



PERFORMANCE IMPROVEMENT STRATEGIES IN FINANCIAL, LEARNING AND GROWTH PERSPECTIVES THROUGH IMPLEMENTING THE INTEGRATION OF LEAN WITH SIX SIGMA (DMAIC) CONCEPTS IN THE PACKAGING DRINKING WATER INDUSTRY IN MAKASSAR CITY

Lamatinulu

Department of Industrial Engineering, Faculty of Industrial Technology, Universitas Muslim Indonesia,
Makassar, Jalan Urip Sumoharjo Km 05, Makassar 90231, Indonesia
E-mail: lamatinulu.ahmad@umi.ac.id

ABSTRACT

The growth of bottled drinking water is currently growing in line with the increasing needs of the community, however, in its operational activities, several problems are still found. The problems are related to the problem of activities that are not useful (waste) in the aspects of finance, learning, and growth. Based on these problems, in this study, an analysis was carried out by applying the integration of the concept of Lean and Six Sigma. The research method approach is carried out by identifying the types of activities that are not useful (waste) and analyzed by the stages Define, Measure, Improve, and Control with the abbreviation DMAIC analysis. The method of data collection was carried out by direct survey, interview, and questionnaire instrument distribution. The results of this study identify activities that are not useful (waste) in the form of findings of the amount of non-productive work time, low work motivation, low frequency of employee education and training activities, loss of sales turnover due to consumer movement to buy other brands of products, it is still found that the lowest sales volume occurs. Based on the stages of DMAIC analysis, 10 root causes and strategies of waste are found from a financial perspective, and 8 on the aspects of growth and learning.

Keywords: Performance, Lean, Six Sigma, Waste

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Address :
UripSumoharjo Km. 5 Street (Campus II UMI)
Makassar Sulawesi Selatan.

Email :
Jiem@umi.ac.id

Phone :
+6281341717729
+6281247526640

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1. Introduction

By paying attention to the problems faced by industrial companies at this time in Indonesia is regarding strategies to increase competitiveness. To increase the competitiveness of the industry, it is principally concerned with performance improvement techniques and strategies in the financial aspects, internal business processes, customers, and growth and learning. One company that is currently developing in various regions is the Bottled Drinking Water industry. Along with the development of the bottled water industry cluster, efforts are required to increase competitiveness through efforts to increase efficiency and performance. One of the areas where the bottled water industry is developing in Indonesia is the city of Makassar. One of the bottled drinking water companies that are developing today is the company PT. UKWH. The problems that concern this company are related to business problems in anticipating activities that are not useful (waste) from a financial, growth, and learning perspective.

Based on the survey results on the bottled water industry, it was found that several activities were not useful (waste) which could potentially cause wastes that could hinder the achievement of performance and productivity targets. Based on these problems, it is deemed necessary to implement an integrated method approach to minimize the potential for waste. Regarding the problem of waste that needs to be anticipated, it consists of two types, namely waste that cannot be avoided for various reasons and waste that must be reduced immediately (Gasperz, and Fontana, 2011). The conceptual approach applied to find problem-solving solutions is the concept of Lean and Six Sigma through the stages of Define, Measure, Analyze, Improve, and Control (DMAIC). Lean is a concept that is focused on eliminating useless activity, or waste (Womack, et.al, 1990). Lean can also be applied to companies related to financial problems to overcome weak aspects to achieve success (Layer and Moorman, 2014). Lean has been applied in various industrial management that focuses on reducing waste to increase added value (Hines et.al, 2004). The application of the Lean concept to the industry

is carried out with a systematic approach to identify and reduce all activities that do not add value to increased productivity (Czarnecki and Lloyd, 2004; Singh and Belokar, 2012). The application of the lean manufacturing concept can have a positive impact on financial performance at industrial companies (Alaaraj and Bakri, 2020) and can play a role in eliminating waste in the production process, reducing costs, and increasing the value of company performance (Durakovic et al., 2018). To prevent the potential for errors that can result in waste, it can be done by applying the Six Sigma methodology approach. The conceptual approach to this method can function more efficiently so that companies can reduce or prevent process errors (Pande, Peter S, et.al., (2000). To formulate and implement performance improvement strategies through preventing activities that are not useful (waste), then a performance improvement strategy analysis can be applied through the Six Sigma DMAIC concept methodology approach (Carreira, and Trudell, 2006). By paying attention to the important role of Lean and Six Sigma concepts for an industrial company, these two concepts can be integrated (Lamatinulu, 2016). This is supported by the results of research by Chakraborty et., all. (2013) which explains that Lean Six Sigma can be applied easily in the business fields of production, service, marketing, procurement, and sales to reduce time, reduce costs, increasing profits, improve quality and customer satisfaction.

