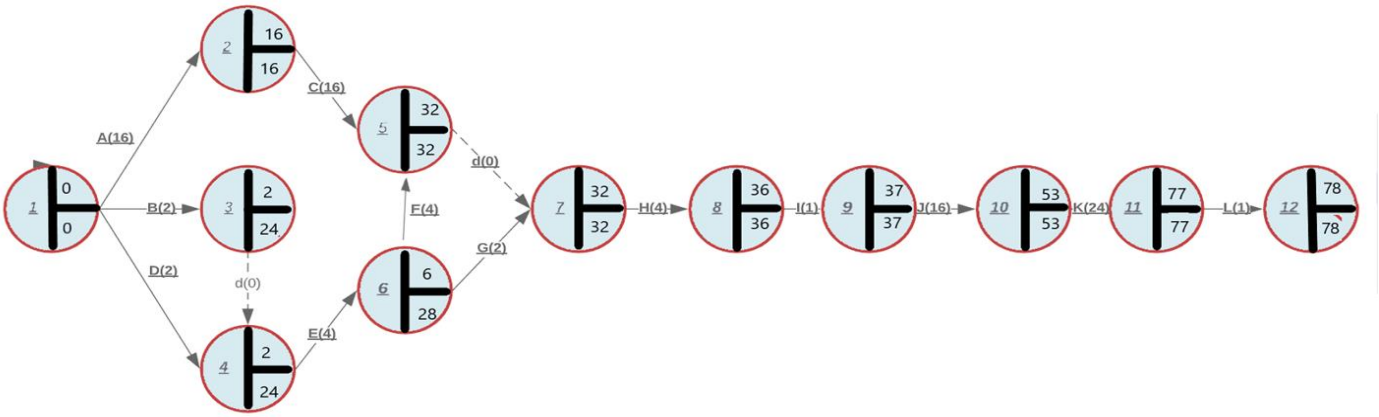

Fig 3:- Critical Path Result

The project activity pathway represented by the diagram are A, C, H, I, J, K, L whose completion time is 78 days. This shows a very significant improvement compared to the normal running of this project (up to 92 days).

Besides, this significant increase in time can allow more optimal work on the project with the availability of spare time remaining to cover the shortage of time if things happen that are unexpected. However, in reality it turned out that this project took place beyond the initial 92 day schedule. For this reason, using a fishbone, a detailed search of the causes of this has been carried out as described below:

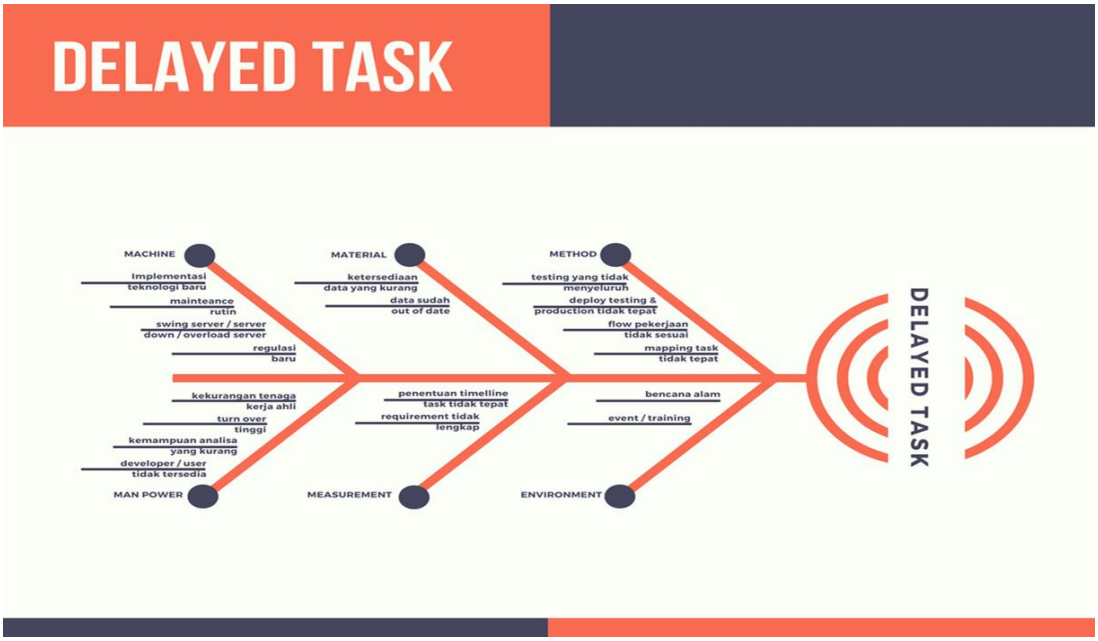

Fig 4:- Fishbone Diagram

This figure shows that the factors are :

- **Machine :** Technological advances have pushed all IT divisions to use the latest technology as well, this has affected the disruption of ongoing projects, in this case access to data has been shut down due to adjustments to the new technology. The server system is also regularly maintained to maintain its stability and performance. When this is done data access also cannot be done until the maintenance process is complete and as time goes by more and more viruses and malware can threaten the security of company data, to prevent it, new regulations are being made which when the project is running access to folder sharing becomes complicated because it has to go through a server with upload and download processes which are much slower in its implementation to ensure that the transferred data is safe from harm.

