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AN APPLICATION FOR REDUCTION OF THE NON-VALUE ACTIVITIES BY KAIZEN COSTING METHOD IN THE KENTAUF TRANSFORMER PLANT*

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Abstract. Businesses that plan to protect and maintain their assets in increasingly competitive global environment focus on activities that do not create value and reduce the cost of these activities to produce high quality at low cost. Kaizen costing method plays an important role in reducing and eliminating these activities. The main purpose of application in this context is to determine whether the Kaizen costing method has an effect on reducing or eliminating production losses as an activity that does not create value in a transformer producing enterprise. In addition, the effect of Kaizen costing method on production costs was researched in the study, thus saving costs. The effect of Kaizen costing method has been applied in Kentav Transformer Plant with a semi-structured interview method in order to achieve these goals and objectives, that is, in reducing the activities that do not create value in the production process and saving in production costs. In the research, only the losses in the production process are focused, and activities that do not create value other than production losses are excluded. As a result of the research, it can be said that Kaizen costing method has a positive effect in reducing production losses (defective products, faulty products, wastage and residuum) and saving in production costs.

Keywords: Non-value Activities; Production Loss; Cost Reduction; Kaizen Costing

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1. Introduction

Today, the changes and developments that occurred both economically and technologically increased the competition even more. In an increasingly competitive environment, the attention of businesses is focused on activities that do not create value and the costs of these activities. Activities that do not create value are unnecessary activities for the business and the customer at the output level and cause additional cost burdens (Dhingra et al., 2019: 792). Activities that do not create value can move businesses away from cost leadership by increasing costs in a global competitive environment. Cost leadership is to produce the same product at a lower cost than competitors without sacrificing quality. Activities that do not create value in businesses cause cost increase and profit losses. These activities that cause an increase in costs should be reduced or eliminated without affecting the product quality and market value. The activities that do not create value in businesses and their costs are becoming more and more important in competing with competitors, and their interest in cost management has increased. Because cost management is not only limited to reducing costs, but also includes other activities across the enterprise to increase profitability (Collatto et al., 2016: 816). Reducing losses in resource use and increasing their effectiveness, making product costs easier to calculate and making healthier decisions in a global competitive environment facilitates cost management (Sowmya et al., 2020: 8284). In order to achieve success in cost management, activities that do not create value should have been focused.

In this study, the effect of Kaizen costing in reducing production losses as the activity that does not create value for producing transformers was researched. The study focuses on production losses as an activity that does not create value. First of all the summary information about non-value activities, production losses and cost management of non-value activities is given in this study. Then, by giving a literature about Kaizen costing, the aim and main components of Kaizen costing are tried to be explained. Finally, the effect of Kaizen costing system on reducing production losses from activities that do not create value was examined by a semi-structured interview technique in a company producing transformers belonging to the private sector and the results obtained were tried to be evaluated.

2. Conceptual Framework

Activities that do not create value can be seen in all managing processes of the business. For this, in any business activity, it should be focused on target activities. If the value-free activity is unnecessary for the business or does not serve the business purpose, it should be eliminated altogether (Kustono et al., 2020: 2215). As an example of activities that do not create value in a business (Shou et al., 2020: 62); unnecessary materials and packaging, poor quality, loss of production, inventory, transportation, control and unproductive working hours can be shown. In the production process, excessive material usage, causing production losses by not producing the desired quality, and unnecessary stocks, lack of control and unproductive waste of time are the activities of the companies that negatively affect the global competitive environment. The most important element that does not create value for the product produced in the production process is waste. Ohno, one of the founders of the full-time production system, defines waste as follows: Defining it as everything that creates no value on the product purchased by the customer and causes an increase in cost (Monden, 2011: 19). Elimination of waste requires reducing or eliminating all activities that do not add value to the manufactured product. It is necessary to avoid any kind of negativity that causes waste, irregularity without overloading workers and equipment during the production process (Kustono et al., 2020: 2216). Activities that do not create value also result from errors in time management and quality system. Production losses in the production process should be carefully examined, the production process should be restructured and the processing time should be further activated to eliminate

activities that do not create value. In addition, non-value-added activity times such as inspection time, transfer time and waiting time should be reduced or eliminated (Shou et al., 2020: 63).

