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Analysis of Project Delays in the Verification of Domestic Component Level Utilization in Goods and Services Procurement in Cilacap

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Abstract:- This research is designed to analyze the factors causing delays in the verification project of Domestic Component Level (TKDN) usage in goods and services procurement in Cilacap and to provide improvement suggestions to PT XYZ. According to data from PT XYZ, the TKDN Verification project in Cilacap was only 72% complete by the set deadline, with 28% of the contracts completed outside the specified timeframe. The method used in this study is DMAIC (Define, Measure, Analyze, Improve, & Control), which involves analysis using fishbone diagrams, 5 why analysis, Pareto charts, and the 5W+1H technique. The main factors causing delays are the availability of documents, verifiers, technology systems, external factors, process documentation, and internal communication processes. Alternatives to resolve the delays in the TKDN Verification Project in Cilacap include adding manpower, a checklist for document requirements, using the system, upgrading outdated laptops for each personnel, and conducting regular coordination meetings for each verification activity.

Keywords:- *Component; Project Delays, TKDN Verification, DMAIC, Pareto Chart, Fishbone Diagram, 5W+1H.*

I. INTRODUCTION

In the implementation of government goods and services procurement, it is mandated to plan, allocate, and realize the procurement of goods and services using domestic products in ministries/agencies and local governments (Peraturan Menteri Perindustrian Republik Indonesia, 2011). The obligation to use domestic products is required during the planning and execution phases of goods and services procurement (Peraturan Pemerintah Republik Indonesia, 2018). In this context, the use of domestic products becomes a crucial indicator in the procurement process, and to calculate the percentage of local content in a domestic good or service, a verification process known as the Domestic Component Level (TKDN) verification is necessary. PT XYZ was appointed by the client to carry out the TKDN verification for combined goods and services procurement contracts owned by the client in Cilacap. In this project, PT XYZ conducted a series of TKDN verification activities, including the collection of TKDN verification documents, field surveys, data processing related to the documents, TKDN calculation, and the preparation of the TKDN verification report. However, during the execution of this project, PT XYZ encountered various factors that caused delays. In this context, PT XYZ was appointed by the client to conduct TKDN (Domestic Component Level) verification for combined goods and services procurement contracts owned by the client in Cilacap. In this project, PT XYZ carried out a series of TKDN verification activities, including the collection of TKDN verification documents, field surveys, data processing related to the documents, TKDN calculations, and the preparation of the TKDN verification report. However, during the execution of this project, PT XYZ encountered various factors that caused delays. In Figure 1.1, it can be seen that delay issues have arisen in the TKDN verification project for combined goods and services.

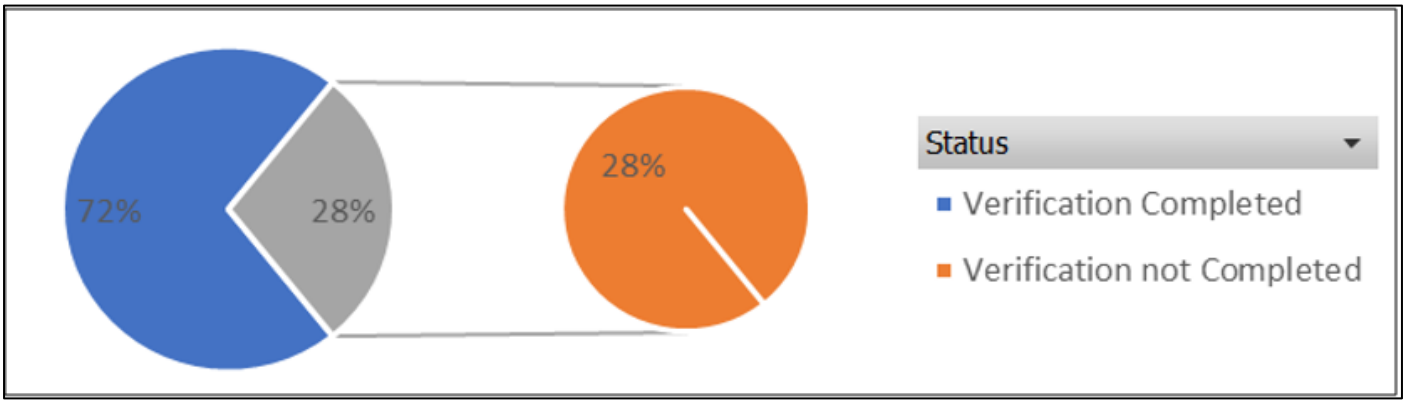

Fig 1 TKDN Verification Status

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From the data obtained in the picture above, it can be seen that the TKDN verification process was only 72% complete by the specified deadline. The estimated timeline for the completion of this project was from August 8, 2023, to October 8, 2023. However, during the process, it was found that 28% of the contracts were completed beyond the specified timeframe. For a more detailed view of the project delays, refer to the figure below.

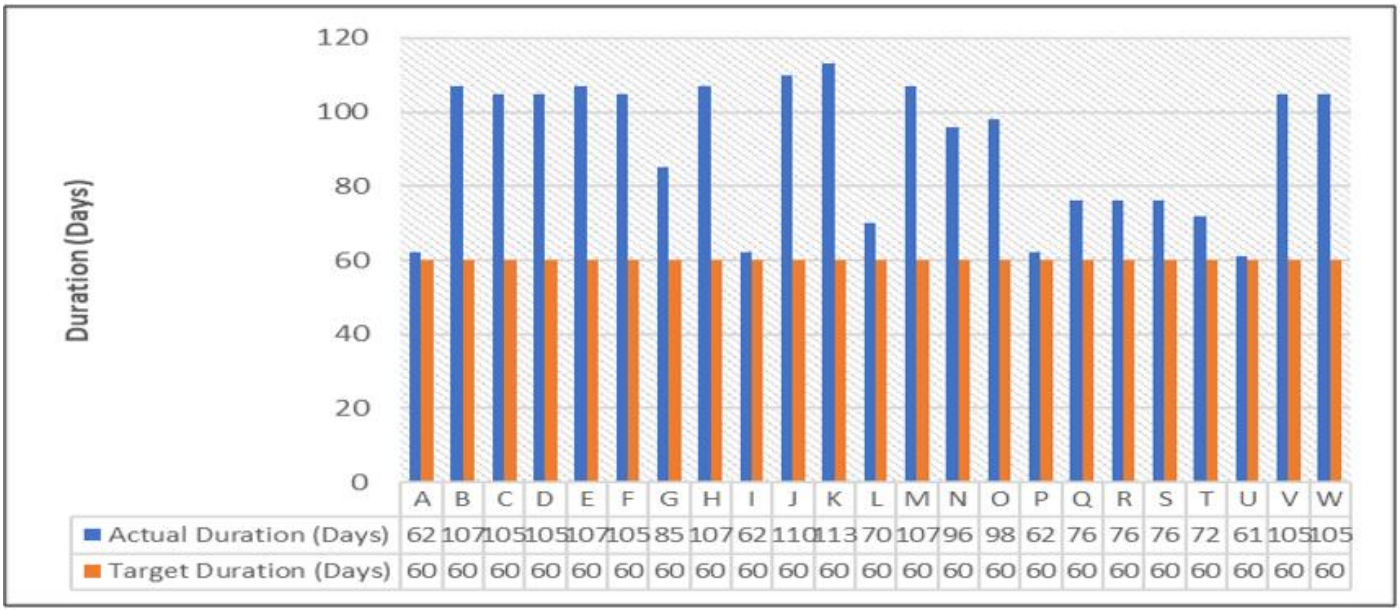

Fig 2 Project Delay Data for TKDN Verification

Based on the Picture above, it is evident that 23 verification tasks were completed outside the specified timeline. For a closer look at the project delay duration, refer to Appendix 1. Project delays have serious implications and pose a potential threat to the overall success of the project. Such delays must be avoided, as they can negatively impact the planned profit margin and even lead to financial losses for the project. Additionally, delays can have contractual consequences, including the risk of being blacklisted and damaging the company's profile, potentially affecting future contracts. Significant benefits can be gained if the TKDN verification project is completed on time or even ahead of schedule. This would avoid additional costs due to delays, protect the company's reputation, and enhance the chances of securing future projects. As a result, the service provider will strive to execute the project according to the contract schedule or even expedite it, benefiting both the client and the service provider.

