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ABSTRACT

The establishment of BUMN holding companies transfers certain functions of the subsidiary to the parent organization, as exemplified by cement industries (PT. XYZ). The transfer of the sales function to the holding through a mega distributor changed the role of the subsidiary from profit- to cost-centered. Following this change, the subsidiary was required to achieve the standard cost set by the holding. Therefore, this research attempts to evaluate the strategy to realize the subsidiary's standard cost of production activities using an Activity-Based Management (ABM) approach. The research was conducted using a semi-structured interview method. Subsequently, the results showed that the subsidiaries were unable to achieve the standard cost of production due to the defective operation that caused by of non-value-added activities in production process and plants that are not operated optimally. One of the reasons for the substandard operation is non-optimal maintenance. Although subsidiaries have sought continuous improvement through Total Productive Maintenance (TPM), the total production cost remains almost unaffected by the economic benefits of those projects. There are opportunities to enhance the achievement of the company's standard production cost while seeking optimal production capacity, such as reducing non-value-added activities.

Keywords: Activity-Based Management; Continuous Improvement; Cost; Standard; TPM

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1. INTRODUCTION

BUMNs in Indonesia are regulated by UU No. 19 of 2003 about State-Owned Enterprises (SOEs). These organizations are regarded as unique because they are a merger of two entities, namely Businesses and the State (BUMN, 2019). This affects the performance of SOEs, which is inseparable from the government bureaucracy.

The level of business competition promotes SOEs to possess strong, agile, transparent corporate structures and powers for competing at local, regional, and global levels (BUMN, 2019). The government strives to restructure SOEs and enhance their competitiveness under existing business conditions. Four SOE restructuring alternatives that can be executed are holding, merger, consolidation, and takeover. Holding is the formation of a new legal entity as an asymmetric controller that oversees and maintains the existence of two or more SOEs (Pranoto & Makaliwe, n.d.)

The government's policy to create strategic holdings for SOEs engaged in similar business fields started in 2012. Although efforts to restructure these enterprises began in 1998-1999, the architecture of SOE development could not be achieved due to political factors (Pranoto & Makaliwe, n.d.).

In August 2020, a state-owned holding company engaged in infrastructure formed a mega distribution network to centralize sales and support its business transformation program. This mega distributor operates with a single channel model for the sales of company products and is expected to significantly assist in streamlining the administrative process, thereby increasing opportunities for cooperation with other manufacturing companies.

The object of this research was PT. XYZ, a subsidiary of an SOE holding involved with the cement industry. This was interesting because the subsidiary established a mega distributor to specifically handle the sales of cement products, which led to a change in the business structure that previously focused on revenues and costs (profit-centered) to concentrating only on cost (cost-centered). In October 2021, the total cost of the PT. XYZ's production division was 95% of the company's total costs, which was above the 93% standard cost set by the holding. Therefore, the change in the business structure of PT. XYZ is expected to reduce the company's production cost to meet the standard determined by the holding.

Previous research by Kren (n.d.) explained that Activity-Based Management (ABM) provides a useful framework for controlling costs in organizations. ABM can be used to evaluate costs of non-value-added activities and excess capacity in production. This research illustrated a cost savings calculation resulting from eliminating non-value-added activities for a service company.

Following the change in business structure resulting from the shift of sales function to a mega distributor, PT. XYZ transformed from profit-centered into a cost-centered

organization. Hence, this research synthesized several formulations in quest of a solution by examining:

1. What are the efforts of PT. XYZ to achieve the standard cost set by the holding company using the ABM activity analysis approach?
2. What are potential improvements could be done by PT. XYZ to reduce current costs and ensure the standard determined by the holding company was achievable?

Based on research by Ellet (2018), the purpose of evaluation and problem diagnosis scenarios were related in this investigation to produce two aims, namely:

1. To evaluate the strategy employed by PT. XYZ and provide feedback related to the efforts expended in achieving the standard cost determined by the holding company.
2. To diagnose the problems and recommend new improvement efforts that can significantly reduce company costs and ultimately contribute to achieving the predetermined standard costs.

This research was presented in six sections, namely introduction, theoretical review, research methodology, organization profile, results and discussion, and conclusions. The interview questions were attached separately.

2. LITERATURE REVIEW

2.1. ACTIVITY-BASED MANAGEMENT (ABM)

According to Hansen et al. (2018), ABM is an integrated management approach that focuses on activities that improve the value provided to customers as well as the profit generated by this value. It is based on the concept of Activity-Based Costing (ABC), which is one of the significant discoveries in management accounting. Berg & Madsen (2020) attempted to synthesize previous research related to ABC and create a more comprehensive description of Activity-Based Thinking (ABT). Generally, ABT comprises a range of activity-based innovations, such as ABC, ABM, and Time-Driven ABC (TDABC). ABC is a means to obtain an accurate product cost calculation, while ABM is a means to increase profitability. ABM has two dimensions, namely:

- Cost Dimension to improve the cost assignment accuracy.

- Process Dimension to seek cost reduction through continuous improvement.

