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Business Process Recommendations to Reduce The Number of Product Returns Using Lean Thinking and Fuzzy Takagi-Sugeno

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Abstrak

Pengembalian produk menjadi salah satu tantangan bagi pelaku bisnis di sektor manufaktur. Pengembalian produk juga muncul di salah satu perusahaan industri makanan ringan di Kota Kediri. Perusahaan ini mendapatkan jumlah pengembalian produk makanan yang lebih tinggi daripada penjualan produk ini. Pengembalian pada perusahaan ini dikarenakan produk makanan yang dijual telah melewati masa kadaluwarsa. Untuk mengatasi permasalahan tersebut, pihak manajemen perusahaan perlu mengidentifikasi proses bisnisnya. Jumlah pengembalian produk yang terlalu tinggi mempengaruhi tujuan bisnis sebuah perusahaan. Sasaran bisnis yang tidak dapat dipenuhi mengharuskan manajemen untuk mengidentifikasi penyebab masalah tersebut. Penelitian ini bertujuan untuk mengidentifikasi permasalahan pada proses bisnis perusahaan makanan ringan dengan menggunakan metode root cause analysis dan lean thinking serta mendapatkan rekomendasi proses bisnis baru pada perusahaan makanan ringan dengan menggunakan metode lean thinking dan fuzzy Takagi-Sugeno. Penelitian ini juga bertujuan untuk mengetahui apakah rekomendasi proses bisnis pada perusahaan makanan ringan yang baru dapat menekan jumlah pengembalian produk atau tidak. Hasil rekomendasi proses bisnis yang telah dilakukan selama 57 hari telah mencapai nilai akurasi sebesar 95%, dan nilai pengembalian produk mengalami penurunan sebesar 23%.

Kata kunci: ***Bisnis Proses, Fuzzy, Lean Thinking***

Abstract

Product returns are one of the challenges facing manufacturing business people. Product returns have also surfaced for companies in the snack food industry in the town of Kediri. This company earns a higher return on food products than on sales of these products. Returns are due to food products that are sold having exceeded the expiration. To overcome these problems, the management company needs to identify the business processes in an enterprise snack. Excessive Product Returns Affect Snack Food Company's Business Goals. Business goals that cannot be met require management to identify the causes of these problems. This study aims to identify problems in a snack food company's business processes using root cause analysis and the lean thinking method, and to recommend new business processes for a snack food company using lean thinking and the fuzzy Takagi-Sugano method. Additionally, the study aims to determine whether the new snack food company's business process recommendations can reduce the number of product returns. The results of the business process recommendations implemented over 57 days achieved a Curacy score of 95 and a 23% reduction in product returns scores.

Keywords: ***Business Process, Fuzzy, Lean Thinking***

I. INTRODUCTION

The business will flourish when customer satisfaction is well maintained. To meet customer needs, business operators are required to act accurately and promptly, as it significantly influences both

customer satisfaction and profitability within a company [1]. Product returns are one of the challenges facing manufacturing business people. This return is due to consumer dissatisfaction with the product, such as a defective product, not meeting expectations, or other reasons [2]. In recent years, it has been noted and reported that an increasing number of food products are refund [3]. Product returns were also detected at a company in the snack food industry in the town of Kediri. This company generates far more food returns than food sales. The profit and loss statement for June 2020 shows that the profit value after deducting product returns and the cost of goods sold is about 7 billion rupiahs. This value is obtained because the number of product returns significantly exceeds the revenue value. Returns are due to food products that are sold having exceeded the expiration. To overcome these problems, the management company needs to identify the business processes in an enterprise snack.

A business process is a set of interrelated activities carried out by resources in an organization or company to achieve results that can meet business goals [4]. Excessive product returns negatively impact a snack food company's business goals. Business objectives that cannot be met require management to identify the causes of these problems. He also explains that many prominent companies have realized that integrating different organizational resources and functions can make their business processes more efficient at creating economic value [5][6][7]. For long-term corporate goals that are right on target, plans, and strategies must be adapted to the company's identity, culture, and leadership.