Therefore, this research aims to identify the causes of delays in this project and formulate effective solutions to address these issues. One of the methods used in this research is DMAIC (Define, Measure, Analyze, Improve, Control). This study aims to identify the factors causing delays in the TKDN verification project, analyze the delay data, and provide actionable recommendations to improve project processes in the future. The results of this analysis are expected to not only provide direct benefits to PT XYZ but also to other companies facing similar challenges.

II. LITERATURE REVIEW

➢ *Project Management*

Management is the art of organizing various elements, including people and tasks. In practice, management involves both subjects and objects (Zakky, 2018). A project is a complex, non-routine activity that operates within a specific time frame, budget, and limited resources, with unique specifications for the product or service to be delivered (Heizer et al., 2017). Project management is an effort to organize a project plan by considering time constraints and resource availability (Habibi et al., 2023). It is also a discipline that involves initiating, planning, executing, controlling, evaluating, and closing team activities to achieve specific goals and meet defined success criteria within a project (Aulia & Aspiranti, 2023).

Project management is an integrated process in which individuals from an organization are engaged in maintaining, developing, controlling, and executing a program using limited resources efficiently, effectively, and on time to complete a planned project. This process is directed toward predetermined goals and continues to evolve. The three fundamental activities in project management are planning, execution, and control. These activities involve managing resources such as manpower, machinery, materials, money, methods, and information within a project (Jefri Satdika, 2022). Every project faces three constraints: cost, quality, and time, alongside equipment, materials, manpower, and Health, Safety, and Environment (HSE) considerations. The challenge in project implementation lies in time-efficient and cost-effective planning without compromising quality (Putri & Nusraningrum, 2022).

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➢ *Domestic Component Level (TKDN) Verification Project*

A project is a series of activities carried out within a specific time frame, utilizing allocated resources to achieve predefined objectives (Fazis & Tugiah, 2022). Verification is the process of matching the TKDN achievements of domestic producers and/or suppliers of goods and/or services with data collected from the business activities of these producers and/or suppliers (Peraturan Menteri Energi dan Sumber Daya Mineral Republik Indonesia, 2013). The Domestic Component Level, referred to as TKDN, represents the proportion of domestic components in goods, services, and combinations of goods and services (Peraturan Menteri Perindustrian Republik Indonesia, 2011). The government expects projects carried out in the procurement of goods and services to utilize a significant amount of domestic materials and/or services. To ensure this, the government requires that the evaluation of bids in the procurement of goods and services considers not only technical aspects and pricing but also the value of the TKDN contained within the products or services offered by the bidders (Hasan Zakaria et al., 2023). TKDN is a metric or value that represents the percentage of local content in a product or service. When measuring TKDN for a product, three key aspects are evaluated: Material, Labor, and Overhead Costs. First, Material is assessed based on its country of origin, meaning where the material was made and produced. Second, the Labor used is evaluated based on the nationality of the workers. Third, Overhead Costs, which include equipment, machinery, and other production-related expenses, are considered. The primary objective of TKDN, theoretically, is to reduce reliance on imports, stimulate local businesses, and foster the growth of new enterprises. This allows both materials and overhead costs to utilize local components, thereby minimizing production costs (Susanti, 2016).

From this explanation, it can be concluded that the TKDN verification project involves the assessment and confirmation of the domestic component level in goods, services, or combinations of goods and services. This process includes the examination and investigation of the origins of the components used in these goods, services, or combinations thereof. The entity responsible for conducting TKDN verification is an authorized body or party that ensures the products or services to be purchased or used meet the required TKDN standards. The government has appointed PT XYZ as the independent verification agency responsible for calculating and verifying the TKDN value, referred to as the Independent Verification Agency (Keputusan Menteri Perindustrian Republik Indonesia, 2023).

➢ *Project Delays*

Delays in the completion of a project can lead to operational time losses, causing the utilization of the project's outcomes to be postponed or delayed. Issues within the project can cause delays, resulting in losses, and various measures are taken to prevent such problems that lead to delays and losses (Puspitasari et al., 2020). For contractors, project delays result in time and cost losses, as the expected profits may decrease, or they may not achieve the anticipated profits at all. For project owners, delays in completing a project can lead to operational time losses, delaying the use of the project's outcomes.

➢ *Define, Measure, Analyze, Improve, and Control (DMAIC)*

Define, Measure, Analyze, Improve, and Control (DMAIC) is a data-driven problem-solving approach that facilitates incremental improvements to achieve optimal results (Talenta & Al-Faritsy, 2022). The DMAIC method is used to identify potential hazards in construction project processes and can be applied to enhance project safety and efficiency. DMAIC is an improvement method that focuses on enhancing and optimizing project analysis by addressing the issues occurring within the project (Khalimatul Inayah & Firdauzi, 2023).

The DMAIC concept (Define, Measure, Analyze, Improve, Control) is a structured problem-solving method used to measure the level of Six Sigma implementation within an organization (Syahputra & Nusraningrum, 2022). In its application, Six Sigma involves five steps: define, measure, analyze, improve, and control *control* (Maghfiro et al., 2023). The following is an explanation of the DMAIC phases in Six Sigma:

- *Define*

The Define stage is the first phase in the DMAIC methodology. In this phase, the primary problem to be solved is identified and clearly defined.

- *Measure*

The Measure stage is the second phase of the DMAIC methodology. During this phase, measurements and identification of potential sources of non-conformity within a process are carried out. The actual process capability is measured based on these potential sources of non-conformity.

- *Analyze*

The third phase, the Analyze stage involves understanding the issues by investigating the potential factors that may be causing the problem.

- *Improve*

The Improve phase focuses on proposing improvements to enhance the production system, aiming to increase product quality.

- *Control*

The final stage, Control, involves monitoring efforts to maintain the improvements that have been implemented. The goal is to ensure that the proposed improvements made during the improvement phase are sustained over time, leading to lasting enhancements in the existing processes.

➢ *Pareto Diagram*

The Pareto diagram is a quality control tool that helps analyze data based on the impact of data categories and patterns (causality) on the overall impact or problem. By using a Pareto diagram, observations can be more focused on the most significant data contributions (20/80 rule) (Purnama Nugraha & Nofirman, 2021).