Based on the problems in the bottled water industry and by taking into account the advantages of the Lean and Six Sigma concepts, this research applies a research stage with the Lean and Six Sigma integration approach. Through the application of this method, the waste identification stage is applied based on the Lean concept and the Six Sigma stage which includes the stages of defining, measuring, analyzing the causes of waste, formulating improvement strategies, and determining techniques or control methods. This research is focused on the formulation and determination of performance improvement strategies from a financial, growth, and learning perspective in the bottled water industry. In the financial perspective, it

is oriented towards performance benchmarks such as the level of growth in income or sales and maximizing cash flow, while in the learning and growth perspective the performance benchmarks used are the role of capability, motivation, and empowerment of human resources in supporting company performance and productivity. In formulating and determining performance improvement strategies, the DMAIC stage is applied to find the root causes of waste, waste improvement strategies from a financial perspective and a learning and growth perspective.

2. Research Methods

This research was conducted to determine the formulation of a strategy to improve the performance of a financial perspective and learning & development in bottled water companies PT. UKWH in Makassar. Data collection methods in this research activity are direct surveys to industrial sites, interviews, questionnaires. The data collected is oriented towards a financial perspective and a learning and growth perspective. The initial stage of this research activity is to identify activities that do not add value (waste) related to a financial perspective and a learning and growth perspective. After the waste identification has been carried out, the next step is to apply the Six Sigma methodology (DMAIC) stages. In the definition stage, it is carried out by defining the activity of waste, in the measure of resistance testing and rationalization of the stages of measuring the level of waste, in the analysis stage it is carried out by analyzing the level of waste in each process to find the root of the problem, at the repair stage a repair strategy is determined based on the root problem of waste and the control stage carried out by designing the control system mechanism to implement a strategy for improvement methods to achieve performance targets. The analysis scheme for the integration of Lean and Six Sigma concepts in determining a complete performance improvement strategy is shown in Figure 1.

Figure 1 shows the initial stages of research starting with the application of the Lean concept with preliminary survey activities, interviews, and distributing research

instruments in the form of questionnaires to identify the types of activities that do not add value or waste. The results of waste identification from a financial and learning & growth perspective were analyzed using the six sigma stage (DMAIC).

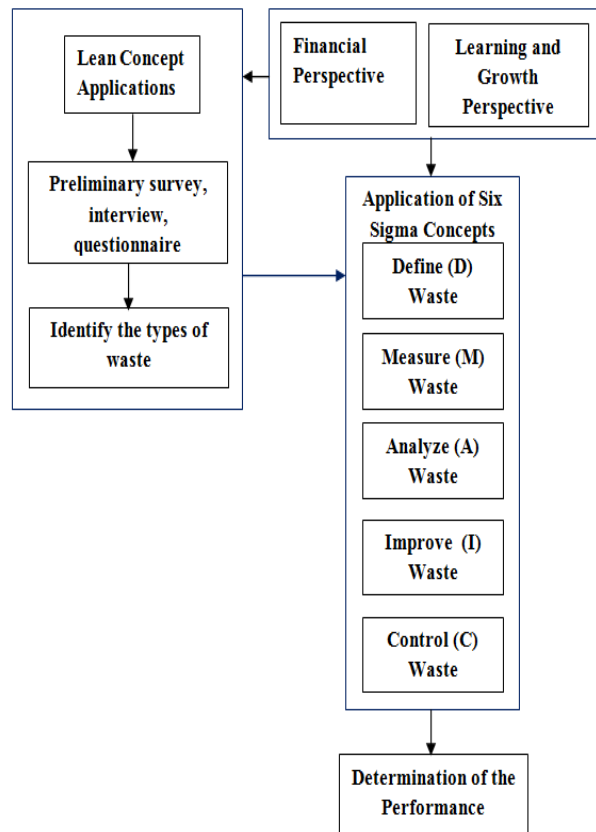


Figure 1: Stages of research analysis

3. Results and Discussion

By applying the Lean concept approach in identifying the types of activities that are not useful (waste) in the bottled water industry of PT. UKWH, the Six Sigma analysis stage approach is carried out to define waste, measure waste, analyze waste, repair waste, and control waste. The stages of the Six Sigma methodology can be described as follows:

3.1 Stages of Definition

At this stage, conditions and events found that have the potential to trigger activities that do not add value are defined (waste) are carried out. The results of the waste defining stage are made based on the consideration of the Lean concept approach as shown in Table 1.

Table 1. Stages of defining waste

Perspective	Definition of the results of identification of potential waste
Financial	There is an opportunity for the company to lose sales turnover, due to the impact of the delivery system which has the potential to cause consumers to move to buy other products.
	Based on sales volume data, the lowest average sales volume is 214 gallons and the highest sales volume is 503 gallons, this shows a fairly large gap.
Learning and growth	Employee commitment and discipline in utilizing working time is still low because there are still a lot of non-productive working hours
	Employee work motivation is still not optimal, because the

	company has not implemented a reward and punishment system based on work performance considerations.
	Employee management skills and abilities are still inadequate, due to the low frequency of education and training activities that are carried out periodically.

3.2 Measurement Stages

After some unfavorable activities (waste) are defined based on financial, learning and growth perspectives, the next step is to test and rationalize the stages of measuring the level of waste in each process as shown in Table 2. At this stage, an analysis of the estimated sales turnover loss per day of industry PT. by dividing the number of waiting days (2 days) by the number of selling days (24 days), then multiplying it by the average number of sales per day (475), and the selling price (Rp. 6,000) so that the loss of sales value is Rp. 236,000 per day.

Table 2. Measuring wasteful & unprofitable activities

Perspective	Measuring wasteful and unprofitable activities (lean concept)
Financial	Estimated loss of sales turnover per day of PT. UKWH $SL = \frac{2 \text{ days of waiting}}{24 \text{ day on sale}} \times \text{average sales per day}$ $SL = \frac{2 \text{ days of waiting}}{24 \text{ day on sale}} \times 475 \times \text{Rp. 6000} = \text{Rp. 236,000 per day}$
	Percentage of opportunities for decreased sales turnover $Pp = \frac{rph - rpl}{rph} \times 100\%$ $Pp = \frac{503 - 214}{503} \times 100\% = 57,45$ <p>Information: Pp = decrease in sales rph = highest average sales rpl = lowest average sales</p>
Learning and growth	Employee commitment and discipline in utilizing working time is still low because there are still a lot of non-productive working hours, around 3.5/8 hours = 43.75%
	Achievement of work targets is low because employee motivation is still low, because the company has not implemented a reward and punishment system based on work performance considerations..
	Employee performance and productivity are still not optimal due to the inadequate skills and abilities of employee management, due to the low frequency of regular

education and training activities.

3.3 Stages of Analyzing

After several unfavorable activities and conditions (waste) are measured both quantitatively and qualitatively based on a financial and learning & growth perspective, the next step is to analyze the level of waste in each process to find the root of the problem in wasteful activities.

3.3.1 Analysis of Financial Perspectives

The analysis step with a fishbone diagram is to test and find the root of the problem in the decline in sales turnover which can have an impact on the performance of a financial perspective as shown in Figure 2.