It should not be overlooked that production losses are an important problem that occupies businesses in the global competitive environment. Production losses are the negativities that arise as a result of inadequate machine-equipment, energy, materials, labor use, and management errors in production. These drawbacks reduce profitability and productivity by increasing costs and poor quality. Production losses can be classified according to their occurrence time and qualities. Production losses according to the time of occurrence; It can be divided into three before production, during production and after production. Production losses according to their qualities; can be divided into four as defective products, faulty products, wastage and residuum (Yan et al., 2020: 55). Production losses are revealed at quality control points. Quality checks can be carried out at the beginning, middle and end of production process. With these controls, it is identified whether or not there are predetermined standards and features. While products that meet the standards that pass the quality control stage at the end of production are taken into stock, those who cannot pass the quality control stage are called defective products and faulty products (Ighravwe and Oke, 2020: 114). The defective product can be sold at normal sales price in accordance with the standards by additional processing. The defective product, on the other hand, cannot be converted into a standard product by additional processing and cannot be sold at the normal sales price of a product that complies with the standards. Parts that have a measurable sales value, such as debris, crumbs, etc. in direct materials that enter the production process, are called remainder. The leftovers can participate in the reproduction process or they can be sold at a very low price. Losses that do not have a measurable sales value due to various reasons such as shrinkage, evaporation, and loss from direct materials entering the production process are called losses. In terms of quality, waste can be divided into two as normal and abnormal. While normal waste can not be prevented, abnormal waste can be prevented as a result of increased efficiency. In summary, production losses in businesses negatively affect value formation and competitiveness by causing an increase in quality, cost and dissatisfaction and a decrease in profitability. In order to get rid of this negative effect, activities that do not create value and their costs must be managed very well.

3. Theoretical Framework

Elimination of activities that do not create value is important in terms of achieving sustainable profit purpose in the global competitive environment. These activities lead to decreased profits, higher costs and unnecessary resource consumption. It is inevitable to manage the costs of these activities to the business. In order to manage the activities costs that do not create value, it is first necessary to get rid of the activities negative effects that do not create value in the business. The way to do this is through cost management, which enables the use of business resources more effectively and rationally. Cost management is the effort to provide the necessary information for the efficient use of resources in the products production that can compete in international markets in terms of time, cost, quality and functionality, thereby maximizing the profit of the enterprise and minimizing the costs (Monden, 2016: 67). The objectives of cost management include making accurate product costing, performing product life time performance evaluation, evaluating success, understanding and evaluating processes correctly, controlling costs and helping to implement organizational strategies (Monden, 2016: 68). To put it briefly, cost management supports efforts to eliminate costs that do not create value and to continuously improve them. The costs of activities that do not create value are the costs that do not contribute to this process in terms of product value. As an example of the costs associated with activities not creating value unnecessary stock keeping, production losses, repairing defective production, spare time labor due to various production failures, quality problems can give non-value activity time (Kustono et al., 2020: 2217).

Kaizen costing system, which requires continuous improvement, plays an important role in reducing and eliminating activities that do not create value. Kaizen is a Japanese word that means getting better, improvement, and continuous improvement. It requires the continuous improvement of the work and processes in all areas of life (Monden, 2011: 20). Kaizen costing first emerged as a method used by auto manufacturers in Japan to reduce their production costs (Monden, 2016: 69). In this costing, firstly losses are identified and eliminated for cost reduction (Rof, 2011: 105). Kaizen costing is a cost management technique that is used to reduce costs during the production phase of the product's life cycle and takes periodic profitability targets into account (Ihrig et al., 2017: 225). In other words, Kaizen costing is one of the cost management techniques that focus on continuously reducing costs with all employees' participation during the production (Bozdemir, 2018: 4). Considering the definitions and theories listed above, it is understood that Kaizen costing has two main purposes (Macpherson et al., 2015: 5):

- Applying the Kaizen philosophy to the production process to achieve cost reduction
- To avoid waste by extracting the activities that does not create value from the production processes.

However, it is seen that there are five main components of Kaizen costing system. They are: Full Time Production, Work Tools, Total Productive Maintenance, and Suggestion System Poke Yoke (Macpherson et al., 2015: 5-7).