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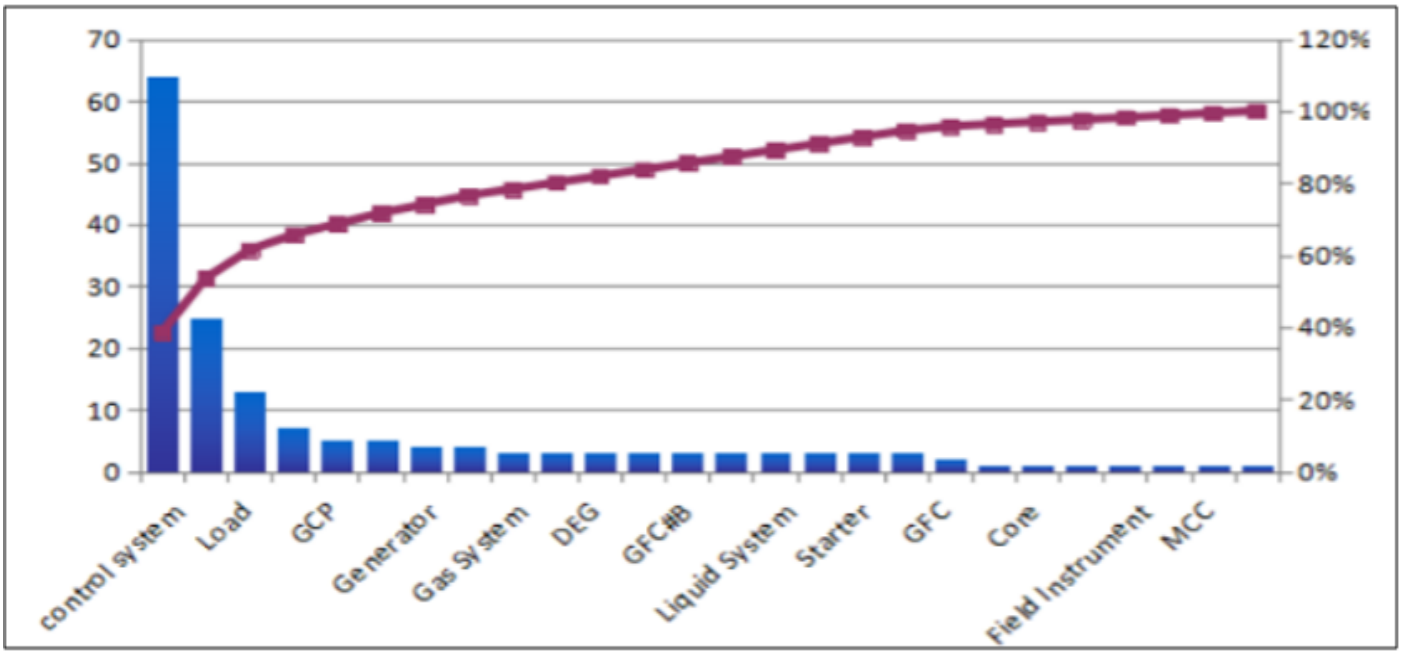

Fig 3 Pareto Diagram

In the image above, the factors causing high breakdown issues can be identified, allowing for repairs and improvements to be made (Nusraningrum & Syaputra, 2022). Pareto diagram plays a crucial role in identifying and prioritizing the most significant factors contributing to a particular issue, allowing organizations to focus their resources on areas that will have the greatest impact. By visualizing the frequency or impact of various causes, the Pareto diagram helps to identify which factors are the most influential, ensuring that corrective actions taken are both effective and efficient. Once the most influential factors are identified through Pareto analysis, these factors can serve as representatives for deeper investigation. This comprehensive approach enables teams to understand not only the key factors identified by the Pareto diagram but also their underlying causes, leading to more informed and strategic decisions on how to eliminate the root problems and enhance overall performance.

- *5 Why Analysis*

The 5 Why Analysis is a structured approach that involves repeatedly asking the question "why" to understand the root cause of a problem and to develop effective corrective actions to reduce incidents and prevent accidents from recurring (Kuswardana et al., 2023). The 5 Why's Analysis is also known as root cause analysis. The primary goal of the 5 Why's method is to identify the root cause of a problem.

- *Fishbone Diagram*

The Fishbone Diagram, also known as the cause-and-effect diagram, is a tool used to identify potential performance issues. It provides a structured framework for group discussions about the possible causes of a problem (Monoarfa et al., 2021). The Fishbone Diagram helps in identifying the root causes of issues, allowing the team to focus on more effective solutions.

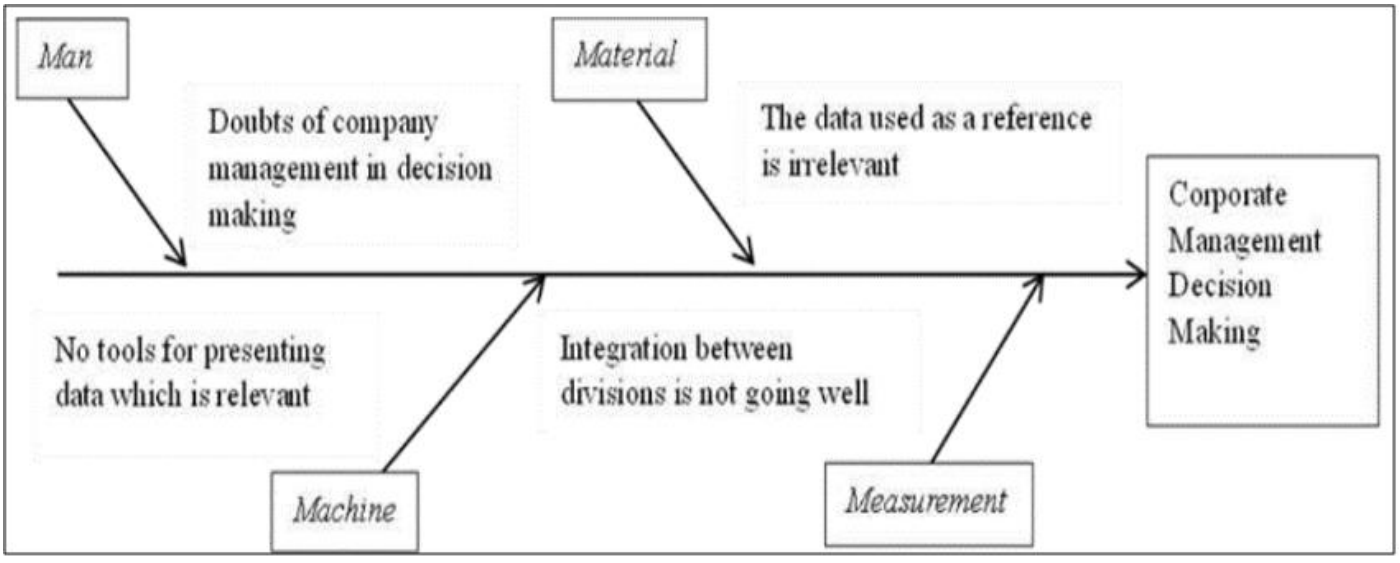

Fig 4 Fishbone Diagram

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The Fishbone diagram above is very useful for organizations that implement knowledge management. Systematically collecting group ideas can help management understand and diagnose organizational problems. The Fishbone diagram is very useful for organizations that implement knowledge management. Systematically collecting group ideas can help management understand and analyze organizational problems (Holifahtus Sakdiyah et al., 2022). In the diagram, various causes and their corresponding effects are depicted, showcasing the relationship between them. This method is instrumental in pinpointing the underlying issues that contribute to the observed problem, allowing for a structured approach to problem-solving (Hijrah & Maulidar, 2021).

➢ *5W+1H Analysis*

The 5W+1H method is an approach for examining issues by asking the questions: What, Where, Why, Who, When, and How (Nurhayati & Bellanov, 2022). 5W+1H is an acronym for six fundamental questions often used in journalism and investigation to comprehensively understand and gather information. The six questions are as follows:

- Who: This question asks who is involved or connected to a particular event or situation.
- What: This question asks what happened or what is being discussed, helping to identify the event or topic.
- When: This question asks about the timing of the event or situation, helping to determine the chronology of events.
- Where: This question asks about the location of the event or situation, helping to determine the place or region where something occurred.
- Why: This question asks about the reason or purpose behind an event or action, helping to understand the motivation or cause.
- How: This question asks how an event or situation occurred or was carried out, helping to explain the process or mechanism involved.

III. METHODS

This research is a qualitative study aimed at understanding and explaining a current, relevant issue by using factual data. The approach is conducted systematically to provide a deep understanding of the problem at hand and find an appropriate solution based on that understanding. The population in this study consists of the Verification of Local Content (TKDN) of goods and services projects in Cilacap, which experienced delays in their processes, resulting in 23 total delays identified in the verification work. The sample is a portion of the population's number and characteristics. When the population is large and it is impossible for the researcher to study all of it due to constraints like time, resources, and budget, the researcher can use a sample taken from that population (Sugiyono, 2017). The sample in this study is a saturated sample, which is a sampling technique where all members of the population are used as the sample (Sugiyono, 2017).

There are various methods of data collection; in this study, the method used is an In-Depth Interview. In-depth interviews are used as a data collection technique when the researcher wants to conduct a preliminary study to identify the problems that need to be researched, or when the researcher wants to gain deeper insights from respondents, especially when the number of respondents is small (Sugiyono, 2017). This data collection technique relies on self-reports or, at the very least, personal knowledge and beliefs. This approach helps uncover more detailed information about the factors contributing to non-conformities.

