Performance and Problem Analysis in Credit Card Delivery of PT ABC

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Abstract. The requirement for dependable Supply Chain Management (SCM) efforts in order to provide the best services to customers is a component of business evolution.Credit card usage in Indonesia has increased year after year, prompting the banking sector to devote more resources to acquiring new customers.In order to grow its business, the banking company collaborates with third-party logistics to deliver credit card goods through an internal integrated system.The issue arises when a manufactured credit card fails to be delivered to the customer, and immediate action is required to resolve this issue so that the customer is satisfied.Problems within the credit card acquisition and delivery flow can be thoroughly analyzed using the quality management tools of a Pareto chart and a cause-effect diagram.Focus group discussions were used in qualitative studies to analyze the problem, and quantitative research was used to determine the best priority of the solution, according to the company.Analytic Hierarchy Process (AHP) methods help the company to prioritize its focus to pinpoint the best priority in the improvement of the company's supply chain. This harmonization of quality tools and the decision making process ought to help companies find the best solution to solve the credit card delivery problem.

Keywords: Problem Analysis, Quality Management Tools, Analytic Hierarcy Process Measurement

1 Introduction

Supply chain management (SCM) as a business philosophy has been revolutionized by improving the business competence and performance of all its members in the supply chain [1]. SCM integration in business requires a coordination mechanism in the form of business processes that are in line and interconnected between internal and external companies [2]. Based on this explanation, it is necessary to achieve harmonization in SCM so that the targets set by the company can be achieved by implementing the right strategy for carrying them out.

Credit cards are a legal means of payment in the form of cards used to conduct transactions as an economic activity in Indonesia (Bank Indonesia, 2021). There is a trend of increasing the number of credit card transactions by 7% per year from 2013 to 2021 with a total of 275 million transactions. Also, Indonesia have increased number of credit cards in circulation by 250 thousand per year, with a total of 16.94 million credit cards dated 2013 to 2021. The credit cards issued are then distributed by banks authorized by Bank Indonesia to the public in Indonesia.

PT ABC, one of the credit card issuing banks in Indonesia, printed more than 700 thousand credit cards in 2020. The credit card delivery business is carried out by collaborating

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internally and externally with expedition service companies, which are called third party logistics (3PL). Credit card delivery includes a complex workflow from the card application process, eligibility analysis, printing done internally, and followed by delivery by courier service to the customer.

Problem in credit card delivery, occour when more than 1,000 complaints per month about credit card shipments received by PT ABC from customers. This number equivalent to 6% of the number of credit card shipments per month in 2020. Some of the reasons for complaints received include failure of the first delivery, late receipt, incompatibility of receipt, credit card damage during shipping, and credit card loss. PT ABC has not carried out further analysis of handling complaints about sending credit cards through 3PL services specifically. Delays in delivery cause a decrease in the level of consumer loyalty [3], so this needs to be a concern because of shipping complaints received by PT ABC.

Using quality management tools in the form of cause-effect diagrams and Pareto analysis, as well as using the Analytic Hierarchy Process (AHP) method, credit card delivery problems will be investigated more specifically. Referring to several studies [4], [5], this method is able to find priorities in decision making so that the focus on problem solving can be carried out thoroughly and more focused. This research is expected to map the problems faced by PT. ABC in sending credit cards as well as provide recommendations for improvements to shipments.

This study will focus on the analysis of sending credit cards as well as the right solution for fixing them. We should be able to identify flaws in the process by analyzing the flow of the credit card supply chain process. Finding major and root causes in credit card distribution with the help of the PT ABC case gives priority to this selection.

2 Purpose and Methodology

Operations management focuses on managing a system that produces a product or provides a service (Jacobs & Chase, 2018). Meanwhile, according to other sources, the purpose of supply chain management is to maximize competitive advantage and provide benefits to customers. Supply chain management consists of various components, including suppliers, manufacturing companies or service providers, distributors, retailers, until finally accepted by customers (Heizer et al, 2016). Planning is aimed at determining business direction, anticipating demand, and using raw material strategies to fulfill demand; Sourcing with the selection of suppliers to be used as raw materials for the company to produce goods or services, which includes the process of receiving goods, verifying, and preparing raw materials at the factory; The production process is an important component in the supply chain; Deliveries as a logistics process for moving and bringing the production of services and goods from the warehouse to the consumer; Returning as this process determine the acceptance of defective, damaged, or excess goods from customers and providing technical assistance to customers who have difficulties with the products or services provided.