4. Literature Review

Chen (2015), in his study comparing traditional and Kaizen costing, aims to reach the cost performance standards where traditional methods adopt the understanding of cost control system, stagnation of production conditions and cost. It is stated that Kaizen costing adopts a cost reduction system and assumes continuous improvement in production. The purpose of Kaizen costing is to reach cost reduction targets. In the research carried out by Ihrig et al. (2017), 86% of the enterprises use activity-based costing system, 7% use product life cycle costing and 1% Kaizen costing system. Normal and abnormal wastage costs are taken into consideration in the majority of enterprises, and wastage costs are mostly attributed to the products. Bozdemir and Orhan (2012) conducted a survey on the applicability of Kaizen costing method in the main and sub-industry companies in the Turkish automotive industry. The companies participating in the research responded to Kaizen Costing Method with a rate of 47.0% and another method similar to Kaizen Costing under a different name in our enterprise and with a rate of 13.7% is a method applied in the production stage in our enterprise. Hacıhasanoğlu (2014) has achieved a 29% improvement in the production amount with the Kaizen activities carried out in the enterprise operating in Kayseri in order to apply the Kaizen costing method in the furniture industry and create awareness in this regard. Rodriguez and Lopez (2012), conducted a survey with 87 of 154 manufacturing companies registered Activity Based Costing, Target Costing, Kaizen Costing, Quality Cost System, Just In Time Production Environment Costing, Product Life Period Costing systems and the companies that apply cost management systems to determine which purposes they apply, and why businesses that do not apply, determine from 154 registered companies in the Stock Exchange. While the companies that apply Kaizen Costing apply with the aim of decreasing the total processing time, constantly control the production costs and reduce the production costs with the most continuous improvement efforts, the companies that do not apply Kaizen Costing do not apply due to the lack of sufficient knowledge about the application. Okutmuş and Ergul (2015) conducted field research in a five-star hotel company in Antalya regarding target costing, value analysis and Kaizen costing methods. In Kaizen costing application, it was found that the accommodation company should make a cost minimization of 1.210.000 TL in total, in order to reach the target costs, in other words, Kaizen cost target determined in order to achieve the target sales price and target sales volume in 2014. In addition, in the study, it is suggested that in the use of these methods, they should recruit and / or train qualified personnel who will apply these methods correctly. Collatto and others (2016) aimed to identify lean accounting practices consistent with strategic cost management in companies in the industrial sector working with lean manufacturing. As a result, they proved that the companies

surveyed continue to use traditional costing methods. Finally, they also proved that companies are more involved in lean manufacturing practices than lean accounting, filling a gap in the literature on the subject. Gül and Gül (2017), in their study on new methods of reducing costs in industrial food establishments, investigated what measures enterprises take to reduce costs. In order to increase the profitability of the enterprises, the most important ways they use are to reduce raw material costs and improve the current market. But to increase profitability, increasing quality, increasing price and reducing labor costs are not considered as a tool. Santos and others (2018) focused on the analysis of quality costs in the automotive industry, including a bus manufacturing company. Its main purpose is to improve the quality costs indicator by providing tools to assess the cost of failure in the manufacturing process. Kaizen-lean principles were used as methodology. Kurebwa and Mushiri's research (2019) includes the design and simulation of an integrated steering system for Sport Utility Vehicles for Toyota. In keeping with the spirit of Kaizen, in this article, they explored possible improvements in the transportation capabilities of sport utility vehicles in an energy-efficient way. As a result, it has reached three key conclusions: improved vehicle use, sustainable steering system development and autonomous driving. If a company wants to provide control and efficiency in Kaizen costing, deviation analyzes should be made for continuous improvement. If the expected savings are achieved, there is no deviation. Deviation is positive if higher savings than expected (Dhingra et al., 2019: 795).

To put it briefly, Kaizen can be considered as an effective tool for eliminating activities that do not create value in the production process in enterprises. Because this costing can be focused on the cost of direct first substance and material, direct labor and general production, as well as only one of them. Kaizen costing is a cost reduction method that helps to eliminate activities that do not add value to the product in the production process by continuous improvement.

5. Application

5.1. Purpose of the Research

The main purpose of this application is to determine whether Kaizen costing method has an effect on reducing or eliminating production losses as an activity that does not create value in a company producing transformers. In addition, by investigating the effect of Kaizen costing on production costs, it is aimed to save costs. In order to realize these goals and targets, the production losses were focused from the activities that did not create value in the production process, and other activities that did not create value were excluded.