The research concept includes data processing to generate the necessary information for drawing conclusions related to the causes of project delays and possible solutions. The steps to be taken include conducting interviews and brainstorming sessions. The results of these activities will be presented in a Pareto diagram to visualize the ranking of the most significant issues. Subsequently, the identification of the root causes of the project delays will be carried out using the Ishikawa diagram (Fishbone), considering the 5M factors: Man, Material, Machine, Method, and Money, along with the 5 Why analysis. After identifying the root causes, improvement steps will be implemented using the 5W + 1H method (What, Why, When, Where, Who, and How). This method helps detail the concrete steps needed to correct the conditions causing the delays. The final step of this research concept involves creating an action plan, designed to enhance project time performance and minimize potential delays. This approach includes a series of planned actions to ensure improvements in project execution and achieve optimal results.

➢ *The Research to Address Project delay issues will follow these Steps:*

- Conduct a preliminary study to identify problems in the research object.
- Perform a literature review to determine problem-solving methods.
- Collect relevant primary and secondary data related to project information. Primary data is obtained through brainstorming and interviews, while secondary data is obtained from internal and external company records.
- Analyze the research data. Data processing will be done using the NVivo application, followed by the DMAIC stages to address the issues.
- The analysis results will produce improvement proposals.

Finally, conclusions, recommendations, and implications will be provided to the company for evaluation and follow-up to prevent similar occurrences in the future.

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IV. DISCUSSION AND RESULTS

➢ *TKDN Verification Business Process at PT XYZ*

The general overview of the business process for the TKDN (Local Content) Verification activities conducted at the company is as follows:

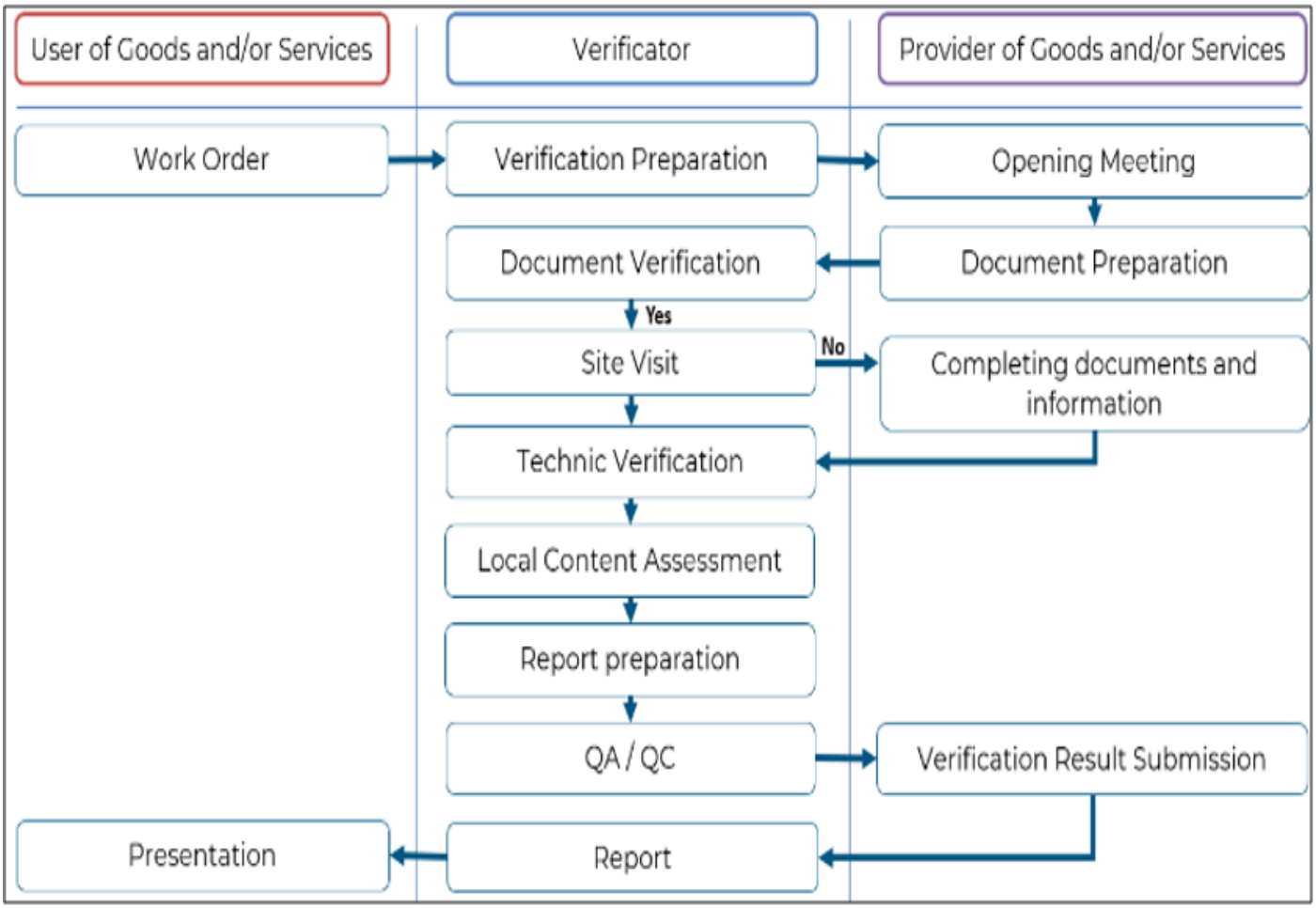

Fig 5 TKDN Verification Business Process PT XYZ

In the image above company's business process for TKDN Verification, it is apparent that the initial process begins once a project is acquired from the project owner. After acquiring the project, the company will receive a work contract and then proceed to execute the work order according to the terms outlined in the contract. This process starts with the preparation phase, which includes an Opening Meeting with the client, serving as the initial reference point for carrying out the work.

Next, the process involves the collection and verification of documents to fulfill the informational requirements concerning materials, labour, equipment, and local vendors. These requirements are met using the data and documents provided by the client. If further justification is needed regarding the information provided by the client, the surveyor will conduct field visits or direct surveys with the client to obtain additional details for the justification.

Once all documents and required information are available, the Consultant & Surveyor will assess the project to determine the percentage of Domestic Component Level (TKDN) in the project being undertaken by the client. After the calculation results are obtained, the company will conduct a Closing Meeting to provide the client with information on the determined outcomes. Following the Closing Meeting, the company will prepare a report and create a certificate document, which will then be provided to the client as the result of the completed TKDN Verification activities.

➢ *Data Collection and Analysis*

A preliminary interview was conducted to validate the factors contributing to delays in the TKDN verification project in Cilacap. Experienced and actively involved respondents in the project were asked to explain the causes of delays through a series of questions. The results of these interviews will be further processed using software applications for advanced data analysis.

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Table 1 Respondent Profile

No	Name	Job Position	Last Education	Work Experience (Years)
1	Imam Agung Prasetyo	Project Manager	S1	± 16
2	Anuggrah Arrahman Aff'dal	Assesor	S1	± 3
3	Cahya Ayu Afrisca	Assesor	S1	± 3
4	Dita Nadhira	Assesor	S1	± 3
5	Imam Prakoso	Assesor	S1	± 3
6	Risna Fitriani	Assesor	S1	± 3
7	Zsazsa Ratna Putri	Assesor	S1	± 3
8	Putri Ayu	Assesor	S1	± 3
9	Nada Permatasari	Assesor	S1	± 3
10	Chevy Amrullah	Assesor	S1	± 3
11	Ari Novianto	Consultant	S1	± 10
12	Ivan Nurisma	Consultant	S1	± 8
13	Rozi Rastafani	Consultant	S1	± 5

The data analysis in this study utilizes NVivo software. This application is highly effective in analysing data obtained from interviews with respondents. NVivo simplifies the research process by helping to organize, process, analyse, and report data, which is particularly useful given the large and unstructured nature of qualitative research data.