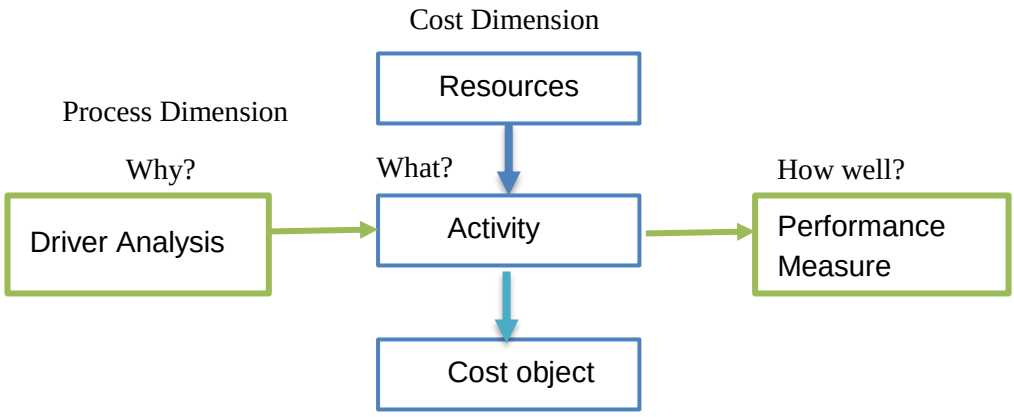

Figure 1. ABM Dimension

Source: Hansen et al. (2018) (has been reprocessed)

Figure 1 shows that the cost dimension of ABM provides information related to specific activity resources and cost objects, such as products, customers, suppliers, and distribution channels. The objective of the ABM cost dimension is to improve the accuracy of cost allocation by tracing and reallocating activity costs to cost objects. This dimension facilitates an organization to engage and measure continuous improvement (Hansen et al., 2018).

ABM is a combination of the ABC concept and Process Value Analysis (PVA). There are three major components of PVA as follows:

- Driver analysis: begins with identifying the root causes and circumstances that cause a change in costs or initiation of activities,
- Activity analysis: involves deciding the activities performed, the number of people involved, the duration and resources required, as well as the value of activities to the company. Based on this determination, value-added and non-value-added activities can be distinguished. Value-added activities are classified as mandatory and non-discretionary, while non-value-added activities involve scheduling, moving, waiting, inspecting, and storing.
- Performance measurement: includes financial or non-financial aspects as well as measurement in terms of efficiency, quality, and time towards innovation (Hansen et al., 2018).

Another explanation related to the main components of ABM includes the Balanced Scorecard as a measuring tool for performance measurement (Ponisciakova, 2020). By controlling the process, a company can determine the level of costs and profits as well as the degree of added value or other attributes of the value creation process.

Previous research related to the application of ABM shows that the use of ABC/M in the hexagonal operation framework provides many benefits. The examined company managed to reduce work-in-process inventory and increase product quality acceptance in the first-time process by focusing on cost drivers and value-added processes (Gupta & Galloway, 2003).

Research by Kren (n.d.) to evaluate the use of ABM to control costs also showed that the calculation of excess capacity and non-value added activity costs can enable managers to distinguish between capacity management and operational efficiency, respectively. Both estimates direct managers in implementing cost controls and help avoid the mistake of improving operational efficiency instead of capacity management, and vice versa.

2.2. VALUE-ADDED ACTIVITY ANALYSIS

According to Blocher et al. (2019), management can ensure no activities are missed in the value-added analysis by preparing a process map, which is a diagram that identifies each step in the manufacture of a product or service.

