

# Evaluation of Expedition Performance in Ensuring the Smooth Process of Parts Distribution Process at PT Mitra Bisnis by Using the Analytic Hierarchy Process (AHP) Method

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**Abstract:-** This study aims to find out how much the level of the role of the expedition in ensuring the smooth distribution of spare parts that occur at PT Mitra Bisnis. In the process of parts distribution, PT Mitra Bisnis has collaborated with three shipping companies, namely: PT Pelita Sukses Logistic, PT Maxxi Logistic and PT Raih Sukses Abadi. In the process of spare parts distribution, PT Mitra Bisnis has set four criteria that must be met and required in a contract, namely: Lead Time, Tariff, Report Monitoring, and Term of Payment. This research is quantitative by using the Analytic Hierarchy Process method. The sample taken in this study amounted to 20 respondents who worked in the logistics and supply chain, especially the warehouse, transport and inventory. From the results of this research obtained the best expedition rank among the three based on these four factors, namely: 1) PT Raih Sukses Abadi, 2) PT Maxxi Logistic, and 3) PT Pelita Sukses Logistic. While based on the order of priority criteria, PT Mitra Bisnis prioritizes: 1) Lead Time of 31.50%, 2) Monitoring Reports of 30.00%, 3) Tariff of 26.60%, and 4) Term of Payment of 11.90%.

**Keywords:-** Dealer, Parts, Lead Time, Report Monitoring, Tariff, and Term of Payment.

## I. INTRODUCTION

Today there's many companies are competing in strengthening distribution channels to create product availability in the market so that there is no empty for. Ensuring the availability of products in the market has become a major obligation for the parent company or brand holder as a form of guarantee of warranty or after-sales service to all customers wherever located. In strengthening the distribution channel, the company will certainly maximize the distribution process quickly and on time, so that the goods or services can be received in accordance with the expectations and desires of customers. In the distribution process the company can do the

distribution process itself or can use the third party / 3PL (third party logistic) outsourcing. A 3PL company is a company that provides logistics services outsourcing services to companies or individuals to perform one or more functions within the supply chain management. The 3PL company has a very important role because it will largely determine the success of the delivery process from the beginning to the end, starting from the collection process to the delivery process to the destination.

PT Mitra Bisnis is a company engaged in the automotive sector, which is a brand holder of the FORD vehicle brand newly appointed by the previous Ford brand holder, PT Ford Motor Indonesia. Nearly two years already PT Business Partners continue and continue after-sales service for Ford Genuine Parts throughout Indonesia. In ensuring the availability of these parts, PT Business Partners have collaborated with thirty-four distributors located throughout Indonesia. In the process of spare parts distribution, PT Mitra Bisnis has set four criteria that must be met and required in a contract by the expedition, namely: Lead Time, Tariff, Report Monitoring, and Term of Payment.

To support the process of distributing spare parts to all distributors, or better known as dealers, PT Mitra Bisnis collaborated with three expedition parties namely PT Raih Sukses Abadi, PT Pelita Sukses Logistic and PT Maxxi Logistic. The three shipping companies only deliver spare parts outside Jabodetabek, because for dealers or distributors located in Jakarta, Bogor, Depok, Tangerang and Bekasi (Jabodetabek) they will take the spare parts to PT Mitra Bisnis warehouse.

Based on PT Mitra Bisnis' internal data during the January-July 2018 period, the spare parts distribution process carried out by the three expeditions has not yet made a significant contribution, it is known based on the delay data in figure 1 below.