5.2. Scope of the Research

Within the scope of the research, the effect of Kaizen costing method applied on production costs was carried out in JSC "Kentav Transformer Plant". JSC "Kentav Transformer Plant" AŞ is one of the important organizations of the Kazakhstan industry sector. Here, focusing on production losses from activities that do not create value in the production process, other activities that do not create value are excluded. The reason for the industrial sector to be considered within the scope of the study is the importance of the industrial sector for both the Kazakhstan economy and Central Asia. In the selection of this enterprise in the industry sector it is very important that business management is open to change and innovation. In addition, their interest in both of accounting information system and the provision of the information needed the emphasis placed on institutionalization as the first private transformer-producing business was effective. Therefore, only the enterprise operating in the production branch has been selected for the purpose of the application in the research and it has been included in the application.

5.3. Information About the Sample Business

JSC “Kantau Transformer Plant” (hereinafter– JSC “KTP”) is known as the leading Kazakhstan producer of the transformer equipment of wide application delivered for all branches of economy, including power industry, metallurgy, mechanical engineering, transport, oil and gas complex, housing and communal sector. JSC “KTP” was founded in 1959. Since 2005 JSC “KTP” is a structural subdivision of the company “Alageum Group” created to unite several stably developing enterprises in order to promote high-quality electrical equipment in the CIS markets. Today JSC “KTP” occupies a leading position on the market of Kazakhstan for the supply of transformers voltage 6-10 kV with a market share of more than 60%.

For last years, the list of plant production reached more than 400 names. The main strategy of JSC “KTP” is delivery to the market of the best electro technical production conforming to requirements of consumers for quality, the price, delivery conditions and the provided service. Today, the plant is rightfully the leader of domestic electrical engineering, a leading manufacturer of transformer equipment. The equipment with the JSC “KTP” brand reliably works in all territory of the CIS and Central Asia. JSC “KTP” in the course of modernization was rid of “loose” production equipment of the USSR and switched to the latest high-tech equipment of leading Western and European companies, which are considered as one of the best in the world. The share of local content in the manufacture of equipment is 85%. The recommended period of technical operation of transformers is 25 years, but in fact, with proper operation and timely maintenance, the transformer operates uninterruptedly for 40-50 years (<https://alageum.com/en/predpriyatiya/ao-ktz>).

This enterprise is one of the first private sector enterprises of Kazakhstan in the industrial sector and annual sales revenue is around 22.76 billion tenge with 2019 data. According to data captured December 2019, 1 252 personnel are employed in 2 shifts. While many private sector enterprises terminate their activities until 2019, this business continues to grow. In this enterprise, production costs are calculated according to the full cost method in terms of scope. In this calculation, actual figures are used, and in this enterprise, the costs are distributed based on volume, and the stage cost method is applied according to the production technique (shape).

5.4. Research Methodology

Within the scope of the research, in order to get ideas about the subject, in-depth interview techniques were selected from qualitative research, which is a rich data collection management. The basic method used in the realization of the study was carried out using semi-structured interviews with the relevant managers and employees of the business. In this semi-structured interview as manager; 19 managers were interviewed such as factory manager, raw material procurement manager, business manager, personnel manager, purchasing manager, accounting manager, production manager and logistics-distribution manager. Also regarding the transformer production process, 30 people responsible for raw material purchasing and analysis, holding, pressing (curling), dyeing, drying, classification, packaging, transportation, laboratory and technical works were interviewed. The in-depth interview took 40 minutes with the factory manager, about 30 minutes with other managers and an average of 20 minutes with each employee. Interviews were carried out in December 2019. In addition, a questionnaire was applied to all managers and other personnel in the company and other employees. Due to inconsistencies and errors in the answers, some questionnaires were eliminated and 249 questionnaires were taken into consideration in the study.

Thanks to these interviews and surveys, answers to the questions were sought and the opportunity to access new information was obtained in reducing Kaizen costing activities that do not create value. In addition, the stages in the production process are observed exactly. In the study, it was preferred to collect data from the company’s annual reports, internal documents, industry reports and other studies.

6. Findings and Evaluation

Data related to managers, unit officers and employees participating in the interview and survey study are shown in Table 1. According to Table 1, 5 of the participants are the top managers, 14 - factory managers, 30 - unit or department officers and the remaining 200 are other employees. The important thing in this table is that 20% (49 people) of our respondents are managers and people who work responsibly. Here, it is understood that all of the managers related to Kaizen costing have detailed information, while 67% of the employees in the production process have sufficient information and 33% have general knowledge. In addition, all of the interviewees have seen the performance of the machines in the facility sufficiently and stated that the operation is absolutely innovative, otherwise it will not be possible to survive in a violent competition environment and continuity can not be achieved.