Quality tools are a method of solving problems related to quality using simple statistical calculations (Heizer et al., 2016). A tool is a tool that is used and has a clear function in completing an action, and a technique has a broader function than a tool because it requires more thought and practice [6]. According to Castello et al. (2019) [7], the Quality Tools & Techniques used have various functions, including as a tool to act proactively and conduct consultations on actions such as internal audits, surveys, and suggestion boxes; then as a tool to analyze and monitor problems such as brainstorming, flowchart diagrams, cause-effect diagrams, and praetor charts; Other functions become tools for finding solutions and

improvements, namely 5S methodology, Design of Experiments, and Value Stream Mapping. Another tool used to control a situation is the Pareto chart, which displays the frequency of events or problems in a bar graph to find the portion of the problem that is vital or critical to an event [8] Based on Castello et al. (2019) [7], the dominant quality tools that can be used in finding the root of the problem are cause effect diagrams and flowcharts because they show a comprehensive process to make it easier to find the root of the problem. Antony et al. (2021) [9] stated that quality tools in the form of pareto analysis, histograms, and cause-effect diagrams are the most frequently used tools in the manufacturing and service sectors).

According to Oguztimur (2015) [10] Multi Criteria Decision Making (MCDM) is an approach to decision making in which there are several criteria or attributes that are taken into consideration in the decision. There are various methods in the decision-making approach, some of which are Fuzzy in Vukasović et al. (2021) [11], DEMATEL in Govindan et al. (2016) [12], Delphi in Balfaqih et al., (2016) [13] and AHP, which is a decision-making method with several criteria. hierarchically, so that it can be determined based on ranking [10], [14]. According to Oguztimur (2015) [10], AHP can make choices on a priority or ranking basis with several criteria measured on a reciprocal scale. Another thing that makes AHP have advantages is that it makes the choice of solutions measurable relative to one another. Subjective and objective scales are measured on a reciprocal priority scale, and can measure the consistency of choices. According to Saaty (2008), everything an individual does, whether consciously or unconsciously, is the result of a decision, which implies that the information obtained by each individual will have an impact on that decision.The Analytic Hierarchy Process (AHP) method helps individuals to sort information that is useful in making decisions. AHP maps the information obtained in a mathematical equation so that it can provide a weighting for the information.

Determining major problems caused by credit card distribution with a Pareto chart, this paper uses 1 year historical data of credit card delivery in Indonesia prior to 2020. To pinpoint the cause of the delivery failures, qualitative methods were used to collect data needed for problem brainstorming in a cause-effect diagram. AHP is then used to determine which problems require a higher priority level of resolution than others.

3 Findings

3.1 Flow Process Analysis

The purpose of this study is to establish priorities for solutions to reduce credit card delivery failures by banking firms.Quality management tools are combined with multi-criteria decision making tools that use the Analytic Hierarchy Process (AHP) to find these priorities. Quality management tools used were Pareto diagrams to determine major problems, and cause-effect diagrams to help us determine the best possible solutions for each root cause. As a banking services company, PT ABC has a different business segmentation, namely credit cards.Using an integrated system, PT ABC performs a credit card customer acquisition process until it is accepted by the customer through the process described in the following figure 1.