Although NVivo offers many features, the data analysis process involves four main steps: data import, data organization, data visualization, and data extraction. The following presents the data analysis results obtained through interviews with 13 respondents using NVivo:

- *Data Import*

The data used by the researcher consists of interviews conducted with 13 informants (TKDN verification participants in the Cilacap project), as outlined in Appendix 2.

- *Creating Codes and Themes*

After importing the data, the next step involves coding the data or creating codes. The codes were identified from the interview data.

- *Producing Interview Data Results*

Following the coding and thematic analysis of the interview data, a triangulation test was conducted on the results. The outcomes of this coding and thematic analysis using NVivo are as follows this section would typically be followed by the specific results derived from the analysis.

Table 2 Data Analysis Results on Nvivo

No	Description	NVivo Node
1	*Availability of verifiers*	13
2	*Internal communication process*	2
3	*Use of technology system*	9
4	*Availability of documents*	28
5	*External Factors*	6
6	*Process documentation*	3
Total		61

➢ *Define*

The first step in the DMAIC method is to Define. In the Define phase, the focus is on identifying the problem and determining what is needed to obtain a solution. During this stage, the problem, objectives, and scope required to achieve them are clearly defined. The causes of delays in project execution were identified by interviewing personnel directly involved in the TKDN Service Verification Project in Cilacap. The next step is data visualization, where the analysis of the data begins. Visualizing the data allows us to understand the magnitude of the delay factors reported by each respondent. Based on the processed data, several issues that frequently appeared were identified, which will be presented as follows:

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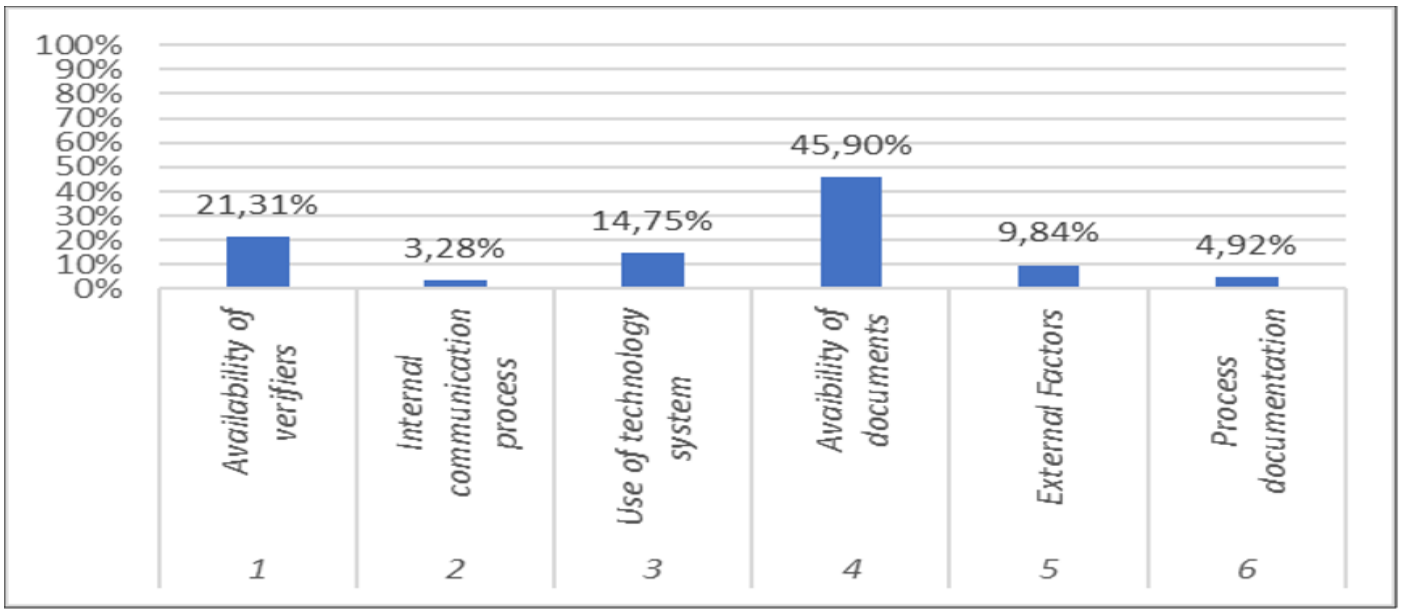

Fig 6 Data Analysis Results

➢ *Measure*

The measurement phase in this stage relates to the most dominant causes of delay. After outlining the issues in the Define phase, the process continues with the measurement phase. In this phase, the collected data is used to create a Pareto diagram. The data collected during the interviews is used to create the Pareto diagram after identifying the contributing factors. The data will then be displayed in the Pareto diagram to identify discrepancies based on the causes of the project delays.

Table 3 Cumulative Percentage

No	Description	Number of Occurrences	Percentage of Occurences	Cumulative Percentage
1	*Avaibility of documents*	28	45,90%	45,90%
2	*Availability of verifiers*	13	21,31%	67,21%
3	*Use of technology system*	9	14,75%	81,97%
4	*Process monitoring*	6	9,84%	91,80%
5	*Process documentation*	3	4,92%	4,92%
6	*Internal communication process*	2	3,28%	8,20%
Total		61	100,00%	

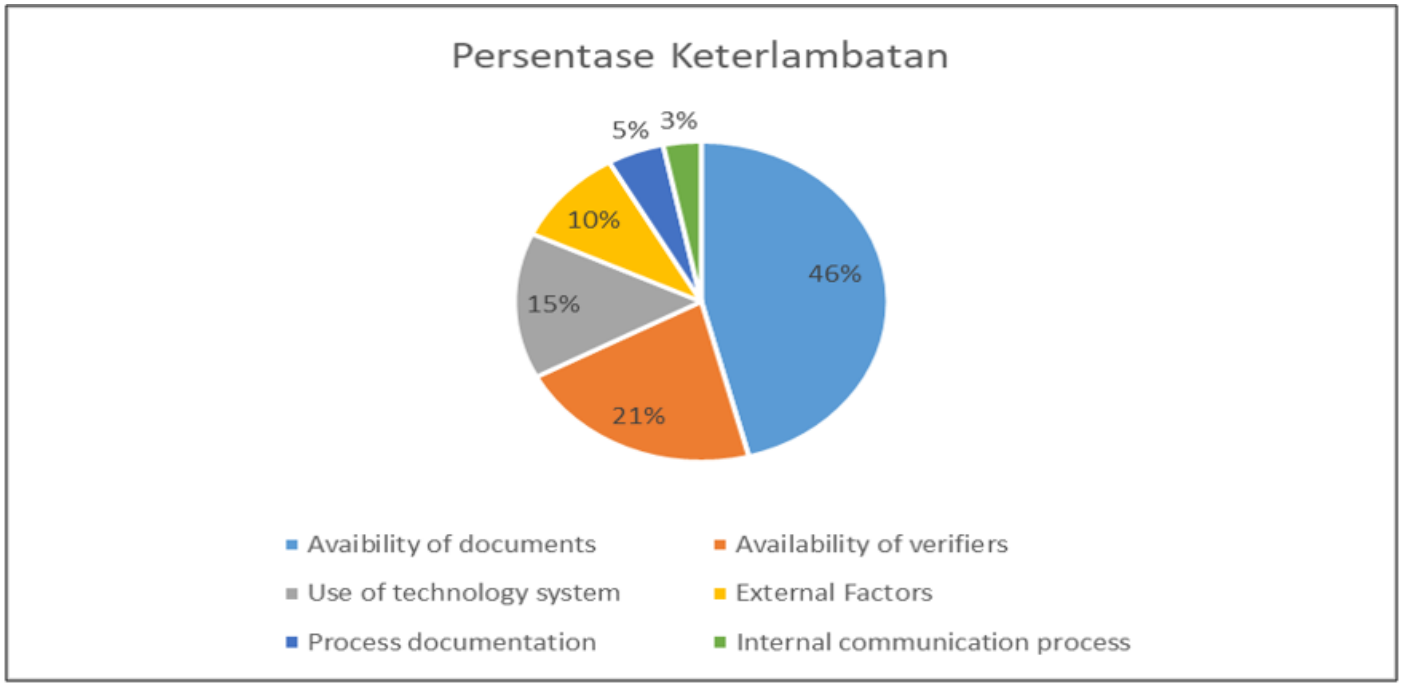

Fig 7 Percentage Chart of Causes of Delays

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- *With the Cumulative Calculation of the Number of Occurrences in the Figure, the following Pareto Diagram is Obtained:*