Table 1. Positions of interview participators

Positions	Number	%
Senior Managers	5	2,0
Plant Managers	14	6,0
Unit Officers	30	12,0
Other workers	200	80,0
Total	249	100

Defective product and wastage occur as production losses in the sample enterprise. It is not taken into account because the defective product is small enough to be said to be absent. Production losses in the sample business are shown in Table 2 below and the level of loss in the business is shown in Table 3. Total production consists of defective and non-defective products totals. Waste and waste is 14% of the total production. Production losses in the enterprise are within normal limits. The share of work teams is important in the absence of a defective product. The most important reason for the defective product to occur is power outages caused by outside the enterprise. Waste is in the process of purchasing, holding and transporting raw materials and in production. Waste amount can be considered normal considering the industry sector. It is an important problem that waste in the enterprise is not used in another production process.

Table 2. Production Losses of Sample Enterprise by Years

Production Losses*	2015	2016	2017	2018	2019
Defective Products	1 348,75	1 468,60	1 593,00	1 728,00	1 934,60
Faulty Production	-	-	-	-	-
Wastage	1 926,78	2 098,00	2 275,71	2 468,57	2 763,71
Non-Defective Products	12 138,75	13 217,40	14 337,00	15 552,00	17 411,40
Total Products	13 487,50	14 686,00	15 930,00	17 280,00	19 346,00
*million tenge					

According to Table 3, equipment inefficiencies in the sample enterprise come to the median with a rate of 39.0%, labor inefficiencies with a rate of 36.5%, material and energy losses with a rate of 31.7%. It is not possible for the enterprise to reach the target cost with these losses during the production phase. It is possible to prevent mistakes and defects that cannot be foreseen in every business. In this case, the implementation of the Poka Yoke system,

which is the main component of Kaizen Costing, is inevitable. In this way, resource and usage planning can be done correctly. The production process will contribute to the reduction of activities that do not add value to the relevant planning, practices, controls and necessary measures.

Table 3. Level of losses occurring in enterprise

Losses Occurred	Allways		In General		Sometimes		Rarely		Never		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Equipment inefficiencies	8	32,0	39	15,7	97	39,0	47	18,9	58	23,3	249	100
Labor inefficiencies	13	5,2	39	15,7	91	36,5	65	26,1	41	16,5	249	100
Material and energy losses	12	4,8	44	17,7	79	31,7	69	27,7	45	18,1	249	100

In Table 4, production costs of the sample enterprise by years are shown in detail. All of the interviewees stated that saving is inevitable in every environment where waste. They stated that, regarding the cost factors, savings can be made at the following rates.

Direct First Substance and Material Expenses are the expenses that directly enter the body of the product and whose technical and economic value can be determined very easily (Savcı, 2012: 130). The share of direct item and material expenses in total production costs (16 444, 10 / 19 346, 00) in our sample business is approximately 85%. 80% of the interviewed people can save at least 10-15%; 20% stated that thanks to a good policy, the saving rate can be approached to 0%.

Direct Labor Expenses are related to production expense locations and are the use of value that can be directly loaded into production and form the product, changing its shape, structure and status (Savcı, 2012: 136). The share of direct labor expenses in total production costs (967, 30 / 19 346, 00) in our sample business in 2019 is approximately 5%. 87% of the interviewed people stated that they could not save and 13% stated that they could save 2-3%.

General Production Expenses, on the other hand, refer to all the use of value related to production, other than direct raw material and material costs and direct labor costs. These value uses are those that cannot be directly loaded on the manufactured product (Savcı, 2012: 138). The share of general production expenses in total production costs (1 934, 60 / 19 346, 00) in our sample business is approximately 10%. 80% of the interviewed people stated that 5-6% savings can be made if natural gas is used as fuel, and 20% can save 10% if natural gas and quality material input is used.