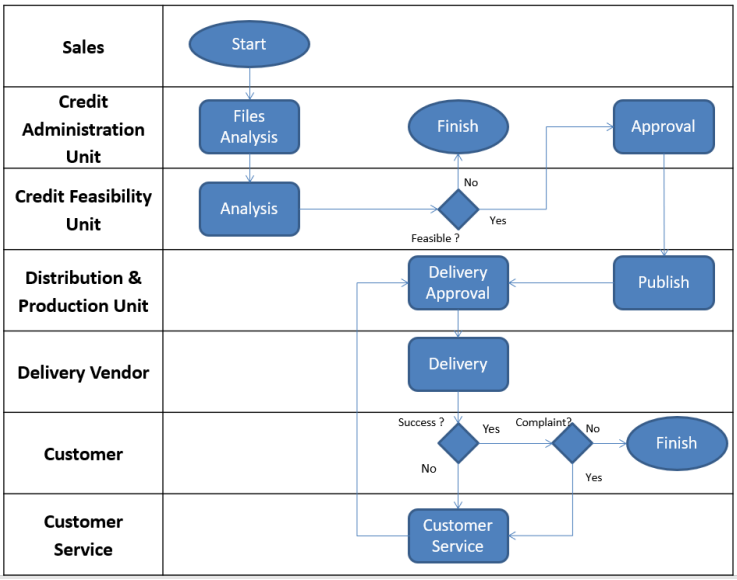

Fig. 1. PT ABC Performs a Credit Card Customer

Internally at PT ABC, new credit card applications are made by branch units and sales units. Branch units make customer acquisitions by utilizing internal personnel such as tellers, customer service, and company account officers who have been specially trained in the credit card application process that is inserted into the branch's daily operational services. Meanwhile, the acquisition of new customers and credit cards is carried out internally and externally by using multi-channel acquisitions, such as telemarketing and direct selling. Submissions from both units are then verified in terms of the feasibility of receiving credit card facilities and customer correspondence data to be further forwarded as print approval and delivery to the next unit.

According to Hwang et al. (2008) [15], one of the components of measuring a company's ability at a fundamental level is the reliability attribute in its element, perfect order fulfillment.PT ABC has a problem with failed delivery, which is an element of perfect order fulfillment reliability which is marked by the high number of credit card delivery failures of more than 10% every month from the total average of 100,000 credit card shipments. Based on the credit card application workflow, problems with delivery were detected in the process carried out by the delivery vendor, in this case, the delivery courier. PT ABC has segmented the reasons for sending credit cards with 11 codes used in the credit card delivery system. This aims to facilitate the search for problems that occur in shipping.

3.2 Problem Analysis

Failure to send credit cards by delivery couriers causes bank customer complaints to be made to Customer Service. Furthermore, the complaint will be re-submitted, which can incur additional costs and additional effort for the company to send credit cards to customers. Batarliene & Jarašuniene (2017) [16] explained that inaccuracy in choosing 3PL or improper processing can lead to customer dissatisfaction and a decrease in cooperation between companies in the long term.

Firstly, by using historical data of credit card delivery failures in the last 1 year prior to 2021. This historical data was plotted on a Pareto diagram, summed, and converted into a frequency ratio by dividing the cumulative frequency of each code by the total frequency.This data generates a graphical representation of the cumulative problem at 90.17%, which is the threshold that this paper wishes to solve using pareto analysis and limiting it to only five categories.These 5 categories were customer address relocated (R-1), address invalid (R-2), customer not recognized (R-4), empty houses during the daytime (R-6), and an uncategorized kind of failure (R-10). The main cause of delivery failures was R-1 with the customer's address relocated from discussion to the firm, which was caused by a credit card holder's 4-year renewal period.

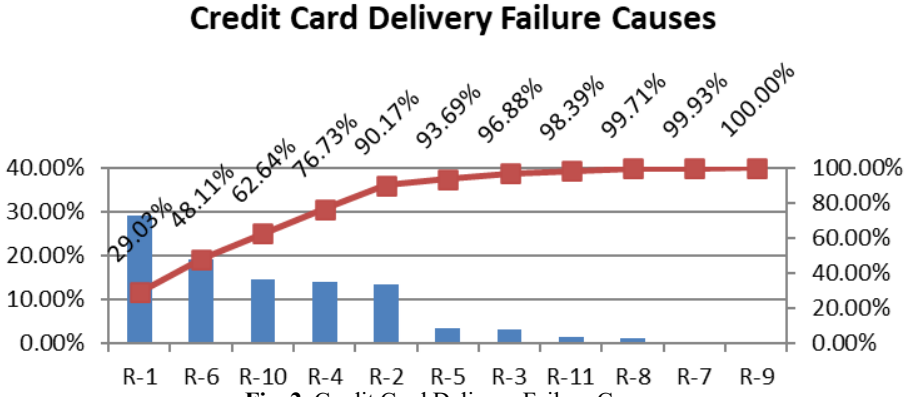

Fig. 2. Credit Card Delivery Failure Causes

Secondly, these delivery failure causes were mapped into a cause-effect diagram to determine their root causes with the help of management analysis in quality control. These were plotted on a table, and the best solution for each problem causing credit card delivery failures was determined.The operational team of ten people, including two middle managers and one higher-level manager, discussed solutions in a Focus Group Discussion (FGD).These issues are then classified into five solutions for reducing the 90.17% of delivery failure causes identified in the table 1.