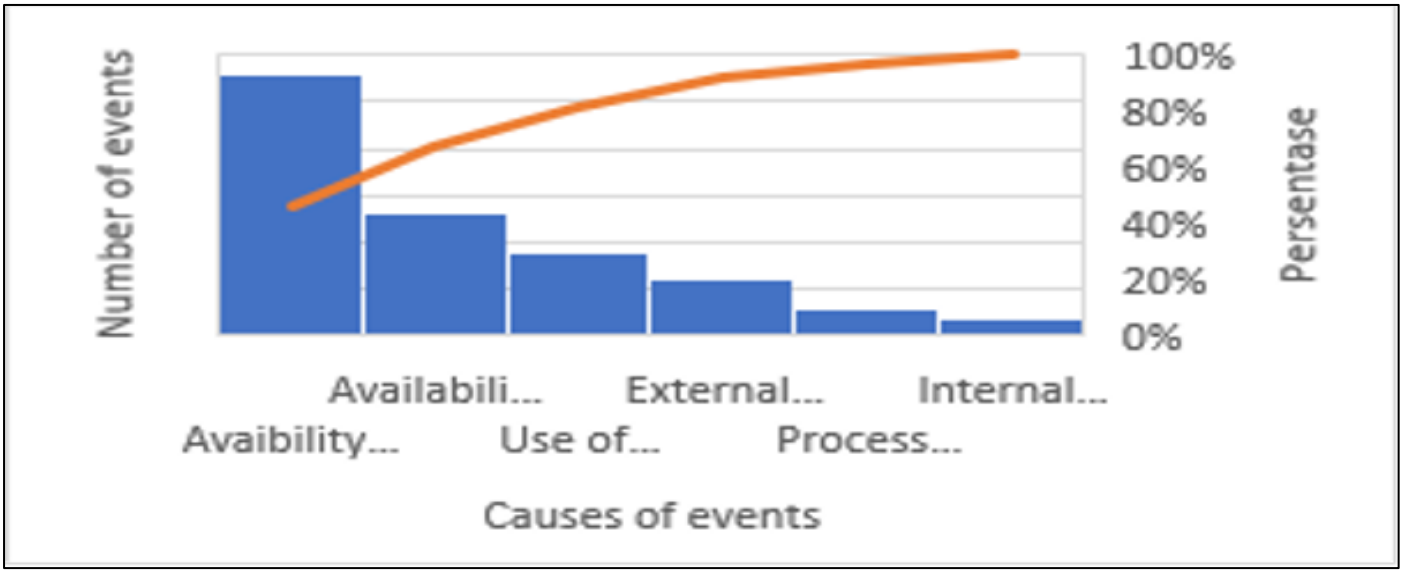

Fig 8 Pareto Diagram

According to the Pareto principle, 80% of failures are areas that need to be focused on for resolution, and 20% are the causes. Based on the Pareto diagram in Figure 8, it is evident that the most frequent issues during the interview stage are document availability, verifier availability, and technology usage. Therefore, further investigation into the root causes of these dominant delay factors is necessary to make improvements or minimize existing delays.

➢ *Analyze*

It can be observed from the Pareto diagram that the main causes of delays are due to three aspects: document availability, verifier availability, and technology usage. To understand the reasons behind these delays, a Fishbone diagram (also known as Ishikawa or cause-and-effect diagram) is used. The Fishbone analysis is as follows:

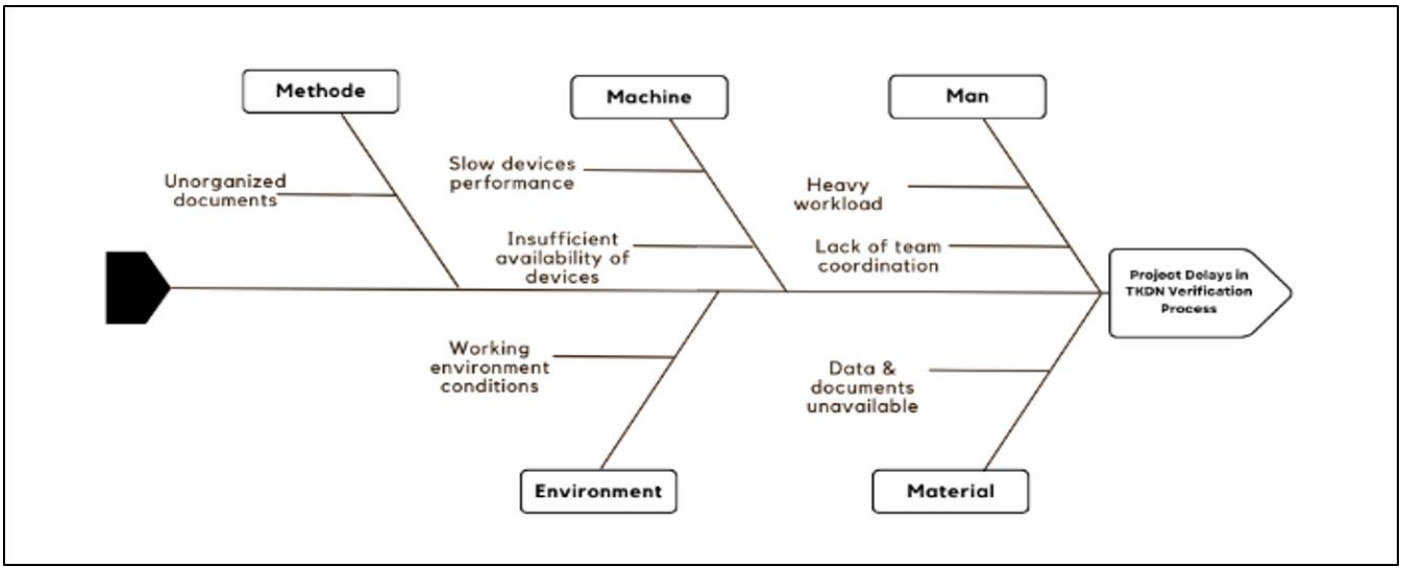

Fig 9 Fishbone Diagram

From the six factors suspected to cause project delays, as shown in the Fishbone diagram above, the main causes of project delays were identified based on the analysis of possible sub-causes:

- Man: Lack of team coordination and heavy workload
- Machine: Insufficient availability of laptops & slow laptop performance
- Method: Disorganized documents
- Material: Data & documents are unavailable
- Environment: Working environment conditions

These sub-causes were then further analyzed using the 5 Why analysis by asking "why" five times to uncover the root causes of the problem. The analysis is presented in the following table:

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Table 4 5Why Analysis

Sub-Cause	*Why?*	*Why?*	*Why?*	*Why?*	*Why?*
Heavy workload	Accumulation of tasks	Lack of verification personnel	Lengthy recruitment process	Insufficient recruitment planning	
Lack of team coordination	No regular meeting schedule	Lack of preparation at the start of the project			
Insufficient laptop availability	Slow laptop procurement process	No standard for laptop replacement			
Slow laptop performance	Unavailability of laptop spare parts	No standard for spare part replacement			
Data & documents unavailable	Client doesn't understand the verification process	Client unaware of regulatory policies	No awareness campaign from the employer		
Documents disorganized	Document management is still manual	No digital system for document management	The company has not implemented specific procedures for document management		
Work environment conditions	Personnel work environment is constantly changing locations				

➢ *Improve*

The improvement phase involves determining proposed solutions to address the root causes identified during the analysis phase. This is done through brainstorming sessions utilizing tools such as the 5 Why analysis and the fishbone diagram. The improvement plan targets all factors contributing to the delays in the TKDN verification project at PT. XYZ. The goal is to develop corrective actions that will help meet project targets more effectively. The methodology employed to formulate these improvement proposals is the 5W+1H method, which outlines detailed plans and actions for addressing each identified cause of the delays. This structured approach ensures that each factor is thoroughly considered, and actionable steps are taken to eliminate or mitigate the issues, thereby enhancing the overall efficiency and timeliness of the project.