Identifying the snack food company's business processes is done by modeling them using Business Process Modeling Notation (BPMN). Additionally, a Root Cause Analysis (RCA) was performed to identify the root cause of the issue. RCA is used to troubleshoot or eliminate root causes and prevent problems from reoccurring [8].Use the RCA results to identify and further identify the processes that have the greatest impact on product return issues. Further identification is carried out on the business processes that affect the problem.

The first phase committed against the most effective business processes is finding waste using lean thinking. Waste arises from the rights to resources and the inefficient activities of businesses that do not add value [9]. In the lean thinking method, the solution can be determined after the waste is found. The solution reduces and eliminates waste that occurs in business processes [10]. Waste can be found and eliminated using several lean techniques. One of them is the value stream map (VSM) [11].

VSM is a technique for identifying all activities (value-adding and non-value-adding) within a process flow [12] Venkataraman et al., 2014). Waste values are calculated using fuzzy numbers to reduce ambiguity in human perceptual evaluations. Fuzzy Takagi-Sugeno is a decision-making technique that determines the best option among multiple options based on specific criteria. The criteria used are based on processing time limits identified by food expert staff.

Classification by Takagi-Sugano fuzzy calculation determines waste that needs to be eliminated, reduced, or maintained. This new business process aims to reduce the turnaround time for each activity in order to reduce product returns at the snack foods company.

This study aims to identify problems in a snack food company's business process using root cause analysis and lean thinking methods, and to make recommendations for a new business process for a snack food company using lean thinking and fuzzy Takagi and Sugano. is to get Additionally, the study aims to determine whether the new snack food company's business process recommendations can reduce the number of product returns.

II. LITERATURE REVIEW

In previous research, lean has been used in manufacturing to improve warehouse operations by eliminating waste and waste. This study leads to changes in the layout of operational warehouse processes (Baby, et al., 2018). In contrast to previous studies, the study in this work uses lean to reduce and eliminate waste in all business process activities addressing the problem of snack food companies. This study does not stop all found waste, but uses waste classification.

Fuzzy logic is also used to measure the extent of lean implementation in a study titled "Fuzzy logic-based method for measuring the extent of lean activity in manufacturing" (2014). This measurement is highly complex due to subjective human judgments of lean practices. In this study, we propose a method to handle the ambiguity of human judgment modeled with fuzzy numbers considering the timing of lean application and the use of multiple evaluators (Susilawati et al., 2014). Unlike this study, this study uses fuzzy to measure the level of waste in each activity that

impacts organizational issues. Waste was discovered using a lean thinking approach.

III. METHODS

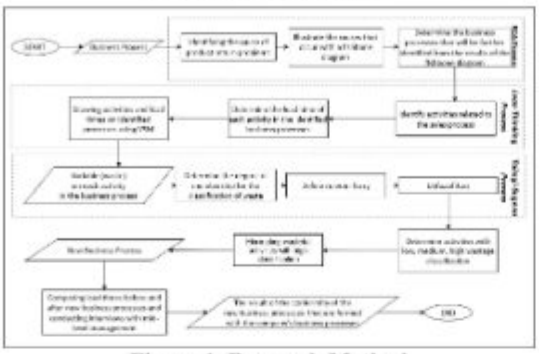

Figure 1. Research Method

The method proposed in this study is illustrated in the flowchart of Figure 1. The following is an explanation:

1. Identifying the causes of product return problems with root cause analysis (RCA) in the business processes of a snack food company.
2. Visualize the causes of identified problems using fishbone diagrams.
3. Determine the business processes that cause the most product return problems.
4. Through field observations and data, identify the business process activities that have the greatest impact on the snack food company's problems.
5. Determine the lead time of each activity in the business process with field observations and interviews.
6. Drawing activities and lead times on business processes using VSM (Value Stream Map).
7. Determine the variables to be used in Fuzzy Takagi-Sugeno. These variables are seven types of waste in the lean method: transportation, waiting, overproduction, defective parts, inventory, movement, and excess processing.
8. Determine the degree of membership in the fuzzy, which is a waste classification for each type of waste.
9. Define rules on fuzzy Takagi-Sugeno.
10. Defuzzification to decide the type of every waste for every activity.
11. Repeat processes 7-9 on other business process activities.
12. Determine the activities that have a high wattage value to be eliminated from the business process.
13. Create new business processes by eliminating wastes found with high classifications.
14. Comparing the lead time before and after the new business process is formed, then evaluated by interviewing the middle-level management (managers, division heads, and expert staff) to determine the suitability of the new business processes with business processes in a snack food company.
15. Generate recommendation results from the suitability of new business processes that are formed.