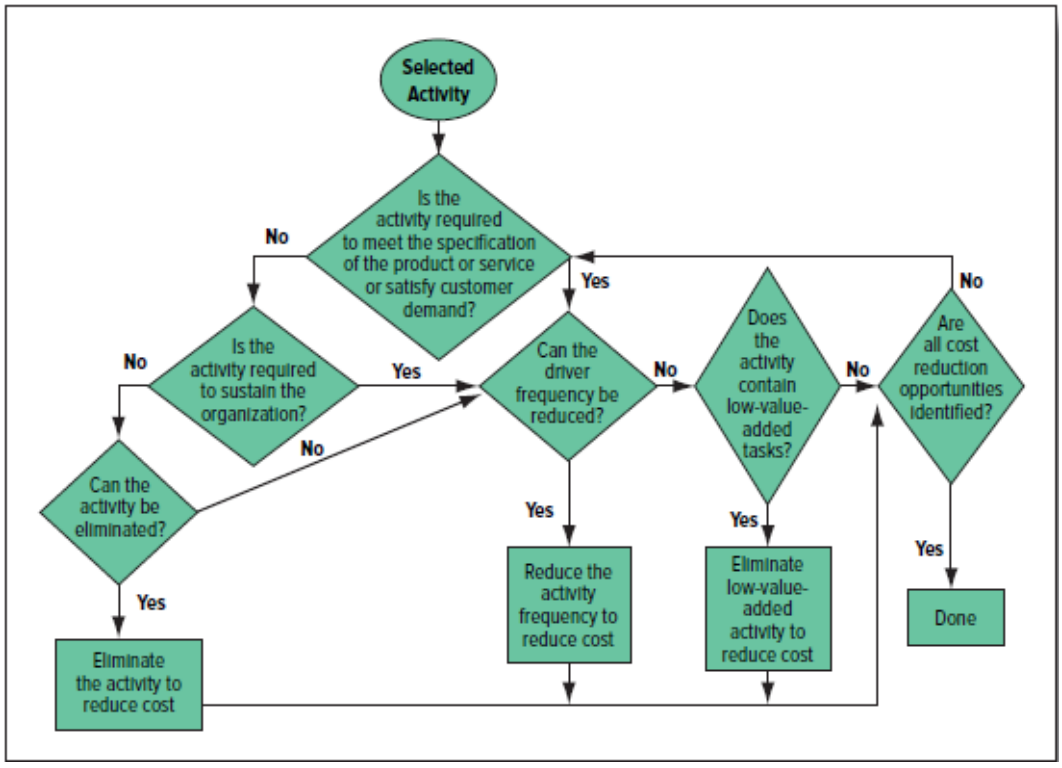

Figure 2. Example of Value-Added Activities Analysis

Source: Blocher et al., (2019)

As shown in Figure 2 above, the value-added nature of an activity may be analyzed by assessing its use in creating a product that matches specifications or satisfies customer needs. Supposing the product does not serve that purpose, its need for organizational sustainability may be evaluated. For products that are not beneficial to sustainability, the next route of intervention would be the possibility of eliminating the activity for cost reduction. Assuming the activities are required to meet customer specifications or needs, the probability of reducing the driver frequency can be evaluated. In cases where their frequencies cannot be reduced, low value-added activities may be eliminated to decrease costs. Otherwise, the events should be examined to ensure all cost reduction opportunities have been identified and an unfinished analysis should be repeated to ensure the creation of products that fulfill specifications or meet customer satisfaction demands. An affirmative response signifies that the value-added analysis process is complete.

2.3. NON-VALUE-ADDED ACTIVITIES

Non-value-added activities are not beneficial to the company's internal and external customers. They fail to produce changes for the next process stage and result in the repetition of activities due to poor initial execution. The general rules for non-value-added activities are:

- State-detection,
- Repetition as a result of state-correction

According to Hansen et al. (2018), non-value-added activities frequently include scheduling, moving, waiting, inspecting, and storing. Activity management may reduce costs in four ways, namely elimination, selection, reduction, and sharing.

2.4. CONTINUOUS IMPROVEMENT

Continuous improvement is the constant effort to increase the efficiency and productivity of activities through waste reduction, quality improvement, and cost management. The philosophy of Total Quality Management (TQM) intends creating an environment that allows workers to produce a perfect zero-defect or quality products that are acceptable to the market. TQM creates the need for a management accounting system that provides quality-related information, including cost measurement.

A common tool used in continuous improvement is the Plan-Do-Check-Act system.

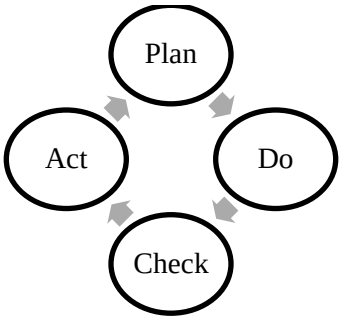

Figure 3. Continuous Improvement Cycle

Source: Hansen et al., 2018 (has been reprocessed).

As shown in Figure 3, continuous improvements are an unending circular process. Every applied improvement continues by planning for the next implementation through a repetitive process.

3. RESEARCH METHODS

This was qualitative research, which employed a case study. Generally, qualitative research is a field of inquiry across disciplines and fields. It involves an in-depth understanding of elements and reasons that govern human behavior, thereby requiring small and focused objects are needed (Wahyuni, 2019). This research attempted to extensively analyze the company's management efforts to achieve the set standard costs. Consequently, the subsidiary of a state-owned holding company engaged in the cement industry was the object of this research.

The method employed was a field approach, where natural phenomena and conditions were observed directly at the research object (in situ) (Wahyuni, 2019). Meanwhile, data were collected via interactive interviews by asking the respondents to explain their experiences with the phenomenon (Wahyuni, 2019). Primary data were obtained from interviews, while secondary data were sourced from the analysis of internal company documents. The interviews were conducted in a semi-structured format with related parties to obtain in-depth information about the achievement of the standard cost set by the holding company. Interviews were conducted face-to-face after appointments with the respondents with company managers. Five of the seven interviewees were male, and two were female. The age range was between 30 and 50 years, and the interviews were conducted by asking 6-10 questions for 45 -75 minutes.

The interviewees were:

1. Production Planning and Control (Rendalprod) staff responsible for the technical strategy to enhance the company's production volume;

2. Cost Accounting staff at PT. XYZ responsible for achieving the company's standard cost and monitoring the costs incurred;
3. Financial Accounting staff at PT. XYZ in control of the monthly and annual financial reports as well as the accounting policies used by the company;
4. The staff of the K3-SHE section responsible for ensuring Occupational Health and Safety (K3) and the sustainability of the company's environment;
5. Environmental Controlling Officer- SHE in charge of controlling the company's environment;
6. Two operators on the production line in charge of cement production; and
7. TPM Team Leader responsible for continuous improvement in the company.

Questions asked during the interviews can be found in appendix 1.