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Table 5 5W+1H

5M	No	What	Why	Who	When	Where	How
Man	1	Heavy workload	Lengthy recruitment process	Project Manager, IT	When the workload increases	Company	Add more verification personnel as soon as possible and create a tracking system for progress so that verification status can be monitored and priorities can be set.
	2	Lack of team coordination	Lack of planning and scheduling at the start of the project	Project Manager	Throughout the project	Company	Schedule regular coordination meetings to monitor the verification status.
Machine	1	Insufficient availability of laptops	No standard for laptop replacement	Project Manager, IT	When laptop needs are unmet	Company	Establish a standard for laptop replacement and expedite the procurement of laptops.
	2	Slow laptop performance	No standard for spare parts replacement	Project Manager, IT	When using heavy applications or multitasking	Company	Establish a standard for spare parts replacement and upgrade hardware (RAM, SSD).
Material	1	Data & documents unavailable	No awareness of the verification process from the employer	Client	During the verification process	Company	Conduct an orientation or explanation related to TKDN before the work begins to ensure all parties understand the required document specifications and provide a data verification checklist.
Methode	1	Unorganized documents	No document management system	Project Manager, IT	When storing data	Company	Implement a system for organizing verification data
Environment	1	Working environment conditions	The nature of the verifier's work requires field visits or working in various locations	Project Manager	When verification tasks require relocating work	Various verification project locations	Provide adequate logistical support, such as transportation and accommodation, and ensure good communication between verifiers and management to reduce stress and improve efficiency.

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➢ *Control*

After implementing the improvements in the improvement phase, the next step is the Control phase, which has either been carried out or planned. The findings from this study revealed several factors contributing to delays, which include the following:

- *Document Availability:*

The primary issue causing delays in the TKDN verification project is the availability of documents. This issue arises because the employer has not conducted any orientation for the clients, resulting in obstacles during the document verification process. The following statements from informants during the interviews illustrate this:

"Yes, that's correct, Mr. Her. Some vendors seemed to be unaware of TKDN requirements because they hadn't received any orientation, which made it difficult at the beginning. We ended up having to explain things repeatedly, and this extended the data collection process."

"This can be another challenge where they haven't gathered supporting documents specific to this project, so it takes them longer to find documents like purchase receipts, materials, equipment, and so on."

Based on these statements, it can be concluded that the issue with document availability in the TKDN verification process is due to the lack of orientation provided by the employer. Thus, as suggested in the previous analysis, it is recommended for future similar projects that the employer should conduct an orientation for every client at the start of the tender and again before the TKDN verification process begins. The lack of this orientation has led to external factors being uncooperative with the verification process, as explained by another informant:

"Many companies refused to provide the data and documents required for this verification process. Why do they refuse? In this verification process, we ask for data they consider highly confidential, such as their purchase data or capital costs. These are the kinds of things that we believe need to be communicated to the vendors, collaboration between the verification company and the employer to explain the purpose of this activity. Hopefully, the users will also be able to provide understanding to them, so the verification process can be completed within the set timeframe."

Conducting orientation related to the TKDN verification process is crucial so that clients can carry out the verification process properly and prepare the necessary TKDN verification documents before the verification begins.

- *Availability of Verifiers:*

Another issue highlighted by this study is the availability of verifiers. Here are some responses from informants during interviews conducted by Risna and others:

"Sometimes, one person has a lot of work because the verification work isn't just in Cilacap but also in many other locations. Besides, there are other commercial tasks, so from a quantity perspective, I think we are still lacking."

"It could be an internal issue because of the high demand from our users at that time, and our personnel needs were also insufficient. We lost track of some work assignments, maybe this could be a suggestion for us in the future to better monitor the work assignments of our team, perhaps with a system."

Based on the statements above, it can be concluded that the company needs additional personnel to expedite the verification process and reduce the existing workload. The lack of personnel in the company has delayed the TKDN verification process due to the heavy workload, coupled with the absence of a system to monitor the workload of personnel, which could prevent work overload. The implementation of such a system could also address documentation issues, as mentioned by an informant:

- *"Document Data often goes Missing."*

From the above statement, it can be inferred that using a system could also address this issue, where the system would regularly save data and simplify the existing business processes.

- *Technology System Usage:*

Another factor identified was the usage of the technology system. It was found that some personnel still haven't received equipment from the office, and some necessary work tools are still unavailable at the company. The following are some statements from the informants:

"Yes, Mr. I haven't received a company laptop yet, and my current laptop often crashes with a blue screen. I think I need a replacement."

"There are some issues like some functions not working. I have a few things that aren't functioning properly."

- *Internal Communication:*

Another issue was internal communication, as identified from the informants' responses during the interviews:

"This is another issue—there's a lack of coordination, and there's no sharing of the challenges encountered in the field."

The company must conduct follow-up coordination to avoid issues related to misinformation among personnel.

➢ *Discussion*

This study utilized the DMAIC method to identify six key factors causing delays in the TKDN verification project in Cilacap, namely: document availability (45.90%), verifier availability (21.31%), technology system usage (14.75%), external factors (9.84%), process documentation (4.92%), and internal communication (3.28%). Based on this analysis, various alternative solutions were proposed. To address the issue of document availability, it is recommended to conduct regular socialization with clients before the verification process begins, as well as to maximize the use of a document requirement checklist. Meanwhile, the issue of verifier

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availability can be resolved by increasing the number of personnel and utilizing a digital system to monitor performance.

Other alternatives include enhancing technological capacity by providing additional laptops and necessary spare parts, as well as conducting socialization and providing data confidentiality agreements to clients to build trust in the verification process. Process documentation can be optimized with a digital system that stores documents neatly and makes them easily accessible. Lastly, internal communication can be improved through regular evaluations and performance monitoring, either through virtual or offline meetings, to ensure smooth verification processes and to address any challenges encountered in the field.

The managerial implications of this research indicate that several significant changes have been implemented to enhance the efficiency and effectiveness of the TKDN verification process. First, socialization is now conducted not only before the verification process but also during the client's ongoing work. This allows clients to better understand the verification process and prepare the necessary documents. Second, the previously existing personnel shortage has been addressed by adding two new team members and implementing a digital system that facilitates easier monitoring and evaluation of the workload. Third, additional laptops have been provided to support the use of technology in daily operations. Furthermore, clients are now provided with a data confidentiality agreement, enabling more comprehensive data verification and encouraging clients to undergo the verification process. In terms of documentation, the digital system has been optimized to ensure that verification documents are stored systematically and can be accessed virtually by verifiers. Lastly, the previously irregular schedule monitoring is now conducted through weekly evaluation meetings, allowing for more effective monitoring and evaluation of the schedule with the team. These changes have had a positive impact on improving operational efficiency and transparency in the TKDN verification process.

V. CONCLUSION AND RECOMMENDATION

- *Conclusion*

Based on the results and analysis of the interviews conducted to address delays in the TKDN verification project in Cilacap, the following conclusions were drawn from the analysis using Pareto diagram tools: the most significant cause of delays is document availability, followed by the availability of verifiers, technology system usage, external factors, process documentation, and internal communication processes.