Table 1. Delivery Failure Causes Identified

Root Cause (RC)	Solutions
1	Notification before delivery
2	Phone number and redelivery attempt by 3PL
3	Address input improvement
4	Managing 3PL capacity and allocation
5	3PL in depth evaluation

Based on the analysis, we have five solutions to fix delivery failures in banking firms.For a banking firm to execute in sequence, priorities should be determined in order to increase the problem-solving focus. AHP was used to determine priorities during this process.Through the analytical hygiene process method, weighting of the return completion criteria is carried out in

completing the research objectives, namely improving the success of sending credit cards as described in the figure.

3.3 Prioritizing Solution

There are 5 proposed solutions that will be compared with 4 main criteria, namely the weight of the reasons for returning, the time to complete the project, the cost of project completion, and the probability that the project can be completed. These four criteria were obtained through interviews with the head of affairs and the distribution team so that they could determine the priority of working on solutions in daily operations.

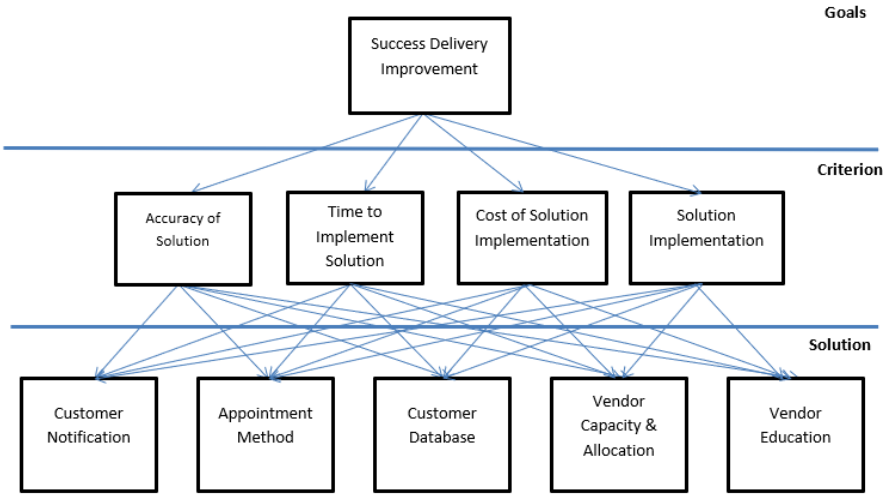

Fig. 3. The Priority of Working

The explanation of the four criteria is as follows:

a) Pareto solution to the problem (K1) - This criterion is the value of the solution to the problem measured by the root cause associated with the return reason code. The total value of the five solutions discussed in this study is 90.17% if all of them are successfully carried out by PT. A B C.

b) Solution implementation time (K2) - This criterion represents the length of time that the solution can be implemented internally or externally. Measured through the experience of the performance of the distribution team on the type of solution or the length of time to complete a project through paired comparisons

c) Solution implementation costs (K3) - This criterion represents the costs that are estimated to be incurred in implementing the solution internally as well as externally by the company. Criteria are measured through the experience of the performance of the distribution team on the type of solution or the length of time to complete a project through paired comparisons.

d) Ease of implementation of the solution (K4) - This criterion is the ease with which a solution can be implemented and mapped so that the objectives of the solution can be fully achieved. Measurements are made through the performance experience of the distribution team on the type of solution or the length of time for completion of a project

through paired comparisons. Matching these criteria and solution, we can imply the diagram by hierachy process as follow.

The executors of PT. ABC obtained a rating scale of four predetermined criteria for the problem of successful credit card delivery based on interviews and questionnaires.Processing using the excel template "AHP calc" made by Goepel (2012) [17] based on the Analytic Hierarchy Process calculation, Saaty (2008) [18] obtained weighting as shown in the table 2.