Table 4. Production Costs of Sample Enterprise by Years

Cost Elements *	2015	2016	2017	2018	2019
(+)Direct First Material and Material Expenses	11 464,375	12 483,10	13 540,50	14 688,00	16 444,10
(+)Direct Labor Costs	674,375	734,30	796,50	864,00	967,30
(+)General Production Expenses	1 348,75	1 468,60	1 593,00	1 728,00	1 934,60
(=)Total Production Cost	13 487,50	14 686,00	15 930,00	17 280,00	19 346,00
Total Production Number **	20 750,0	20 980,0	21 240,0	21 600,0	22 760,0
Unit Cost	0,650 tenge/piece	0,700 tenge/piece	0,750 tenge/piece	0,800 tenge/piece	0,850 tenge/piece
*million tenge **piece					

The participation of the value chain members in the cost estimation and cost reduction process in the sample business is shown in Table 5. According to this table, the value chain members generally take part in the cost estimation and cost reduction process with a rate of 40.6% from the accounting-finance department, and they usually participate in the sales and marketing department at a rate of 26.5%, product planning-design engineering and research. And they never attended at the rate of 34.1% from the development department, they usually attend at the rate of 30.9% from the purchasing service, they never attend at the rate of 32.5% from the production part, 29.7% from the quality control part. They explain that they generally attend to a certain extent, sometimes participate in distribution and logistics with a rate of 27.7% and suppliers sometimes attend with a rate of 36.5%.

Table 5. Value chain members' participation in cost estimation and cost reduction

Value Chain Members	Allways		In General		Sometimes		Rarely		Never		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Accounting / Finance	50	20,1	101	40,6	49	19,7	18	7,2	31	12,4	249	100
Sales and marketing	43	17,3	66	26,5	57	22,9	38	15,3	45	18,1	249	100
Product Planning / Design Engineering-R&D	27	10,8	55	22,1	51	20,5	31	12,4	85	34,1	249	100
Purchase	54	21,7	77	30,9	56	22,5	33	13,3	29	11,6	249	100
Production	34	13,7	62	24,9	45	18,1	27	10,8	81	32,5	249	100
Quality Control	39	15,7	74	29,7	55	22,1	40	16,1	71	28,5	249	100
Distribution / Logistics	18	7,2	53	21,3	69	27,7	46	18,5	63	25,3	249	100
Suppliers	20	8,0	53	21,3	91	36,5	54	21,7	31	12,4	249	100

Information about the application level of 5S, which is a management philosophy of Kaizen Costing System in the sample business, is shown in Table 6. According to Table 6, it can be said that the classification and standardization is good in the implementation of 5S in the sample enterprise, and the regulation, cleaning and discipline is very good. This situation increases the application level of Kaizen Costing methods for the enterprise. In addition, as a result of the structured interview and observation, it has been seen that the main components of Kaizen costing can be easily applied to all activities of the enterprise.

Table 6. Application level of 5S in business

5S	Best		Good		Middle		Worse		Worst		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Sort	72	28,9	130	52,2	39	15,7	6	2,4	2	0,8	249	100
Set in order	105	42,2	99	39,8	41	16,5	2	0,8	2	0,8	249	100
Shine	120	48,2	91	36,5	31	12,5	4	1,6	3	1,2	249	100
Standardize	79	31,7	110	44,2	46	18,5	11	4,4	3	1,2	249	100
Sustain	123	49,4	84	33,7	36	14,5	4	1,6	2	0,8	249	100

Conclusion and Recommendations

It is seen that the effect of Kaizen costing on reducing production losses from activities that do not create value has been adopted by the continuous improvement approach in the enterprise. With the continuous improvement approach, it is aimed to increase the efficiency of activities that create value, and to prevent unnecessary losses by reducing or eliminating activities that do not create value. In the enterprise, activities that do not create value related to the production process are encountered before and during production. While activities that do not create pre-production value appear as wasted time during supply and purchase, in the production process, it causes production losses due to reasons such as breakdown of machines and power outages.

Another remarkable subject about the sample business is workmanship. Here, special attention is paid to craftsmanship and attention is paid to the training and continuity of workers working in production. Even the unskilled workers are preferred by the local people who have knowledge about transformer production. In this way, the continuity of workers to work is maximized and production losses due to workmanship are minimized. The point of view of the sample enterprise over the overall production costs is also strategic. It is aimed to reduce the production losses caused by the breakdown of the machines in the production process by paying due attention to maintenance and repair.

It can be said that the exemplary enterprise has a strategic perspective regarding activities that do not create value and especially production losses. However, the most important thing to be done directly related to the first substance and material expense is the necessity to establish a standard purchasing policy regarding this cost element, not only within the factory, but also with suppliers (preparations). In this way, it is possible to save 15% in direct raw material and material expenses.