A. Root Cause Analysis (RCA) and Lean Thinking Methods

Identifying a snack food company's business process begins by representing a snack company's business process flow using Business Process Modeling Notation (BPMN).

Figure 2 shows the takeout company's business process flow described using Business Process Modeling Notation (BPMN). The business flow explained here is the business flow from the receipt of an order at a dealer or tollgate to the sale of the finished product.

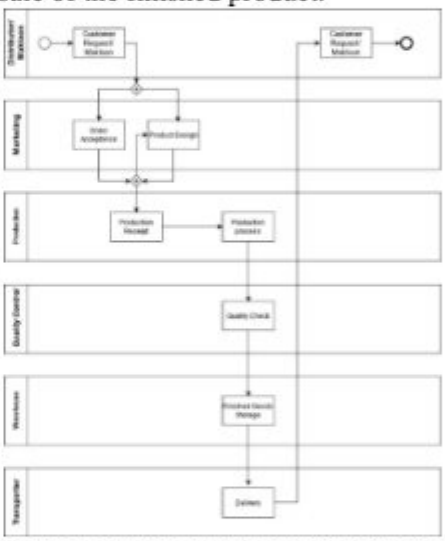

Figure 2. Business Process Modelling Notation (BPMN)

From the description in BPMN Figure 2, researchers used root cause analysis (RCA) methods to identify the root causes that led to a large number of product returns at a snack food company. Researchers observed and interviewed experts from each unit. Observation and interview results are visualized using the fishbone diagram in Figure 3.

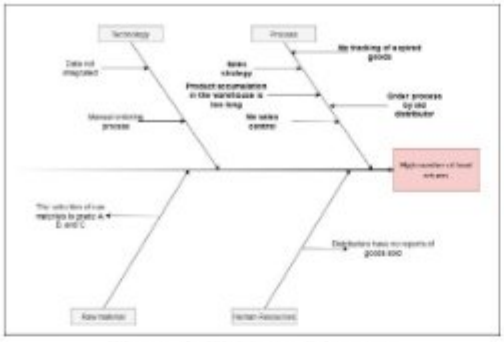

Figure 3. Fishbone Diagram

The root cause for Figure 3 is a large number of food returns at a snack food company. Some of the main problems in the company are described by 4 branches, namely technology, processes, raw materials, and human resources.

The causal factors of the HR problems that were found were more directed to the company's sales system, where there was no record of sales by distributors. From the problem of raw materials, the causative factors found are more directed to the company's production system related to the selection of raw materials. The factors causing the technical problems encountered are more directed to the company's sales system, which is still manual and traditional. Internal data cannot be integrated in real-time. For process problems, the causal factors found are more directed to the company's sales system, which is still manual and traditional.

Figure 3 and the discussion above show that the sales business process has the greatest impact on food returns for a snack food company. This is due to many factors that drive business processes. According to interviews and observations, the sales process is the business process that has the greatest impact on increasing food returns for snack food companies. The sales process was also identified as a waste created by lean thinking and redesigned.

B. Lean Thinking and Fuzzy Takagi Sugeno

All activities related to the Snackbar company's problem sales business process are mapped using Value Stream Mapping (VSM). This mapping shows the lead time identification results for each of these activities.