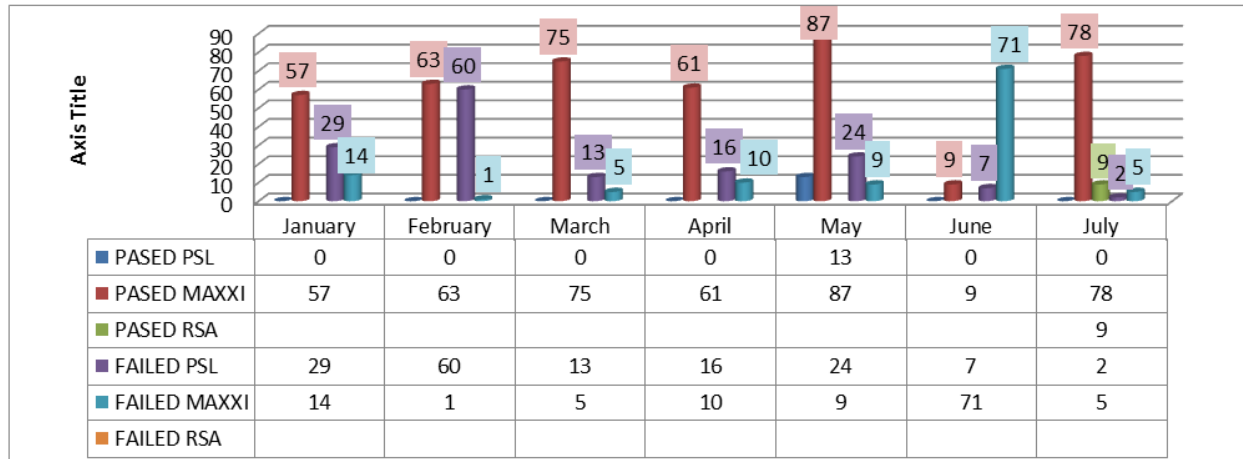


Fig. 1:- Data Delayed Distribution Process  
Source: PT Mitra Bisnis (2018)

From the data in figure 1 it can be seen that during the January-July 2018 period, the total delays committed by PT Pelita Sukses Logitic (PSL) were 151 times and the total delays done by PT Maxxi Logistic (MAXXI) were 115 times, while PT Raih Sukses Abadi (RSA) has never been late because it was only given the trust to make deliveries at the beginning of July by PT Mitra Bisnis. Based on the background and data above, the authors take a study entitled "Evaluation of Expedition Performance in Ensuring the Smooth Process of Parts Distribution Process at PT Mitra Bisnis by Using the Analytic Hierarchy Process (AHP) Method".

**II. RESEARCH OBJECTIVES**

The objectives of this study are as follows:

- Knowing the priority order of criteria set by PT Mitra Bisnis.
- Knowing the best expedition in PT Mitra Bisnis that is eligible for the long term.
- Knowing whether the process of sending spare parts at PT. Business partners are effective and efficient.
- Knowing the main factors that cause delays in the process of sending spare parts at PT Business partner.
- Knowing the actions of PT Business Partners in dealing with delays in the distribution process of spare parts.

**III. LITERATURE REVIEWS**

*A. Performance Evaluation*

According to Hanggraeni (2012: 121) Performance evaluation is a process in which a company evaluates and evaluates the performance of individuals or organizations on each job that is their responsibility. Furthermore, Hanggraeni (2012: 122) states that performance appraisal has three main elements, namely performance standard setting, performance measurement, and feedback. While Robbins on Hanggraheni (2012: 121) said that several benefits of performance appraisal

are 1) making decisions in HR management such as promotion, transfer, and dismissal, 2) identifying the need for training and development, 3) validating the selection and development program, 4) providing feedback back to the worker for his performance, and 5) the basis for determining the remuneration allocation decision.

*B. Third Party Logistics Company (3PL)*

According to kargo.co.id (2018) Third Party Logistics (3PL) is a company that provides logistics services outsourcing services to companies or individuals to perform one or more functions within supply chain management. According to lincgrp.com (2016) 3PL companies can provide solutions and manage all needs such as trucking, warehouses and so on. The 3PL companies include freight forwarders, courier companies and online logistics. To qualify as a 3PL company, the standard that must be owned by a 3PL company is to have loading-unloading. Warehousing, distribution of goods, arrangement of documents and travel documents, and arrangements for transportation modes. With the 3PL company, the parent company will get benefits such as the use of new technology, focus on business, and flexibility obtained from the 3PL company.

*C. Distribution Management*

According to Walter on Swastha (1990:286) Distribution management is the process of moving a product or service that must be developed and managed in accordance with the company's vision and mission in a particular environmental condition and in accordance with the needs and desires of consumers. In manufacturing activities, distribution plays an important role in guaranteeing products that are marketed so that the products are available equally in each region. If a product is produced that is not evenly distributed that will make the public or consumers have difficulty in getting the product.

There are two (2) types of activities to reduce the risk of distribution, namely single distribution or multi distribution. Each type of activity both single distribution and multi distribution has advantages and disadvantages. The advantage of a single distribution is that it facilitates supervision in distribution, for the weaknesses of a single distribution is the limitations in distribution. While the advantages of multi-distribution is that product distribution is carried out more quickly by many distribution channels, for the weakness of multi-distribution one of which will be many conflicts between distributor members or agents.

*D. Distribution Channel*

According to David A. Revzan on Swastha (1999:3) distribution channel is a flow from the flow of goods passed from producers to intermediaries until finally reaching consumers as users. While according to the American Marketing Association (AMA) on Swastha (1999:4) the distribution channel is an organizational structure of the company, both from within the company and from outside the company consisting of large traders / distributors, agents and retailers.