Internal document analysis was used as the secondary data source to thoroughly understand the manufacturing process and cost structures in PT. XYZ, as well as the variance towards the standard cost. The documents needed were the 2020 annual reports of PT. XYZ and its holding company, as well as the HPP blueprint, Company Work Plan, and Budget Book (RKAP, 2021).

4. ORGANIZATION PROFILE

The research object was one of the subsidiaries (Operating Company, abbreviated Opco) of a state-owned holding company in the cement industry. According to the 2020 annual report, PT. ABC, the holding company of PT. XYZ, controls more than 50% cement market share in Indonesia. In 2020, PT. XYZ contributed to the holding's production volume by 10% and the production decreased by 16.8% compared to the cement production realization in 2019 (ABC, 2020).

PT. XYZ has five plants that produce cement using relatively similar activity processes with differences in machine capacity and energy efficiency. Figure 4 below displays the general process of converting raw materials into cement.

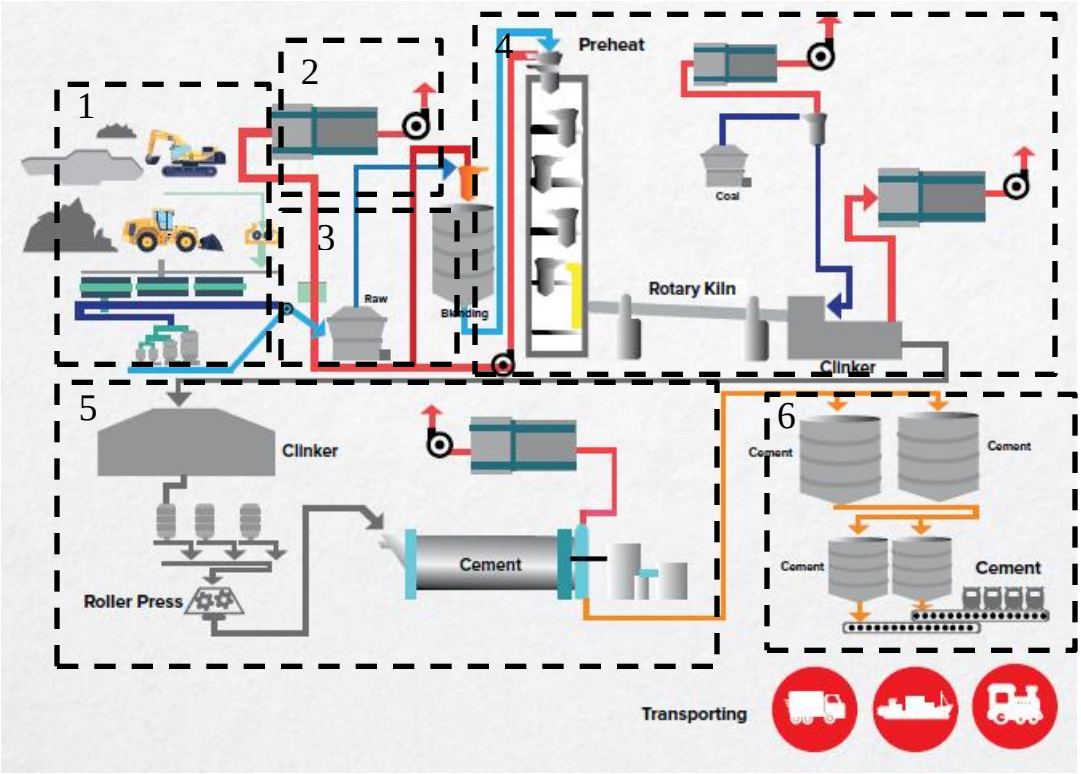

Figure 4. Cement Production Process

Source: Annual report of PT. ABC (has been reprocessed)

Based on Figure 4 and interviews with staff of cost accounting, hereafter called respondent E, the cement production process begins with grinding the main raw materials, namely limestone, clay, and iron sand. According to the Bill of Materials (BoM), the three ingredients are combined to produce a raw mix and then heated with a coal energy source to create a clinker in the form of lumps. The clinker is mixed with a third material, such as limestone, gypsum, fly ash, pozzolan, and grinding aid, which is cooled and re-mashed to produce cement for packaging or bulk transportation.

Major activities and resources used in the production process are displayed in Table 1 below. The numbers refer to Figure 4.

Table 1. Cement Production Activities at PT XYZ

No.	Activity	Resource Consumption
1	**Preparation of raw materials**	Transportation and raw material warehouse
1	**Inspection of raw material specifications**	The staff of Quality Assurance (QA), laboratories, laboratory equipment, and chemical fluids

Table 1. Cement Production Activities at PT XYZ

No.	Activity	Resource Consumption
1	**Securing coal quality**	The staff of QA and transportation.
2	**Coal refining**	Electricity for coal crusher machine.
3	**Raw mix production**	Raw materials, electricity for belt conveyors, elevators, crusher machines, and workers.
4	**Clinker Production**	Raw materials, coal, electricity, production machines, and labor.
4	**Clinker quality inspection at the production line**	The staff of *Quality Control (QC),* QC laboratory and equipment, as well as chemical fluids.
4	**Quality inspection of Clinker for exportation**	The staff of Quality Assurance (QA), laboratories, laboratory equipment, and chemical fluids.
4	**Regular maintenance of production machine**	Labor, lubricants, and regular replacement of spare parts.
5	**Third materials (pozzolan, etc.) addition**	Labor, heavy equipment, hopper for third materials.
5	**Clinker crushing to generate bulk cement products**	Labor for QC operator, production machine, electricity, third raw materials.
6	**Delivering bulk cement to the packing plant**	Operator staff, conveyor belt, power electricity, and cement.
6	**Transporting bulk cement to packing plant at site A**	Transportation fleet (specifically designed for cement trucks and trains) and labor.