Table 2. PT. ABC Obtained a Rating Scale

	Criterion	Comment	Weights	+/-
1	K1	Accuracy of Solution	14.4%	3.4%
2	K2	Time to Implement Solution	19.3%	2.4%
3	K3	Cost of Implementation	18.7%	2.4%
4	K4	Ease of Solution Implementation	47.6%	9.2%

The weighting results show that the criteria for an easy solution to be applied (K4) have the highest weight with a value of 47.6% with a deviation of 9.2%. This shows that the main priority in solving the problem of successful delivery is dominated by the ease of implementing solutions to problems both internal and external to the company. Then, at the point of time for implementing the solution (K2), it gets a value of 19.3% with a deviation of 2.4%, which shows that the second priority in solving the problem is the time to work on the solution. Then, in the third order, is the cost of implementing the solution (K3) with a weight of 18.7% with a deviation of 2.4% and, finally, the Pareto solution to the problem (14.4%).

Overall, AHP has a consistency ratio of 1.7% with a tolerance limit of 10%. A weighted measurement is acceptable, so that the weighting results are consistent. Based on these results, the search for solution priority can refer to the weight of the criterion by performing a pairwise comparison of the solutions against each criterion. Comparing these pairwise comparisons of each criterion with solutions will receive the best priority.

3.4 Pareto of implementation of the solution

Determining the weighting of the criteria, then the weighting of the Pareto solution is carried out qualitatively through historical data on the reasons for credit card shipment returns. The weighting is shown in the following table.

Table 3. The Weighting of The Pareto Solution

	Criterion	Comment	Weights
1	S1	Return Notification	52,9%
2	S2	Appointment Attemp	16,7%
3	S3	Address Database Input Improvement	21,8%
4	S4	Vendor Capacity & Allocation	2,1%
5	S5	Vendor Education	6,4%

After weighting through the quantitative Pareto results on the average reasons for returns in 2020, the solution for improving the delivery notification (S1) has a value of 52.9%. These results show that applying the S1 solution can solve the return problem for 52.9% of the overall reasons for the return. The results were followed by internal coordination for process

improvement (S3) with a score of 21.8%, giving a telephone number and resending by courier (S2) at 16.7%, conducting education & evaluating couriers (S5) at 6.4%, and finally adjusting the capacity & courier allocation (S4) of 2.1%. Overall, the Pareto results show the composition of the solution to the settlement of the reasons for the return, which, at the final stage, will be compared with the matrix value of the 4 predetermined criteria.

3.5 Time of implementation of the solution

Based on the AHP commissioner and the implementer of PT, ABC obtained a consistency ratio of 1.7% with a tolerance limit of 10%, so the results are consistent and can be used. This research focuses on the priority of implementing solutions so that all solutions will eventually be implemented to achieve an overall improvement in value compared to the time of implementation of the solution.

Table 4. Time of Implementation of The Solution

	Criterion	Comment	Weights	+/-
1	S1	Return Notification	8.9%	1.5%
2	S2	Appointment Attemp	22.5%	2.5%
3	S3	Address Database Input Improvement	11.4%	2.0%
4	S4	Vendor Capacity & Allocation	34.4%	8.9%
5	S5	Vendor Education	22.8%	5.2%

The weight of capacity adjustment & courier allocation (S4) has the highest value with a value of 34.4% and a deviation of 8.9%. This shows that the S4 solution has the shortest solution implementation time, compared to other solutions. This is shown in the following table. Then, followed by education & evaluation of the courier (S5), and giving a telephone number & trying to resend the courier (S2). Criteria S2 compared to S5 has a higher probability of weighting the solution completion time because it has a narrower deviation. The internal coordination solution for improving the address inputting process (S3) and delivery notifications (S1) has a sorting based on the weights obtained in the fourth and fifth order.

3.6 Cost of implementation of the solution (K3)

Based on the AHP questionnaire for the implementers of PT, ABC obtained a consistency ratio of 3.4% with a tolerance limit of 10%, so the results are consistent and can be used. This research focuses on the priority of implementing solutions so that all solutions will eventually be implemented to achieve an overall improvement in value compared to the cost of implementing the solution. Measurements are not carried out quantitatively for the scale of costs but the historical experience of the respondents at AHP.