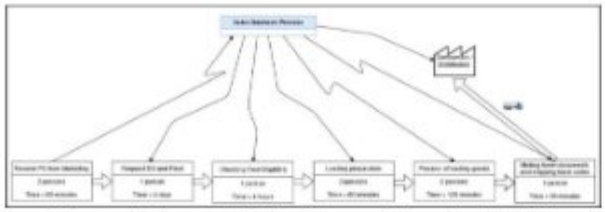

Figure 4. Current Value Stream Mapping (VSM)

Figure 4 shows all the activities related to the sales process of the snack food company's problem. This mapping shows the observations from the lead times for each of these activities and the results of interviews with experts. Throughput time is the time it takes for one activity to execute before the next activity executes. The wait time for each activity is also included in the lead time.

Once the VSM is formed, the next process is to use fuzzy Takagi-Sugano to determine the waste classification for each of these activities. According to Taiichi Ohno (Wilson, 2010), the variables used to compute fuzzy Takagi-Sugano use seven types of wastage. Transportation, maintenance, overproduction, defective parts, inventory, movement, overprocessing. Each waste becomes a variable to determine the waste classification for each activity. The vaguely calculated times were obtained from interviews with industry experts, and the average time for each activity was based on the authors' observations at snack food companies.

Takagi-Sugeno fuzzy computation begins with a fuzzification stage aimed at determining the degree of membership of the inputs to the fuzzy set. The input used is the time obtained from interviews and the time obtained from the observations of researchers. The two variables are defined by three fuzzy sets, which are the classification of each waste, namely: Low, Medium, and High. Each fuzzy set has a membership interval derived from interviews with experts in each activity.

Table 1. A Table of Wasted Time for Each Activity

Activity	Waste	Time (observation)	Time (interview)
Receive PO from Marketing	Transportation	62 minutes	30 minutes
	Waiting	47 minutes	18 minutes
	Over Production	-	-
	Defective Parts	-	-
	Inventory	-	-
	Movement	3 1 minute	15 minutes
	Overprocessing	-	-
Request DO and fleet	Transportation	78 hours	48 hours
	Waiting	118 hours	48 hours
	Over Production	-	-
	Defective Parts	-	-
	Inventory	-	-
	Movement	-	-
	Overprocessing	-	-
Checking the suitability of the fleet	Transportation	26 minutes	15 minutes
	Waiting	7 hours	4 hours
	Over Production	-	-
	Defective Parts	-	-
	Inventory	-	-
	Movement	10 hours	4 hours

	Overprocessing	-	-
Loading preparation	Transportation	12 minutes	5 minutes
	Waiting	72 minutes	45 minutes
	Over Production	-	-
	Defective Parts	-	-
	Inventory	-	-
	Movement	-	-
	Overprocessing	-	-
The process of loading goods	Transportation	17 minutes	5 minutes
	Waiting	116 minutes	45 minutes
	Over Production	-	-
	Defective Parts	-	-
	Inventory	-	-
	Movement	92 minutes	45 minutes
	Overprocessing	-	-
Making travel documents and trace codes	Transportation	42 minutes	10 minutes
	Waiting	41 minutes	10 minutes
	Over Production	-	-
	Defective Parts	-	-
	Inventory	-	-
	Movement	-	-
	Overprocessing	-	-

Table 1 shows the amount of wasted time for each activity in the sales process. Times are obtained from interviews with company experts, and the average time for each activity is based on the author's observations at snack food companies. Then Takagi-Sugano fuzzy is used to calculate the resulting time to obtain high, medium and low waste classifications for each activity.

In this work, we use a zero-order Takagi-Sugano fuzzy model. The format of the model is:

IF (x1 is a1) ° (x2 is A2) °…°(xn is An)

THEN z = k,

An is a fuzzy set as an antecedent (reason), ° is a fuzzy operator (AND or OR) and k is a firm constant as a consequent (conclusion).

The next stage of the Takagi-Sugeno fuzzy process is the formation of fuzzy rules. At this stage, the set membership value for wasted waiting time based on interviews and observations is determined using the membership function according to the data. The formation of Fuzzy Rules is defined by identifying data on the predetermined membership function.