Suggestions regarding the effect of Kaizen costing system on reducing production losses have been developed by considering the answers of the questions asked during the semi-structured interview and survey study in the sample business;

- Kaizen Costing Technique should continue to be implemented by all employees at all business levels;
- Importance they attach to the implementation of 5S, which is a management philosophy, should continue;
- It is absolutely necessary to prevent unforeseen mistakes and defects, to minimize them and therefore to realize the necessity to apply Poka Yoke system;
- Cost reduction efforts for new or existing products should be carried out at both the product design and production stages.

As a result, through the Kaizen costing, the efficiency of activities that create value can be increased and the effect of activities that do not create value can be reduced or eliminated in this exemplary enterprise producing transformers. Briefly, with the application of Kaizen costing, activities that do not create value and cause waste in the production process can be eliminated and a positive effect can be made on production losses and production costs.

In summary terms, it is possible to apply the main components of Kaizen costing in the sample business. In this way, unnecessary stock availability, production losses, wasted time and quality problems due to various production failures can be reduced. Unnecessary transfer time and waiting time can also be eliminated. By focusing on the standards in the production process, continuous improvements can be made and internal cost reduction and productivity increase can be achieved. In this way, an advantage against its competitors can be obtained in the intense competition environment in the tea industry.

Findings obtained in this research are qualitative results. Therefore, generalization cannot be made. In further studies, the study can be supported by conducting quantitative research on the subject. In order to determine the effect of Kaizen costing on activities that do not create value more realistic, it is necessary to focus on activities that do not create value other than production losses.

References

An official website of "Alageum Electric" HC from <https://alageum.com/en/predpriyatiya/ao-ktz>

Bozdemir, E., Orhan, M. (2012). Üretim Maliyetlerinin Düşürülmesinde Kaizen Maliyetleme Yönteminin Rolü ve Uygulanabilirliğine Yönelik Bir Araştırma (A Study on the Role and Applicability of Kaizen Costing Method in Reducing Production Costs). *Atatürk Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, Volume 15, Issue 2, Pages 463-480. <https://dergipark.org.tr/tr/pub/ataunisobil/issue/2828/38347>

Bozdemir, E. (2018). Comparison of Standard and Kaizen Costing Methods in Cost Management: A Case Study. *Asian Research Journal of Business Management*, Volume 5, Issue 4, Pages 1-13. <https://doi.org/10.24214/ARJBM/5/4/113>

Chen, X. (2015). Instruments of Strategy Management Accounting and Their Application in Inter-Organizational Cost Management. *ICCREM 2015 - Environment and the Sustainable Building - Proceedings of the 2015 International Conference on Construction and Real Estate Management*, Pages 33-41. <https://doi.org/10.1061/9780784479377.005>

Collatto, D.C., De Souza, M.A., Do Nascimento, A.P., Lacerda, D.P. (2016). Interactions, convergences and interrelationships between lean accounting and strategic cost management: A study in the lean production context. *Gestao e Producao*. Volume 23, Issue 4, Pages 815-827. <https://doi.org/10.1590/0104-530x1279-15>

Dhingra, A.K., Kumar, S., Singh, B. (2019). Cost reduction and quality improvement through Lean-Kaizen concept using value stream map in Indian manufacturing firms. *International Journal of Systems Assurance Engineering and Management*. Volume 10, Issue 4, Pages 792-800. <https://doi.org/10.1007/s13198-019-00810-z>

Gül, K., Gül, M. (2017). Endüstriyel Yiyecek Endüstrisinde Tedarik Zincirinde Geriye Doğru Büyümenin Maliyet Etkisi. *Dokuz Eylül Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, Volume 19, Issue 2, Pages 231-248. <https://dergipark.org.tr/tr/pub/deusobil/issue/36365/411269>

Hacıhasanoğlu, T. (2014). Üretim Maliyetlerinin Düşürülmesinde Kaizen Maliyetleme Yöntemi ve Mobilya Sektöründe Bir Uygulama. *Ekonomik ve Sosyal Araştırmalar Dergisi*, Volume 10, Year 10, No 2, Pages 47-64. <https://dergipark.org.tr/en/pub/esad/issue/6070/81681>

Ighravwe, D.E. and Oke, S.A. (2020). Sustenance of zero-loss on production lines using Kobetsu Kaizen of TPM with hybrid models. *Total Quality Management and Business Excellence*. Volume 31, Issue 1-2, Pages 112-136. <https://doi.org/10.1080/14783363.2017.1415754>