Source: Interview (E, 2021)

Presently, PT. XYZ has not implemented the Activity-Based Costing (ABC) method, and most of the cost drivers are in Rupiah/Ton units. In 2020, the company reported a 1,562 workforce with a production volume of 5.4 million tons (XYZ, 2020). Standard cost determinations are stated in the RKAP, which contains the price of materials, production volume, material usage index, Capex (capital expenditure), and Opex (operational expense). This standard cost is used as a guideline by other departments, such as production

and maintenance, in performing activities for the next one-year period. A general overview of the cement production costs at PT. XYZ for 2020 is shown in Table 2 below.

Table 2. Cement Production Costs at PT. XYZ in 2020

Category	Components	RKAP 2020	Actual 2020	Variance	% variance	Description
		(1)	(2)	(2-1)	(2-1)/(1)	
Raw Materials	**Raw Materials Consumption**	**72,470**	**70,027**	**- 2,443**	**-3%**	*Favorable*
Labor	**Labor**	**50,203**	**51,782**	**1,579**	**3%**	*Unfavorable*
Manufacturing Overhead	3rd materials	3,560	1,115	- 2,445	-69%	*Favorable*
	Coal	136,422	130,639	- 5,783	-4%	*Favorable*
	Fossil fuel	9,555	7,417	- 2,138	-22%	*Favorable*
	Electricity	101,193	98,278	- 2,915	-3%	*Favorable*
	Maintenance	49,287	56,639	7,352	15%	*Unfavorable*
	Depreciation & Amortiza	32,681	49,017	16,336	50%	*Unfavorable*
	General Adm	11,765	10,359	- 1,406	-12%	*Favorable*
	Tax & Insurance	15,353	14,359	- 994	-6%	*Favorable*
	Total Manufacturing Overhead	**359,816**	**367,823**	**8,007**	**2%**	*Unfavorable*
Cost of Production (COGM)		**482,489**	**489,632**	**7,143**	**1%**	*Unfavorable*

Source: Buku RKAP 2021 (has been reprocessed)

Table 2 above shows that raw materials, electricity, and coal constituted the largest components (63%) of production costs. All components of production costs experienced favorable and unfavorable variances. The total variance per ton was only 1% of the standard cost, with the largest contributor being labor and manufacturing overhead. The largest manufacturing overhead variance was from depreciation and amortization as well as maintenance. According to the report, the variance in depreciation and amortization was caused by PSAK 73 Leases at PT. XYZ, while the maintenance variance was due to a lower production volume (XYZ, 2021).

The object of this research was interesting because PT. XYZ still uses a conventional cost system. Most of the cost drivers are production volume per area covering raw mill, clinker production, and cement mill, which is the basis used by the company. Hence, it does not allocate costs per production area.

PT. XYZ has various business processes, most of which have been taken over by the holding. As a result, Opco mostly focuses on manufacturing processes to achieve standard costs as other business processes have been transferred to the parent company. This is shown in Figure 5 below.

Figure 5. The Business Processes of PT. XYZ

Source: Annual Report PT. XYZ (2020)

Based on Figure 5 above, PT. XYZ only focuses on manufacturing and mining limestone. All *marked functions are performed by the holding company, namely raw material procurement (general manufacture and trading service), packaging, transportation from the factory to consumers, and distribution.

5. Result and Discussion

5.1 Activity-Based Management Analysis of Production Activities

5.1.1 Driver Analysis of Production Activities in PT. XYZ

Based on an interview with the operator in production plant D of PT. XYZ, the drivers of production activities are displayed in Table 3 below (J, 2021).

Table 3. The Driver of Production Activities at PT. XYZ

No.	Activity	Cost Driver
1	**Preparation of raw materials**	Production volume
1	**Inspection of raw material specifications**	Number of incoming materials
1	**Securing coal quality**	Amount of incoming raw coal

Table 3. The Driver of Production Activities at PT. XYZ

No.	Activity	Cost Driver
2	**Coal refining**	Production volume
3	**Raw mix production**	Production volume
4	**Clinker Production**	Production volume
4	**Clinker quality inspection on the production line**	Production hour
4	**Clinker quality inspection for exportation**	Number of production shift
4	**Regular maintenance of production machine**	Running hour and age of spare parts
5	**Third materials (pozzolan, etc.) addition**	Production volume
5	**Clinker crushing to produce bulk cement products**	Production volume
6	**Delivering bulk cement to the packing plant**	Production volume
6	**Transporting bulk cement to the packing plant at site A**	Production volume

Source: Author (2021)

Based on Table 3 above, the driver activity of the inspections of raw material specifications and coal guarding can be limited to sampling inspection. This can be accomplished by forming stringent contracts between the procurement section of PT. XYZ's holding company and suppliers regarding the quality of raw materials and coal delivered. As a result, the frequency of inspections can be reduced, and assessments at each arrival of materials will be avoided.