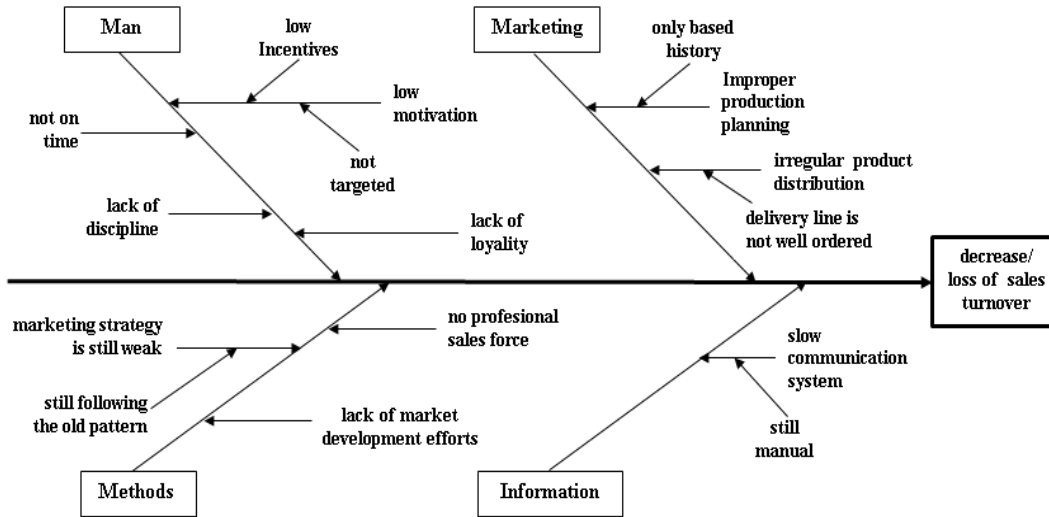


Figure 2. Analysis of the causes of waste from a financial perspective

Based on the results of the analysis with the fishbone diagram in Figure 2, it is found that the root causes of the potential causes of decline and loss of sales turnover are: 1). the workforce is less disciplined, 2). service is not on time, 3). there is no sales target setting, 4). low sales force incentives, 5). Marketing management is still weak because it still uses the old pattern and has not been supported by professional production planning because it is st

routes that are not well ordered, 8). The communication and information system for product delivery is still slow because it still uses a manual system.

3.3.2, Analysis of Learning and Growth Perspectives

The analysis step with a fishbone diagram is to test and find the root of the problem of