According to Daryanto (2011:90) distribution channels are channels that used by producers to distribute it goods to consumers. Either transfer of goods or the ownership rights. According to Suryanto (2016:6) Distribution management has 2 systems in circulation namely old paradigm and new paradigm. In the old paradigm explained that the determination of sales targets for each distribution channel is more producer oriented. In this old paradigm the producer (principal) has the authority in carrying out and compiling requests from partners and their teams in distribution. The key to successful distribution is SCP (spreading, coverage, and penetration). While in the new paradigm the determination of demand and sale of products or services comes from the needs of customers (users). So the producer is only as a means of fulfilling a number of products or services according to customer demand. The producer must arrange the logistics. Logistic success is Difotef (delivery in full on time error free).

*E. Analytic Hierarchy Process (AHP)*

According to Saaty (1993) Analytic Hierarchy Process (AHP) is a method that details a complex or unstructured situation into components and then organizes parts or variables of these components into a hierarchical arrangement, giving numerical values to these considerations for assigning variables which one has the highest priority. Furthermore, Saaty said that the Analytic Hierarchy Process (AHP) is useful in complex problems that are not structured, do not have enough written data, such as problems: planning, determining alternatives, prioritizing, selecting policies (policy), source allocation, determining needs, forecasting results, system design, recognition of performance, optimization in problem solving. As an analytical tool, analytic hierarchy process (AHP) has several advantages (Saaty, 1993:25) as follows:

unity, complexity, interdependence, hierarchical arrangement, measurement, consistency, synthetic, bargaining, consensus research and process repetition. While Kadarsah and Ramdhani (1998:131) state that AHP has advantages including: a hierarchical structure, calculating validity to the tolerance limit of inconsistencies of various criteria and alternatives chosen by decision makers, and calculating the durability or resilience of the output of decision-sensitivity analysis.

*F. Geometric Calculation Mean*

Assessments conducted by many participants will produce opinions that differ from one another if no consensus is reached. According Saaty (2008:87) The AHP method only requires one answer for one comparison matrix, so all answers from participation must be averaged for that. Saaty recommends a leveling method with a geometric mean. Geometric mean states that if there are n participants through pairwise comparisons then there are n numerical answers / values for each pair, to get one particular value from all of these values, each value must be multiplied with each other then the result of multiplication with 1 / n.

*G. Drafting the Problem Hierarchy Structure*

Saaty (1993:17) mentions that the preparation of a problem hierarchy is a step to defining complicated and complex problems so that are clearer and more detailed. The problem hierarchy is structured to help the decision making process that takes into account all the decision elements involved in the system. The decision hierarchy is prepared based on the views of those who have expertise and knowledge in the field concerned, the decision to be taken is made as a goal which is elaborated into more detailed elements to reach a stage that is most operational or measurable. The terms used in AHP for hierarchical level are: 1) Hierarchy level 0 is the goal, 2) Hierarchy level 1 is criteria, 3) Hierarchy level 2 is sub criteria, and 4) Hierarchy level 3 is alternative. The hierarchical structure in this study is contained in figure 2 below.

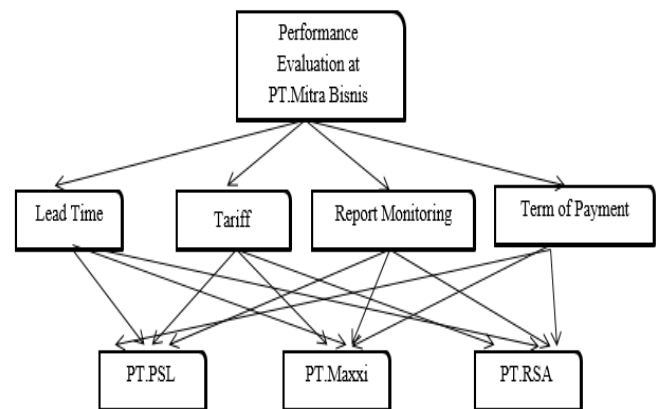


Fig.2:- Hierarchy Structure  
Source: PT Mitra Bisnis (2018)

H. Priority Preparation

Saaty (1993:17) states that the priority of the elements criteria can be seen as the weight or contribution of these elements to the decision making goals. AHP conducts element priority analysis using the pairwise comparison method between two elements so that all the elements are included. This priority is determined based on the views of experts and interested parties in decision making, both directly (discussion) and indirectly (questionnaire).