Table 5. Cost of implementation of the solution

	Criterion	Comment	Weights	+/-
1	S1	Return Notification	7.4%	2.3%
2	S2	Appointment Attemp	17.1%	6.8%
3	S3	Address Database Input Improvement	21.8%	3.3%
4	S4	Vendor Capacity & Allocation	16.8%	4.3%
5	S5	Vendor Education	36.8%	7.8%

The weight of conducting education & evaluation for couriers (S5) has the lowest cost scale based on AHP with a weight of 36.8%. This is because the downward adjustment process tends to be carried out with minimal costs based on the experience of the respondents. Then, followed by improvement of internal processes (S3) with a weight of 21.8% because the customer data acquisition process is considered to have costs that are more difficult to measure but can be carried out internally by the company. This was followed by giving a telephone number and the initiative to resend it by a courier (S2). This solution is in the third position because of the attention to the risk of handling customers by improper couriers. Then the capacity adjustment & courier allocation is in the 4th position with a weight of 16.8%. This is because every 3PL that cooperates with the company has different shipping costs. Finally, the improvement of delivery notification (S1) is the biggest cost concern because it requires additional processing and notification costs.

3.7 Ease of implementation of the solution (K4)

Table 6. Ease of implementation of the solution

	Criterion	Comment	Weights	+/-
1	S1	Return Notification	21.3%	1.0%
2	S2	Appointment Attemp	24.7%	4.7%
3	S3	Address Database Input Improvement	10.7%	2.8%
4	S4	Vendor Capacity & Allocation	21.3%	3.4%
5	S5	Vendor Education	22.1%	5.6%

Based on the AHP questionnaire for the management of PT, ABC obtained a consistency ratio of 1.7% with a tolerance limit of 10%, so the results are consistent and can be used. This research focuses on the priority of implementing solutions so that all solutions will eventually be implemented to achieve an overall improvement in value compared to the ease of the solution to be implemented. Factors that support the measurement criteria, namely the experience of each respondent in the application of solutions to internal and external companies.

This ease of implementation show that external effort to 3PL is more likely to be choosen by company. The reason that delivery vendor were used and more strictly regulated with cooperation agreement. Internal change or fixing regulations, in contrast to external effort, is difficult because this problem is likely to be less significant to business and acquisition units.

We can conclude from this calculation that granting 3PL handphone number access is more likely to be easily implemented than changing internal regulations. Internal changes in the development notification system prior to delivery were deemed the second best option, as adding modules to an existing process is perceived to be easier than changing the core process. Customer data and card acquisition, on the other hand, are the least easily deployed methods, most likely due to a lack of recent data validation from sales with high competition.

4 Conclusion

The need for a reliable Supply Chain Management (SCM) effort to provide the best service to customers is the key to developing the banking business in the credit card sector. Through in-depth analysis using the cause-effect diagram method and Pareto analysis of shipping problems, solutions are obtained that can be applied by companies to repair credit card delivery failures.

The Pareto diagram reveals the main problems experienced by PT ABC, namely customers changing addresses (R1); the house is empty or the customer is not in place (R6); reasons for working from home / rarely in place / rejected or in other categories (R10); the customer's name is not known at the delivery address (R4); and finally, the delivery address is not clear or complete (R2). The cause-effect diagram describes that PT ABC's delivery problems were caused internally and externally and obtained 5 solutions that the company could implement, including improving delivery notifications; giving the courier a phone number and trying to resend it; improvement of the cardholder input process at the time of submission; adjustment of courier capacity and allocation; providing education to couriers. The combination of Pareto diagrams and cause-effect analysis can find solutions to the problem of the low success rate of delivery by PT ABC in depth.

Improving the performance and problems of PT ABC's management necessitates a work priority of implementing solutions to the anticipated problems.The Analytic Hieracy Process (AHP) as a method has the advantage of comparing priorities relative to each other subjectively and objectively, which can help PT ABC to find priorities for implementing solutions. Based on the AHP, the priority scale of improvements made by the company in sending credit cards is in the first and second order of external repairs by the company, namely delivery by delivery couriers. Then, the rest of the priority improvements can be made internally by the company. This is shown because the credit card delivery unit has full control over the external vendor, while internally there is a conflict of interest over the product being shipped.

The problem faced by PT ABC is the high rate of credit card delivery failures, with a significant value of 10% of the total monthly shipments. Analyzing the problem comprehensively can be done by PT ABC through the translation of the data on the reasons for the return or delivery failure using a Pareto diagram. Furthermore, in-depth analysis by solving these problems and describing them using a cause-effect diagram PT ABC can find solutions that the company can do to fix the problem. Companies can use the AHP method to identify their work priorities and schedule them into short-term and medium-term improvement plans.Applying quality tools to analyze problems and AHP to find priority solutions, PT ABC is expected to reduce the delivery failure rate to 1% of the total shipments.

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