After conducting the analysis using the DMAIC method, alternative solutions to address the delays for PT. XYZ includes distributing a checklist of document requirements for TKDN verification to clients undergoing verification. Additionally, regular evaluation and monitoring should be conducted for each task to enable informed decision-making. The system should be maximized as a tool for monitoring employee performance and tracking the verification process to ensure activities align with the established work plan.

The system can also be used to monitor the progress of each verifier, document verification results to store each verification activity's outcome, and ensure that personnel can easily access the required documents at any time. Updating outdated laptops for each staff member is necessary to ensure optimal performance, and repairs should be made promptly if any laptops are damaged. Regular coordination meetings, whether online or offline, should be held for each verification activity to resolve any issues faced by verifiers effectively.

- *Recommendation*

The company and stakeholders should enhance awareness regarding document availability by urging employers to inform clients to conduct socialization before and after completing their work. PT XYZ needs to distribute a checklist of document requirements for TKDN verification to clients undergoing verification. This implementation will help clients understand the importance of the TKDN verification process and ensure the availability of required documents, thus reducing delays caused by missing documents.

The company is required to add personnel and perform performance evaluations. Adding staff for upcoming verification processes will reduce the workload and speed up the verification process. Additionally, regular evaluation and monitoring of each task are necessary. Maximize the use of the system to monitor employee performance and track the verification process. Regular evaluations and monitoring will assist in timely decision-making, and the system will ensure that activities proceed according to the established work plan.

Refresh and maintain work equipment by updating outdated laptops for each staff member and promptly repairing any laptop damage. This will ensure optimal performance of work tools and prevent technical issues from hindering the verification process.

Routine coordination meetings should be scheduled for each verification activity, both online and offline. These regular meetings will ensure that any issues faced by verifiers are effectively resolved and will improve coordination and communication among the team.

REFERENCES

[1]. Aulia, N. A., & Aspiranti, T. (2023). Analisis Pengendalian Proyek dengan Menggunakan Metode Critical Path Method (CPM) untuk Meminimumkan Waktu Pengerjaan Proyek. Bandung Conference Series: Business and Management, 3(1). https://doi.org/10.29313/bcsbm.v3i1.7184

[2]. Fazis, M., & Tugiah, T. (2022). Perencanaan Proyek dan Penjadwalan Proyek. Jurnal Sosial Teknologi, 2(12). https://doi.org/10.59188/jurnalsostech.v2i12.517

[3]. Habibi, I., Nugraha, F. Z., & Sutrisno, S. (2023). Penerapan Critical Path Method pada Penyelesaian Proyek Rehabilitasi Jalan Parigi Lama di Kabupaten Sumedang. Go-Integratif : Jurnal Teknik Sistem Dan Industri, 4(01). https://doi.org/10.35261/gijtsi.v4i01.8307

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/IJISRT24AUG1249

[4]. Hasan Zakaria, A., Firdaus, F., Febriansyah Arifin, K., Munawar, sum, & Gunawan, A. (2023). Pengaruh Penerapan Kebijakan TKDN (Tingkat Komponen Dalam Negeri) Terhadap Daya Saing Produk Keramik. In Jurnal Ekobis Dewantara (Vol. 6, Issue 1).
[5]. Heizer, J., Render, B., & Munson, C. (2017). Operation Management, Sustainbility and Supply Chaing Management (12th ed).
[6]. Hijrah, H., & Maulidar, M. (2021). Analisis dan Perancangan Sistem Manajemen Inventaris Menggunakan Metode Fishbone. Jurnal Teknologi Dan Manajemen Informatika, 7(2). https://doi.org/10.26905/jtmi.v7i2.6501
[7]. Holifahtus Sakdiyah, S., Eltivia, N., & Afandi, A. (2022). Root Cause Analysis Using Fishbone Diagram: Company Management Decision Making. Journal of Applied Business, Taxation and Economics Research, 1(6). https://doi.org/10.54408/jabter.v1i6.103
[8]. Jefri Satdika. (2022). The Analisis Manajamen Kontruksi Proyek Pembangunan Gedung Puskesmas Kajeung Kecamatan Sungai Mas. Jurnal Ilmiah Teknik Unida, 3(1). https://doi.org/10.55616/jitu.v3i1.211
[9]. Keputusan Menteri Perindustrian Republik Indonesia. (2023). Penunjukan Lembaga Verifikasi Independen Pelaksana Perhitungan dan Verifikasi Besaran Nilai Tingkat Komponen Dalam Negeri dan Nilai Bobot Manfaat Perusahaan.
[10]. Khalimatul Inayah, S., & Firdauzi, B. (2023). Analisis Manajemen Risiko K3 Metode Dmaic Pada Pekerjaan Proyek XYZ di Kabupaten Karawang. 18(1), 59–67. https://doi.org/10.26623/teknika.v18i1.6134
[11]. Kuswardana, A., Eka Mayangsari, N., & Natsir Amrullah, H. (2023). Analisis Penyebab Kecelakaan Kerja Menggunakan Metode RCA (Fishbone Diagram Method And 5-Why Analysis) di PT. PAL Indonesia.
[12]. Maghfiro, Y., Damat, D., & Manshur, H. A. (2023). Pengendalian Kualitas Proses Pengolahan Teh Hitam Ortodox Menggunakan Metode DMAIC Di PT. Pagilaran. AGRISAINTIFIKA: Jurnal Ilmu-Ilmu Pertanian, 7(1). https://doi.org/10.32585/ags.v7i1.3635
[13]. Monoarfa, M. I., Hariyanto, Y., & Rasyid, A. (2021). Analisis Penyebab Bottleneck pada Aliran Produksi Briquette Charcoal dengan Menggunakan Diagram Tulang Ikan. Jambura Industrial Review, 1(1).
[14]. Nusraningrum, D., & Syaputra, Y. (2022). RAM Analysis at Gas Turbine Power Plant with Six Sigma Method. European Journal of Business and Management Research, 7(4), 356–361. https://doi.org/10.24018/ejbmr.2022.7.4.1609
[15]. Peraturan Menteri Energi dan Sumber Daya Mineral Republik Indonesia. (2013). Penggunaan Produk Dalam Negeri Pada Kegiatan Usaha Hulu Minyak dan Gas Bumi.
[16]. Peraturan Menteri Perindustrian Republik Indonesia. (2011). Ketentuan dan Tata Cara Perhitungan Tingkat Komponen Dalam Negeri.
[17]. Purnama Nugraha, A., & Nofirman. (2021). Pemakaian Spare Part Bus Transjakarta Dengan Metode Diagram Pareto. JTTM : Jurnal Terapan Teknik Mesin, 2(1). https://doi.org/10.37373/jttm.v2i1.80
[18]. Puspitasari, Y. I., Mangare, J. B., & Pratasis, P. A. K. (2020). Analisis Faktor-Faktor Keterlambatan Pada Proyek Perumahan Casa De Viola dan Alternatif Penyelesaiannya. Jurnal Sipil Statik, 8, 141–146.
[19]. Putri, C. G., & Nusraningrum, D. (2022). Subcontractors Selection of Building Construction Project Using Analytical Hierarchy Process (AHP) and Technique for Others Reference by Similarity (TOPSIS) Methods. Jurnal Manajemen Teori Dan Terapan | Journal of Theory and Applied Management, 15(2). https://doi.org/10.20473/jmtt.v15i2.35915
[20]. Sugiyono. (2017). Metode Penelitian Kuantitatif, Kualitatif, dan R&D (Alfabeta).
[21]. Susanti, I. (2016). Evaluasi Kualitas Layanan Jasa Sertifikasi Tingkat Komponen Dalam Negeri (TKDN) Di PT. Sucofindo. Jurnal PASTI.
[22]. Talenta .P, S., & Al-Faritsy, A. Z. (2022). Penggunaan Metode DMAIC dan Poka Yoke Dalam Meminimalkan Terjadinya Cacat Produk Manhole Cover. Jurnal DISPROTEK, 13(2). https://doi.org/10.34001/jdpt.v13i2.3067
[23]. Zakky. (2018). Pengertian Manajemen Menurut Para Ahli Secara Umum. In Zona Referensi.