Table 2. Table of Time Waste of Each Activity

	Observation			
Interview		**Low**	**Medium**	**High**
	Low	Low	Medium	High
	Medium	Medium	Medium	High
	High	High	High	High

Table 2 shows a table of fuzzy rules with 2 (two) parameters: interviews and observations. Each parameter uses three classifications, so it uses fuzzy rules like the table above.

After the fuzzy rules are defined, then is to calculate the membership value for each variable. The implication function used in this study is the MIN (minimum) function, taking the minimum membership level of the input variable as the output.

Table 3. Table of Indices of Waste Classification Variables

Variable k	Index k
Low	0.3
Medium	0.6
High	0.9

Table 3 shows the index table of wastage classification variables. This k index is used to calculate the z value, depending on the variables that have been determined in Table 4.2. This index k figure is determined from interviews and agreements with company expert staff who are in direct contact with the sales business process.

The last process of the Takagi-Sugeno fuzzy calculation is defuzzification. In the defuzzification stage, choose the highest value of α_predicate which has been calculated previously using the Max method. The identification stage of this research is done by documenting the fuzzy calculation data in a table. The next step is to select waste that falls into medium and high categories to repair or dispose of.

IV. RESULTS AND DISCUSSION

Takagi-Sugano The waste of fuzzy processing is the formation of fuzzy rules. At this stage, the membership value of the set for transportation waste time based on interviews and observations is determined using the membership function according to the data and visualized in Figure 4.5. The formation of Fuzzy Rules is defined by identifying data on the predetermined membership function.

After the fuzzy rules are defined, then is to calculate the membership value for each variable. The transportation variable from PO activities from marketing according to the interview results is 30 minutes. These values are included in the Low and Medium membership functions so that they are obtained as follows:

$$\mu\,\text{Low}(x) = \begin{cases} 1 & ; \quad x \le 20 \\ \frac{45-x}{45-20}; & 20 \le x \le 45 \\ 0 & ; \quad x \ge 45 \end{cases}$$

$$\mu\,\text{Low}(x) = \frac{45-30}{45-20} = \frac{15}{25} = 0{,}6$$

$$\mu\,\text{Medium}(x) = \begin{cases} \frac{x-20}{45-20}; & 20 \le x \le 45 \\ \frac{90-x}{90-45}; & 45 \le x \le 90 \\ 0 & ; \quad x \ge 45 \end{cases}$$

$$\mu \text{ Medium}(x) = \frac{30-20}{45-20} = \frac{10}{25} = 0{,}4$$

The transportation variable from PO activities from marketing according to the researchers' observations' average calculation sites. These values are included in the Medium and High membership functions so that they are obtained as follows.

$$\mu \text{ Medium}(x) = \begin{cases} \frac{x-20}{45-20}; & 20 \le x \le 45 \\ \frac{90-x}{90-45}; & 45 \le x \le 90 \\ 0; & x \ge 45 \end{cases}$$

$$\mu \text{ Medium}(x) = \frac{90-62}{90-45} = \frac{28}{45} = 0{,}6$$

$$\mu \text{ High}(x) = \begin{cases} 1; & x \ge 90 \\ \frac{x-45}{90-45}; & 45 \le x \le 90 \\ 0; & x \le 45 \end{cases}$$

$$\mu \text{ High}(x) = \frac{62-45}{90-45} = \frac{17}{45} = 0{,}4$$

The implication function used in this study is the MIN (minimum) function, taking the minimum membership level of the input variable as the output. Based on table 2 regarding fuzzy rules, the α - predicate is obtained as follows:

$$\begin{aligned} \alpha_{-\text{1st predicate}} &= \mu_{\text{interview-low}} \cap \mu_{\text{observation-medium}} \\ &= \min(\mu_{\text{interview-low}}[30] \cap \mu_{\text{observation-medium}}[62]) \\ &= \min(0{,}6; 0{,}6) = 0.6\ (Medium) \\ \alpha_{-\text{2nd predicate}} &= \mu_{\text{interview-medium}} \cap \mu_{\text{observation-medium}} \\ &= \min(\mu_{\text{interview-medium}}[30] \cap \mu_{\text{observation-medium}}[62]) \\ &= \min(0{,}4; 0{,}6) = 0{,}4\ (\text{Medium}) \\ \alpha_{-\text{3rd predicate}} &= \mu_{\text{interview-low}} \cap \mu_{\text{observation-high}} \\ &= \min(\mu_{\text{interview-low}}[30] \cap \mu_{\text{observation-high}}[62]) \\ &= \min(0{,}6; 0{,}4) = 0{,}4\ (\text{High}) \\ \alpha_{-\text{4th predicate}} &= \mu_{\text{interview-medium}} \cap \mu_{\text{observation-high}} \\ &= \min(\mu_{\text{interview-medium}}[30] \cap \mu_{\text{observation-high}}[62]) \\ &= \min(0{,}4; 0{,}4) = 0{,}4\ (\text{High}) \end{aligned}$$

The last process of the Takagi-Sugeno fuzzy calculation is defuzification. In the defuzzification stage, choose the highest value of α - predicate which has been calculated previously using the Max method. The waste of transportation in receiving PO activities has the highest index of 0.6 with medium classification. The final decision index (Z) of the defuzzification process is as follows:

$$\begin{aligned} Z &= \frac{(\alpha_{-\text{1st predicate}} \times k1)+(\alpha_{-\text{2nd predicate}} \times k2)+(\alpha_{-\text{3rd predicate}} \times k3)+(\alpha_{-\text{4th predicate}} \times k4)}{\alpha_{-\text{1st predicate}}+\alpha_{-\text{2nd predicate}}+\alpha_{-\text{3rd predicate}}+\alpha_{-\text{4th predicate}}} \\ &= \frac{(0{,}6\times0{,}6)+(0{,}4\times0{,}6)+(0{,}4\times0{,}9)+(0{,}4\times0{,}9)}{(0{,}6+0{,}4+0{,}4+0{,}4)} \\ &= \frac{0{,}36+0{,}24+0{,}36+0{,}36}{1{,}8} = \frac{1{,}32}{1{,}8} = 0{,}73 \end{aligned}$$

The value of wastage of transportation on receiving PO from marketing gets 0.73 results with a medium classification. The fuzzy calculation results are shown in Table 4. Then choose to repair or dispose of the waste in the medium and high categories.

Table 4. Table of Waste Classification

Activity	Waste	Z	Classification
Receive PO from Marketing	Transportation	0.73	Medium
	Waiting	0.77	High
	Movement	0.9	High
Request DO and fleet	Transportation	0.66	Medium
	Waiting	0.88	High
Checking the suitability of the fleet	Transportation	0.77	High
	Waiting	0.79	High
	Movement	0.71	Medium
Loading preparation	Transportation	0.36	Low
	Waiting	0.73	Medium
The process of loading goods	Transportation	0.51	Medium
	Waiting	0.86	High
	Movement	0.56	Medium
Making travel documents and trace codes	Transportation	0.84	High
	Waiting	0.82	High

The classification of waste shows activities that produce high, medium, or low waste. Low waste activities do not affect the time of the sales process. Medium to high waste activities can eliminate or minimize business processes in sales. Resolution is accomplished through interviews with managers and observation of activity related to the cause of the classification. Table 5 shows the data from the solution for each of these activities.

Table 5. Breakdown of Wasteful Activities

Activity	Solution
Receive PO from Marketing	PO receipts that were previously done using the Whatsapp application or office telephone (tend to not be picked up due to team mobility), can be done by using a mobile phone to the admin, warehouse, and marketing admin teams so that the response will be faster
Request DO and fleet	DO and fleet requests that were previously made using the Whatsapp application or office phone (tends not to be picked up due to team mobility), can be done by using a mobile phone to the delivery team so that the response will be faster.
Checking the suitability of the fleet	Fleet checks, which were previously carried out by 1 personnel, can be carried out with additional personnel of 3-4 people, so that fleet checks can be carried out more quickly. In addition, a routine service letter can be requested for each fleet, so there is no need to do a full fleet check.
Loading preparation	Confirmation of previous loading preparations using the Whatsapp application or office phone (tends not to be picked up due to team mobility), and the classification of

	waste is included in the medium classification, so if you want to speed things up, you can use a mobile phone or HT to phone, so that the response will be faster.
The process of loading goods	Confirmation of the loading process, which was previously done using the Whatsapp application or office phone (tends not to be lifted due to team mobility), can be done by using a mobile phone or HT to the warehouse admin team so that the response will be faster.
Making travel documents and trace codes	Making travel documents, which previously waited for the warehouse to confirm the admin team, can be accelerated by making travel documents when confirming the loading process.