5.1.2 Activity Analysis of Production Activities PT. XYZ

The activity analysis, starting from raw material handling until the cement production at PT. XYZ, is explained in Table 4 below.

Table 4. Analysis of Production Activities at PT. XYZ

No	Activity	Value-added activities	Non-value-added activities	Consideration
1	**Preparation of raw materials**	√		Allows the next process to run.
1	**Inspection of raw material specifications**		√	Does not create state changes, only ensure quality from suppliers.
1	**Securing coal quality**		√	Does not create state changes, only ensures quality from suppliers, and has been examined by independent surveyors.
2	**Coal refining**	√		Creating changes in conditions that allow further production process.
3	**Raw mix production**	√		Creating changes in conditions that allow further production process.
4	**Clinker Production**	√		Creating changes in conditions that allow further production process.
4	**Clinker quality inspection on the production line**	√		Ensure that the next production process to produce cement mill can be carried out.
4	**Clinker quality inspection for exporting**	√		The test results determine the possibility of executing the next activity (export).

Table 4. Analysis of Production Activities at PT. XYZ

No	Activity	Value-added activities	Non-value-added activities	Consideration
4	**Regular maintenance of production machine**	√		Although it does not result in a change in conditions, this activity is needed to ensure the cement production process runs smoothly.
5	**Third materials (pozzolan, etc.) addition**	√		Creating changing conditions and enabling the next step of cement production (mill) to occur.
5	**Clinker crushing to generate bulk cement products**	√		Creating changing conditions and enabling the next step of cement production (packaging) to ensue.
6	**Delivering bulk cement to the packing plant**	√		Creating a change in conditions to allow the next step of cement packaging.
6	**Transporting bulk cement to the packing plant at site A**	√		Creating a change in conditions to facilitate the next step of cement packaging.

Source: Author (2021)

Table 4 shows that non-value-added activities, such as the inspection of raw material specifications and coal quality maintenance, can be a business process improvement step for PT. XYZ. Regarding raw materials inspection, the procurement section of the holding company can make strict contracts with suppliers regarding the quality of raw materials. This will facilitate a reduction in the inspection frequency by obviating the assessment of each raw material on arrival, while only performing sample checks. Additionally, the coal quality can be ensured by selecting to use the staff responsible for guarding or deciding on

the continued use of internal employees and external surveyors. PT. XYZ can fully rely on the existing independent surveyors and eliminate the repeated detection activity to save production costs. However, limited access to financial data encumbers the calculation of the nominal savings generated.

Other incidental non-value-added activities occur clinker with specifications below quality (raw) standards is produced, thereby necessitating reprocessing. Various factors cause the occurrence of incidental rework, such as imperfect heating, which results in increasing coal consumption. Conversely, poor quality is corrected by combining certain percentages of below standard and good quality raw mix.

Regarding the use of resources in the production process, the factory line can be divided into three sections, namely the raw mix area, clinker production, and cement production. The use of resources, such as computers and monitors, control buildings, alongside personnel in each area of production, is optimal for the department's needs. One production area involves 4 QC supervisory operators working in three shifts. The unsatisfactory use of resources is found in the factory capacity utilization because it operates below its design. However, this is closely related to the production volume allocated to PT. XYZ by the holding.

The production process has several bottlenecks due to the full capacity of the cement silo, such as a disparity between its emptying speed and the cement mill area process. This results in the absence of storage space for the cement and the eventual discontinuation of the production process.

Efforts to reduce the costs of activities in the production process include procuring cheaper alternatives of raw materials, such as replacing Natural Gypsum with Purified Gypsum and coal with a material of lower quality than the RKAP standards.

5.1.3 Performance Measurement of Production Activities at PT. XYZ

There are several performance measurements in the production activities of PT. XYZ, as displayed in Table 5 below:

Table 5. Performance Measurement of Production Activities PT. XYZ

Category	Performance Indicator	Target	Achievement
Financial	COGM	93% of the total cost	Unachieved
Operation	Ton per Day	Depends on PO	Unachieved

Process	QC parameters	Depend on parameters	Achieved

Table 5 shows that the unachieved COGM performance indicators were caused by the price and/or usage of the raw materials. Since the price was maintained by the PT. XYZ holding, the challenge was consequently related to the usage of materials. Also, another performance indicator could not be analyzed due to data limitations.