- **Material :** In every new project the data sample availability in development process is very minimal because data is only made on a case-by-case basis, so when making the project the variability of the data is very limited which results in the final testing process is not accurate enough given t he circumstances. Aside of it the number of outdated data in the middle of the project already too much and invalid because the system used for testing and development is the same as other projects both ongoing and long-finished one, so a lot of unused data enters and slows down the process.

- **Method : R**elated to material, the minimal availability of data does not allow for thorough testing so that the project is only tested in a system flow, but not much for data validity which will make the users check takes a longer time. An then the workflow is not appropriate and task mapping is incorrect

The flow that is created feels inappropriate with the working conditions, related to the task mapping which is not appropriate because when scheduling is usually only seen from the availability of the developer that is available even though the selected pic is not necessarily qualified.

- **Man :** Actually, from several points of human factors beyond natural disasters, illness or other urgent conditions the core cause is the turnover rate in the IT field is indeed very high, this causes problems propagating both in the shortage of qualified workers, the number of replacement person in charge that is sometimes lacking the analysis capability compared to the previous pic.

- **Measurements :** The Timeline determination is incorrect. This is common because there is no calculation done when closing monthly or there is maintenance with an existing system where in fact this point is also closely related to the man power factor.

- **Environment :** When there is an earthquake, flood and riot the office is closed for a special day so that the work process is completely stopped.

This is where the PDCA cycle is used, which is a cycle for continuous improvement so that the results of this study can be beneficial to both the company and the following research described as follows:

- **Plan :** Applying a schedule calculation method to maintain the effectiveness of the project (minimizing the occurrence of time wasted). After that, the project management officer approached both the IT and user teams so that they recognized and knew everyone's capabilities, as well to change from user minded project into a project based where the priority was placed on the continuity and validity of the project's results rather than merely pursuing time schedules. Besides that, they also held discussions with human resource department to find a way to reduce turnover in companies, especially IT teams which tended to be higher.

- **Do :** Execute planning that has been more mature. Based on the this case or the others.

- **Check :** Check every part of the project and recap the problems that occur in the process. And also maintaining its stability and progression.

- **Act :** Conduct an analysis of the project or review from the beginning to the occurrence of existing and new problems and re-arrange steps to identify the causes so that the next process or project can run better and repeat continuously (continual improvement)

IV. CONCLUSIONS AND RECOMMENDATIONS

- *Conclusions*

Looking at the results of the research, critical paths obtained in the form of activities A, C, H, I, J, K, L. The available schedule is 92 days, after calculating using CPM it is found that the critical path results shows this project is likely to be accelerated up to 78 days. This shows a very significant lead time. So it is possible to be able to cope if there are events that occur that are beyond expectations without the need for schedule extensions or overtime.

After further review using a fishbone diagram, the factors that cause delays in this project are machine, material, method, human, measurement and environment factors. Where the main cause lies in the human factor on the problem of high turnover that raises the problem on other factors. Which in this study the researchers tried to apply PDCA especially in the Planning section to maintain the schedule and monitor the available manpower so that it can be improved on subsequent projects.

- *Recommendations*

In determining the project schedule it is better to know in advance how the process is in it so that when determining the schedule, it is set effectively, which in this case using CPM. For further research to conduct research that examines the high turnover in the IT field as discussed.

REFERENCES

[1]. Schwalbe, K. (2015). An Introduction to Project Management, Fifth Edition. *Schwalbe Publishing*.
[2]. Sudalyanto. 2016. Implementasi Kaizen-PDCA Untuk Menurunkan Produk Reject (Non Conforming) Di PT Tozen Mechanical Product. Universitas MercuBuana. Jakarta
[3]. Purnomo, J., Krisnaningsih, E., & Khadijah, A. (2018). OPTIMALISASI WAKTU PENJADWALAN PEMBUATAN SEPATU PULLOVER MODEL QUESA DENGAN METODE PERT. *Jurnal InTent: Jurnal Industri Dan Teknologi Terpadu*, *1*(1), 24-35.
[4]. Heizer, Jay and Render Barry, (2015), Manajemen Operasi : Manajemen Keberlangsungan dan Rantai Pasokan, edisi 11, Salemba Empat, Jakarta.