Table 5 lists writer solutions that are offered to reduce or eliminate waste found in your organization's business process activities. The next step is to redesign the new sales process approved by management. The new sales process aims to reduce the processing time for each sales activity, thereby reducing the number of product returns.

Accuracy Test

The accuracy test is carried out by taking the opinions of expert staff who are in direct contact with the activities in the business processes under study. The expert staff totaled 11 people, consisting of 1 marketing manager, 1 custom manufacture marketing division head, 3 marketing staff, 1 admin, 1 warehouse division head, 1 warehouse admin, 1 transportation division head, 1 transportation staff, and 1 head of the shipping division. Researchers interviewed technical staff about a new business process implemented at a snack food company. Table 6 shows the test results.

Table 6. Accuracy Test Results

Object	Question	Accuracy
Receive PO from Marketing	Can receiving a mobile phone to the admin team, warehouse admin, and marketing, can make a faster response?	91%
Request DO and fleet	Can DO requests and fleets by using a mobile phone call to the delivery team make a faster response?	100%
Checking the suitability of the fleet	Can checking the fleet with 3 additional personnel speed up the process of checking the fleet?	82%
	Can the provision of routine service letters for each fleet also speed up the process of checking the fleet?	82%
Loading preparation	Can the confirmation of loading preparations be made by using a mobile phone or HT to make the process faster?	100%
The process of loading goods	Can confirmation of the loading process by using a mobile phone or HT to the warehouse admin team make a faster response?	100%
Making travel documents and trace codes	Can making a travel document at the same time as confirmation of the loading process makes the process faster?	100%
Average		**93,6%**

In Table 6 several activities are considered impossible to run using solutions in new business processes by several expert staff, namely the activity of Receiving PO from Marketing and Checking Fleet Feasibility. The average accuracy obtained from the 6 activities of new business processes with 11 correspondents reached 93,6%.

Accuracy Check Comparative Analysis of The Lead Time of New Business Processes with Past Projects

New sales processes are designed and visualized using VSM to identify gaps between current and expected processes. Using the results of the new sales process process, we performed a validation for the managers of the snack company to confirm that the solution could be used in the sales process and resolved the product return issue.

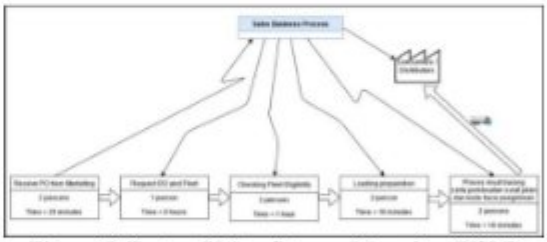

Figure 5. Future Value Stream Mapping (VSM)

Figure 5 shows all the activities of the snack food company's sales process after using the new business process. There is a difference between the current VSM in Figure 4 and his future VSM in Figure 5 where two activities are merged into one activity. Future VSM will combine the creation of travel documents and tracking codes with the act of loading goods.

From the gaps found, we can conclude that the provided solution can reduce the processing time for each sales business process activity. To ensure that the sales process is smooth and without long processes, and accelerate the sales of goods in snack food companies.

Comparative Analysis of Total Sales and Product Returns for the New Business Process with the Previous Business Process

The study was conducted from June 22, 2020 to August 31, 2020, implementing a new business process. Sales in May-June 2020 (before executing the new business process) and July-August 2020 (after executing the new business process) with a period of 57 business days to implement the new business process You can see a comparison between the number of returns and the number of returns. The data in Table 7 are from the August balance sheet, income statement, and independent auditor's report on the use of mutually agreed procedures for the sales return process at a food company located in Kediri, East Java.