5.2 Activity-Based Management Analysis of SHE Activities at PT. XYZ

5.2.1 Driver Analysis of SHE Activities at PT. XYZ

Table 6 shows the driver activities in SHE biro based on an interview with the Safety Health and Environment staff at PT. XYZ, hereafter called K and L (K, 2021; L, 2021) are displayed in Table 6 below:

Table 6. Driver Analysis of SHE Activities at PT. XYZ

Type of Activities	Driver Activities
Health and Safety (K3 Section)	
Safety induction	Frequency of incoming visitors
Weekly health campaign	Time interval
Provision of safety facilities and infrastructure	Amount of dangerous work
Safety and firefighting training	Time interval
Field patrol	Number of operating days
K3 staff certifications	Number of K3 staff
Health webinar	Time interval.
Verification of dangerous work permit	Amount of dangerous work
Environmental Control Section	
Air ambient test	Number of production days
Water pollution test	Number of production days
Noise test	Number of production days
Dust test	Number of production days

Source: Author (2021)

Table 6 indicates that the drivers of SHE activities, particularly in the K3 section, are strongly influenced by the dangerous activities performed in the PT. XYZ. The activities in the environmental control section are strongly motivated by the number of production

days. However, the frequency of activity cannot be reduced because pollution or emissions may occur randomly and unpredictably. For example, a production machine suddenly spilled out dust exceeding the threshold regulated in Permen LK No. 19 year 2017.

5.2.2 Activity Analysis of SHE at PT. XYZ

Activities in SHE can be categorized as value-added and non-value-added, as shown in Table 7 below.

Table 7. Analysis of Activities in SHE at PT. XYZ

Type of Activities	Value-added activities	Non-value added activities	Reason
K3 Activities			
Safety induction	√		Prevent higher risks caused by company accidents.
Weekly health campaign	√		Mandatory due to government regulations.
Provision of safety facilities and infrastructure	√		Prevents higher risks due to company accidents.
Safety and firefighting training	√		Prevents higher risks due to accidents in the company.
Field patrol	√		Mandatory due to government regulations (Kepmenaker 186/1999).
K3 staff certifications	√		Prevent higher risks due to company accidents.
Health webinar	√		Mandatory due to government regulations.
Verification of dangerous work permit	√		Mandatory due to government regulations.
Environmental Control Activities			
Air ambient test	√		Mandatory due to government regulations.

Table 7. Analysis of Activities in SHE at PT. XYZ

Type of Activities	Value-added activities	Non-value added activities	Reason
Water pollution test	√		Mandatory due to government regulations.
Noise test	√		Mandatory due to government regulations.
Dust test	√		Mandatory due to government regulations.

Source: Author (2021).

Table 7 shows that all SHE activities are value-added, though a state change may not occur. Activities in K3 become value-added due to mandatory government regulations and their ability to prevent the company from higher-risk exposures due to company accidents. Therefore, all the activities in the environmental section must be performed due to mandatory government regulations.

The SHE biro functions are closely related to government regulations. Although some environmental control activities are measured by PT. XYZ, the provisions of the applicable government regulations are fulfilled by using third-party services to measure emissions periodically according to the established frequency. Regardless, the frequency of the daily testing performed internally by the company cannot be reduced. This shows that none of the activities performed by SHE can be decreased or eliminated, as this will cause PT. XYZ to face potential greater risk related to the company's operating license.

5.2.3 Performance Measurement of SHE Activities in PT. XYZ

The performance measurements of SHE activities are displayed in Table 8 below:

Table 8. Performance Measurement of SHE Activities in PT. XYZ

Category	Performance Indicator	Target	Achievement
Operation – K3	Days of fatality Days of injury	No fatality	Unachieved Fatality

Operation – Environmental	Water, air, noise, and dust parameters, as stated in government regulations.	Depends on the norms of the test	Achieved (Proper Biru in 2020)

Source: Author (2021)

The performance measurements of K3 targets are determined by the company management, while the environmental control activities are based on government regulations. Meanwhile, the non-achievement of K3 performance appraisal indicators was due to the highly stringent standards applied by PT. XYZ during the assessment. Direct work accidents are categorized as severe, supposing more than one working day is lost. In November 2021, the company recorded 4 first-aid incidents, 1 minor accident, 4 serious accidents, and 2 traffic accidents.

6. Conclusion and Discussion

The ABM approach has enabled PT. XYZ to achieve the standard cost set by its holding company through the analysis of activities in the production process. This is because some non-value-added activities occur in the production department, such as inspecting raw material specifications and maintaining coal quality. Meanwhile, there were no non-value-added activities in the SHE section because its functions were related to the continuity of the company's operations. Reducing the frequency of raw material inspection and coal maintenance can increase savings and reduce production costs. However, the value of the savings was unfortunately indeterminable due to limited data access.

There is still room for improvement in the business processes, especially in the production department. Continuous improvement is particularly needed in reducing potential bottlenecks in the final production process due to the full capacity of the cement silo. The disproportionate relationship between the speed of silo emptying and the cement mill process area results in the abrupt cessation of production due to the absence of a storage place for the produced cement. Without continuous improvement, the cement silo may overfill again in the future.

The limitations in this research include incomplete interviews of the company sections due to time restrictions, thereby preventing activity analysis per production area. Additionally, the Covid-19 pandemic caused delays in initiating the investigation due to PPKM licensing constraints on the research objects. Another limitation was the inability to measure the costs and potential savings from eliminated or reduced non-value-added activities in the production department.

Hence, the results on the business practices imply that the application of ABM can be a tool for companies to achieve the set standard costs and seek continuous improvement through the analysis of value-added and non-value-added activities. The implication for science is the relevance of the continuous improvement concept to conditions of dynamic business competition. Although there has been little progress in business technology, there is room for improvement.