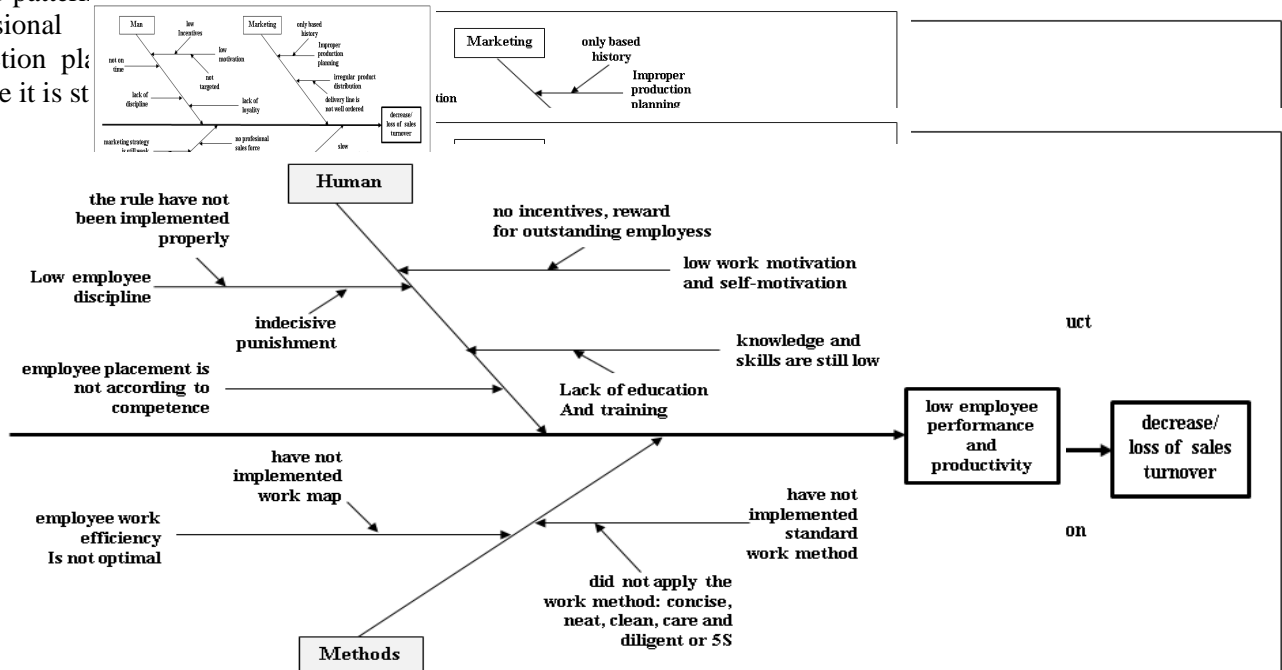


Figure 3. Analysis of the causes of waste from a learning and growth perspective

Based on the results of the analysis with the fishbone diagram in Figure 3, it is found that the root causes of the potential causes of decreased performance and productivity are: 1). the workforce is less disciplined, 2). working rules are not implemented properly, 3). weak implementation of a punishment system, 4). Employment placement is not based on competence, 5). Work motivation and self-development of employees are low because they are not supported by a system of providing incentives and rewards based on work performance. 6) Knowledge and skills of employees are still low due to lack of education and training. Employee work efficiency is not optimal because it has not implemented work maps. Has not implemented a standard work method system because the company has not applied the short, tidy, clean, neat, and diligent work method approach.

3.4 Stages of Improvement (Improved)

After several unprofitable activities (waste) were analyzed both quantitatively and qualitatively based on financial and learning & growth perspectives, the next step was to establish a performance improvement strategy to eliminate potential causes of waste in the bottled water industry of PT. UKWH in Makassar city.

3.4.1 Stages of determining performance improvement strategies from a financial perspective

After the analysis step of determining the root cause of the decline in sales turnover which can have an impact on the performance of the financial perspective as shown in Figure 2, it is followed up by determining the improvement strategy as shown in Table 3.

Table 3: Determination of the strategy for improving the performance of waste prevention from a financial perspective

The root of the problem		Performance improvement strategy	
1	Human Resources Lack of discipline	1	Increased employee discipline
2	Service is not on time	2	Product delivery service improvements
3	No targets are given to marketers	3	Provide sales targets to marketers
4	Low incentives for sales force	4	Performance-based employee incentive improvements
5	Lack of effort to develop and expand market sharer	5	Increase in market share expansion efforts
6	Marketing management is still weak, because it still uses the old pattern	6	Performance management based marketing system design
7	There are no professional marketing Human Resources		Increased professionalism of marketers
8	Production planning methods are not right because they are still based on history	8	Determination of the right production planning
9	Delivery route is not well ordered	9	Arranging delivery routes in order to support a fast and punctual service system
10	The communication and information delivery system is still slow because it is still a manual system	10	Improved customer service information and communication systems

3.4.2 Stages of determining the performance improvement strategy from a financial perspective

After the analysis step of determining the root cause of the decline in employee performance

and productivity which can have an impact on the performance of the learning and growth perspective as shown in Figure 3, it is followed up by determining the improvement strategy as shown in Table 4.

Table 4: Determination of the strategy for improving the performance of waste prevention from a learning and growth perspective

The root of the problem		Performance improvement strategy	
1	Employees lack discipline because the punishment system is not yet clear and firm	1	Clarify and reinforce the implementation of a punishment system for employees
2	Work rules have not been implemented properly	2	Procurement and implementation of work rules
3	Low motivation because there is no incentive for high-performing employees	3	Determination of standardization of incentives for employees who excel
4	There is no standard reward system for employees	4	Establish a standard reward system that can provide welfare guarantees
5	Employee placement is not based on competence	5	Employee recruitment and placement according to their competence
6	Low skills and skills because they rarely follow education and training	6	Provide education and training to employees regularly
7	Employee work efficiency is not optimal because it does not apply flexible work methods	7	Implement an efficient work system by applying flexible work methods
8	Have not applied standard work methods such as concise, neat, clean, neat, and diligent	8	Applying a work method with a concise, neat, clean, neat and diligent approach.

3.5 Stages of Control

With the stipulation of improved steps as shown in Table 3 and Table 4, the next stage is to design a supervisory system mechanism to implement improvement

methods that will be carried out to achieve improvement targets to prevent all activities that do not provide benefits (waste) from a financial and learning and growth perspective as shown in Table 5.

Table 5. Mechanism of control of steps to improve financial perspective and learning & growth.