Table 7. Comparison of Total Sales and Return Rate

Month	Sales (%)	Return (%)
April 2020	-	-
Mei 2020	**-42%**	**1%**
Juni 2020	**-12%**	**-0.5%**
Juli 2020	50%	-1%
Agustus 2020	12%	-23%

Table 7 shows that sales increased from July 2020 to August 2020. In June 2020 sales still decreased by 12% because the research was conducted at the end of June 2020, so the new business process was not optimal. In July 2020, sales reached 50%, while for August 2020, sales have only increased by 12% because the company is still focused on selling the remaining stock of goods in the warehouse.

The number of returns has decreased starting in June 2020 by 0.5%, due to the new business process being implemented at the end of June 2020. In June and May 2020, the number of product returns decreased significantly due to optimized business processes. In August 2020, product returns dropped dramatically by 23% as new business processes were implemented over his 57 working days.

At a snack food company in Kediri, East Java, food returns exceeded product sales. The income statement for June 2020 recorded a profit of Rp. - 5,402,916,234 (minus five billion four hundred two million nine hundred and sixteen thousand two hundred thirty-four rupiah). This value is caused by a large number of returns on products that exceed the value of income. To overcome these problems, the management company needs to identify the business processes in an enterprise snack.

A large number of product returns within the company impacts the company's business goals, namely, reduced corporate profits. Business objectives that cannot be met require management to identify the causes of these problems.

Previous research used fuzzy logic to measure the degree of lean implementation. This measurement is highly complex due to subjective human judgments of lean practices. In this study, we propose a method to handle the ambiguity of human judgment modeled with fuzzy numbers considering the timing of lean application and the use of multiple evaluators (Susilawati et al., 2014). This study uses fuzzy to measure the level of waste in each activity that impacts corporate issues. Waste was discovered using a lean thinking approach. This waste classification is used as the basis for eliminating waste in high and medium classification activities, as the waste results give the waste classification a distinct value. Create a new business process after eliminating the waste of middle and high classification.

V. CONCLUSION

The root purpose analysis (RCA) technique indicates that the commercial enterprise technique that has the maximum impact on returning meals merchandise in a snack meals enterprise is the income commercial enterprise technique. This is because of the various elements that purpose the commercial enterprise technique, which includes non-incorporated data, guide ordering methods, income strategies, product accumulation withinside the warehouse for too long, no income manage, no manage of expired goods, ordering methods with the aid of using vintage vendors, choice uncooked materials, recreation vendors and vendors there aren't anyt any reviews of products sold. Due to the various elements derived from the sale of commercial enterprise methods, in addition to primarily based totally on effects of interviews and observations with the professional body of workers of the enterprise, the commercial enterprise methods that maximum impact the boom withinside the range of product returns of meals at a snack enterprise is promoting the commercial enterprise technique. The lean wondering technique is used to discover waste that takes place withinside the income commercial enterprise technique, that is represented the usage of Value Stream Mapping (VSM). This mapping shows the effects of observations and interviews with professional body of workers from the lead time for every of those activities, then classifies the waste in every interest into 3, namely: Low, Medium and High.

Low waste activities do not affect the time of the sales process. Medium to high waste activities

can eliminate or minimize business processes in sales. Waste solutions are provided to overcome the waste created by adding tools and human resources. Resolution is accomplished through interviews with managers and observation of activity related to the cause of the classification.

The test accuracy is 95.5% value accuracy. The solutions provided can reduce turnaround time for all business process activities in sales. In contrast, a comparative lead-time analysis of the new business process and the old business process can reduce processing time. To ensure that the sales process is smooth and without long processes, and accelerate the sales of goods in snack food companies. A comparative analysis of the number of sales and returns before and after the introduction of the new business process shows that the number of sales increased in June and August 2020, and the number of returns decreased significantly. Sales increased by 50% in July 2020, with fewer returns. A new business process that the company ran optimally for 57 days led to a product return rate of 23% in August.

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