Ihrig, S., Ishizaka, A., Mohnen, A. (2017). Target setting for indirect processes: a new hybrid method for the continuous improvement management of indirect processes. *Production Planning and Control*. Volume 28, Issue 3, Pages 220-231. <https://doi.org/10.1080/09537287.2016.1254830>

Kustono, A.S., Mas'ud, I., Agustina, W. (2020). Elimination non value-added chain: Case in cassava fermented industry Bondowoso-Indonesia. *International Journal of Scientific and Technology Research*. Volume 9, Issue 2, Pages 2215-2218. <http://www.ijstr.org/final-print/feb2020/Elimination-Non-Value-added-Chain-Case-In-Cassava-Fermented-Industry-Bondowoso-Indonesia.pdf>

Kurebwa, J., Mushiri, T. (2019). Design and simulation of an integrated steering system for all-purpose Sport Utility Vehicles (SUVs) - Case for Toyota. *Procedia Manufacturing*. Volume 35, Pages 56-74. <https://doi.org/10.1016/j.promfg.2019.07.002>

Macpherson, W., Lockhart, J. & Kavan, H. (2015). Kaizen: a Japanese Philosophy and System for Business Excellence. *Journal of Business Strategy*, September, Volume 36, Issue 5, Pages 3-9. <https://doi.org/10.1108/JBS-07-2014-0083>

Monden, Yasuhiro. (2011). *Toyota Production System: An Integrated Approach to Just-In-Time*. New York: Productivity Press, 4th Edition. 566 pages. <https://doi.org/10.1201/b11731>

Monden, Yasuhiro. (2016). "Solving the Wage Differentials Throughout the Supply Chain by Collaborative Innovations for Changing the Parts Prices and Costs" World Scientific Book Chapters, in: Kazuki Hamada & Shufuku Hiraoka (ed.), *MANAGEMENT OF INNOVATION STRATEGY IN JAPANESE COMPANIES*, Chapter 5, Pages 67-93, World Scientific Publishing Co. Pte. Ltd. https://www.worldscientific.com/doi/pdf/10.1142/9789813100282_fmatter

Okutmuş, E., Ergül, A. (2015). Konaklama İşletmelerinde Hedef Maliyetleme, Değer Analizi ve Kaizen Maliyetleme Yöntemlerinin Birlikte Uygulanabilirliğine İlişkin Bir Araştırma. *Muhasebe ve Finansman Dergisi*, Issue 65, Pages 97-116. <https://doi.org/10.25095/mufad.396519>

Rodriguez, M.A., Lopez, L.F. (2012). Kaizen and Ergonomics: The Perfect Marriage. *Journal of Prevention, Assessment and Rehabilitation*, Volume 41, No 1, Pages 964–967. <https://doi.org/10.3233/WOR-2012-0271-964>

Rof, L.M. (2011). Kaizen Costing Method And Its Role In The Management Of An Entity. *Revista Tinerilor Economisti (The Young Economists Journal)*. Volume 1, Issue 16, Pages 104-109. <http://feaa.ucv.ro/RTE/016-13.pdf>

Santos, H., Pereira, M.T., Silva, F.J.G., Ferreira, L.P. (2018). A Novel Rework Costing Methodology Applied to a Bus Manufacturing Company. *Procedia Manufacturing*. Volume 17, Pages 631-637. <https://doi.org/10.1016/j.promfg.2018.10.109>

Shou, W., Wang, J., Wu, P., Wang, X. (2020). Value Adding and Non-Value Adding Activities in Turnaround Maintenance Process: Classification, Validation, and Benefits. *Production Planning and Control*. Volume 31, Issue 1, Pages 60-77. <https://doi.org/10.1080/09537287.2019.1629038>

Sowmya, C., Ramesh, V., Vijaya Kumar, P. (2020). Man Power Reduction in Moulding Operations through SWCT Study Technique. *Test Engineering and Management*. Volume 83, Pages 8284-8292. <http://www.testmagazine.biz/index.php/testmagazine/article/view/5145/4154>

Yan, N., Jin, X., Zhong, H., Xu, X. (2020). Loss-averse retailers' financial offerings to capital-constrained suppliers: loan vs. investment. *International Journal of Production Economics*. Volume 227, Pages 53-66. <https://doi.org/10.1016/j.ijpe.2020.107665>

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