Perspective	Control mechanism
Financial	Supervise employee discipline towards the work rules that have been made
	Supervision of product delivery service improvements and achievement of sales targets for salesforce
	Monitoring and monitoring of employee performance and an incentive system
	Supervision of the implementation of the performance-based marketing system design and evaluation of the professionalism of marketers
	Control of production planning and evaluation of the arrangement of delivery lines that support timely service
Learning, and growth	Conducting disciplinary supervision and obedience to work rules as a basis for giving rewards and punishments
	Supervision of the implementation of standardization of incentives and rewards for outstanding employees

	Evaluate and supervise recruitment and placement of employees based on competency and standard selection and acceptance criteria
	Conduct periodic evaluations and controls on the improvement of skills and skills of employees through education and training activities
	Carry out consistent control over the application of efficient and effective work methods

Based on the stages of analysis results using the Six Sigma DMAIC methodology, a fundamental solution is found to prevent activities that are not value-added (waste). The main solution is to increase employee discipline in supporting value-added activities to improve performance from a financial and learning & growth perspective. Employee work discipline is very important because it can have an impact on the performance of employees of company organizations (Sarwani, 2016; Jeffrey, and Soleman, 2017; Simatupang and Saroyeni, 2018; Tentama, et al., 2020). Improving product delivery services through structuring the right product delivery lines is an alternative solution that needs to be applied to improve the performance of the company's financial perspective. Improvements in product delivery to the industry can be done with a lean concept approach through reduced waiting time and support for proper production planning (Urs S, et al. all, 2014). Through timely product delivery services, it can increase customer satisfaction and have an impact on increasing sales volume (Ramdhani, et al., 2017; Peng and Lu, 2017). An increase in sales volume can affect the performance of a financial perspective because it can increase the income of industrial companies. The strategy for improving the financial perspective of the bottled water industry's performance PT. UKWH is also related to managing a professional marketing system to expand market share. The implementation of the right marketing strategy system has an impact on increasing the company's revenue, profit, and financial performance (Adewale, et al., 2013; Abiodun, and Kolade, 2020). To improve financial performance, it must also be supported by improvements in customer service information and communication systems, because good communication and information services can improve the organizational performance of industrial companies (Shonubi, and Akintaro, 2016;

Chouchane, and Louati, 2018; Pich, and Sardjono, 2020).

Particularly from the learning and growth perspective, the performance improvement strategy is focused on increasing employee competence through regular education and training activities. Employee training can improve discipline, work skills that can prevent waste of work time to increase job satisfaction, performance, and productivity (Boadu, et al., 2014; Onyango and Wanyoike, 2014; Mahadevan and Yap, 2019). The strategy for improving performance from the learning and growth perspective is the provision of rewards for employees who excel and the application of punishment to prevent activities that are not useful (waste). Giving rewards to employees can have an impact on increasing work motivation which can improve employee performance (Salah, 2016; Panekenan, et all, 2019; Putra and Damayanti, 2020). In preventing waste activities, a system of punishing for employees who do not comply with the rules of work consistently is needed, because this can also have a positive impact on improving employee performance (Novarini and Imbayani, 2019; Putra and Damayanti, 2020). Another strategy to prevent waste from occurring from a learning and growth perspective is the application of a working system through the application of appropriate

and flexible work methods that can improve performance (Altindag and Sille, 2014; Davidescu, et all, 2020). The design of an efficient and effective work method as a measure to prevent waste can improve company performance and productivity (Sunday, 2015).

4. Conclusion

Based on the results of data collection, data processing, and discussion analysis, it can be concluded that the Lean and Six Sigma (DMAIC) concept approach can be used to establish a performance improvement strategy

and a monitoring system for the implementation of a performance improvement strategy from a financial perspective and a learning & growth perspective. In the analysis of this research, it is found that performance improvement strategies from a financial perspective include the application of employee work discipline, customer service improvement, sales target setting, market share expansion, fast and timely product delivery line arrangement, and improvement of information and communication systems for marketing services, and support from the professional sales force. The results of the analysis also found a performance improvement strategy from the perspective of learning and development which essentially includes the application of discipline, reward and punishment systems, the implementation of regular employee education, and training and the application of flexible, efficient, and effective systems and work methods. To realize the implementation of the improvement strategy, a control system is needed to improve the performance from a financial perspective as well as a learning and development perspective.

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