The research recommended that the company re-assesses the need for the coal custody contract as the company's employees have also been assigned to implement coal quality control. Another recommendation is that the procurement division for holding PT. XYZ makes tighter contracts with suppliers to reduce or eliminate the inspection of raw material specifications because these activities do not add value to the company. Therefore, using standard raw materials and coal with appropriate moisture content will generate cost savings and reduce total production costs by eliminating non-value-added activities and decreasing the use of clinkers.

Recommendations for further research are assessing the effect of using alternative energy sources created by PT to reduce the use of coal, as its price is experiencing an upward trend. Coal is a significant component of the company's COGM, which can be suppressed by a modification of the commodity's price.

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REFERENCES

ABC, P. (2020). *Laporan Tahunan PT. ABC 2020*. Retrieved from

Berg, T., & Madsen, D. Ø. (2020). The Historical Evolution and Popularity of Activity-Based Thinking in Management Accounting. *Journal of Accounting & Organizational Change, 16 No. 3, 2020*(2020), 401-425. doi:10.1108/JAOC-03-2020-0030

Blocher, E. J., Stout, D. E., Juras, P. E., & Smith, S. (2019). *Cost Management: A Strategic Emphasis* (8th ed.): McGraw-Hill Education.

BUMN, K. (2019). *Laporan Tahunan 2019*. Retrieved from Jakarta: https://bumn.go.id/storage/report/milgz1io0eeidM26o8ymbv58z4uznahWZYFK3cJv.pdf

E, R. (2021, 27 Oktober 2021) *Gambaran Umum Biaya dan Focus Improvement di Bagian Akuntansi/Interviewer: Wina*.

Ellet, W. (2018). *The Case Study Handbook a Student's Guide* (Revised Edition ed.). Boston, Massachusetts: Harvard Business Review Press.

Gupta, M., & Galloway, K. (2003). Activity- based Costing/ Management and Its Implication for Operations Management. *Technovation, 23 (2003)*, 8. doi:10.1016/S0166-4972(01)00093-1

Hansen, D., Moven, M., Liming, & Guan. (2018). *Cornerstone of Cost Management* (4th ed.): Southwestern- Cengage Learning.

J, R. (2021, 27 Desember 2021) *Detil Aktivitas di lini Produksi PT. XYZ/Interviewer: Wina*. Pabrik PT. XYZ.

K, R. (2021, 24 Desember 2021) *Aktivitas di Pengendalian Lingkungan PT. XYZ/Interviewer: Wina*.

Kren, L. (n.d.). Using Activity-Based Management for Cost Control. *Journal of Performance Management*, 11.

L, R. (2021, 24 Desember 2021) *Aktivitas di bagian K3 PT. XYZ/Interviewer: Wina*.

Ponisciakova, O. (2020). *Innovative Management Perspective: ABM- Activity Based Management*. Paper presented at the 55th International Scientific Conference on Economic and Social Development, Baku.

Pranoto, T., & Makaliwe, W. A. (n.d.). Restrukturisasi BUMN Menjadi Holding Company.

Wahyuni, S. (2019). *Qualitative Research Method : Theory and Practice* (Vol. 3rd): Penerbit Salemba Empat.

XYZ, P. (2020). *Laporan Tahunan PT. XYZ tahun 2020*. Retrieved from

XYZ, P. (2021). *Rencana Kerja dan Anggaran Perusahaan Tahun 2021*. Akuntansi. PT. XYZ.

APPENDIX

Appendix 1. List of Interview Questions

1. The Staff of the Cost Accounting Section of PT. XYZ was asked the following questions:
   i. What is the trend of the variance between the budget and actual expenditure in the 2018-2021 RKAP?
   ii. What are the significant differences faced by PT. XYZ since sales were transferred to a mega distributor?
   iii. How high is the current product cost compared to the standard cost set by the parent company?
   iv. What strategic steps are being implemented by the company regarding the policy of transferring sales functions to mega distributors?
   v. What is the proportion of total costs between the production and support divisions?
   vi. How does the cost accounting department collaborate with the TPM department in initiating the TPM project?
   vii. Are there any obstacles to verifying the continuous improvement project executed by small group activities at the plant?

2. The Staff of K3- SHE was asked:
   i. What activities are held in the K3 section?
   ii. What are the drivers of the department's activities?
   iii. How is performance measured?
   iv. How does the cost proportion of the K3 section compare to SHE?

3. The Staff of Environment – SHE was asked:
   i. What activities are held in the environment section?
   ii. What are the drivers of the department's activities?
   iii. How is performance measured?
   iv. How does the cost proportion of the environmental section compare to SHE?

4. The Staff of Perencanaan dan Pengendalian Produksi (Rendalprod) was asked the following questions:
   i. How does the planning and production control division break down the units/quantities in the Company's Budget Work Plan (RKAP)?
   ii. What is the process of determining the clinker factor? What is the target clinker factor for 2022?

iii. What efforts are being made to reduce the clinker factor?
iv. How can resources, particularly manpower, be optimized to reduce overtime?
v. Is there a limit on allowed overtime?
vi. How can activity performance in the production department be measured?

5. The Staff of Financial Accounting was asked:
i. What is the company's policy towards inefficiently operating production lines?
ii. Is there any allowance for losses made by PT. XYZ related to the decline in the value of old factories, such as plant A?