I. Hierarchy Consistency Testing

Saaty (1993:17) states that the consistency of the answers of respondents in determining the priority of elements is a basic principle that will determine the validity of data and the results of decision making. In principle, the hierarchical consistency test is to multiply all the values of the consistency index (CI) with the weight of a criterion that becomes a reference in a paired comparison matrix and then sums it up. The amount is then compared with the value obtained in the same way but for a random matrix. The end result is a parameter called the Consistency Ratio of Hierarchy.

IV. METHODELOGY

This research is quantitative by using the Analytic Hierarchy Process (AHP) method. Analytic Hierarchy Process (AHP) method is a method that details a complex or unstructured situation into components and then organizes parts or variables of these components into a hierarchical arrangement, giving numeric values to this consideration to determine which variables has the highest Priority (Saaty, Thomas L, 2008). By using the Analytic Hierarchy Process method the researcher can find out the main problems that occur at PT Mitra Bisnis so that they can be resolved, especially the problem of delays in the process of sending spare parts to all distributors in the territory of Indonesia. In addition, using PT Mitra Bisnis' Analytic Hierarchy Process method can take concrete actions.

In this study the author wants to measure variables or criteria set by PT Mitra Bisnis and the extent to which all of these criteria have been met by all shipping companies that are still actively cooperating with PT Mitra Bisnis, so that the spare parts distribution process can run well smoothly and effectively also efficient. The predetermined criteria consist of: Lead Time, Tariff, Report Monitoring and Term of Payment. The population in this study are all employees of PT Mitra Bisnis, amounting to 40 people, while the sample taken in this study amounted to 20 respondents who worked in the logistics and supply chain, especially the warehouse, transport and inventory.

V. RESULT

Based on the calculation of the Geometric Mean with the Analytic Hierarchy Process method to determine the comparison of criteria set by PT Mitra Bisnis, a lead time result of 31.50% as priority 1, monitoring report as large as 30% as priority 2, a tariff of 26.6% as priority 3, and term of payment of 11.9% as priority 4. The results can be seen in figure 3 below.

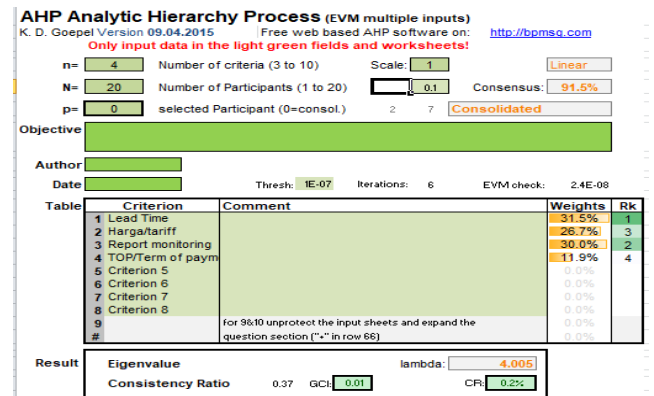


Fig.3:- Calculation Results for Comparison of Criteria  
Source: In Researchers (2018)

Based on the Geometric Mean calculation using the Analytic Hierarchy Process method to determine alternative priorities for lead time at PT Mitra Bisnis, PT RSA results obtained by 47% as priority 1, PT MAXXI as high as 30.4% as priority 2, and PT PSL by 22.6% as priority 3. These results can be seen in figures 4 below.

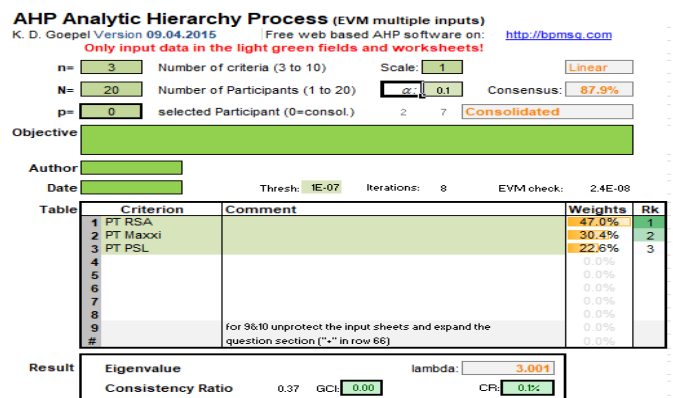


Fig.4:- Alternative Priority Calculation Results for Lead Time  
Source: In Researchers (2018)

Based on the calculation of the Geometric Mean using the Analytic Hierarchy Process method to determine alternative priorities for tariffs at PT Mitra Bisnis, PT PSL results are obtained for 39.9% as priority 1, PT MAXXI is 37.1% as priority 2, and PT RSA is 23% as priority 3. These results can be seen in figure 5 below.

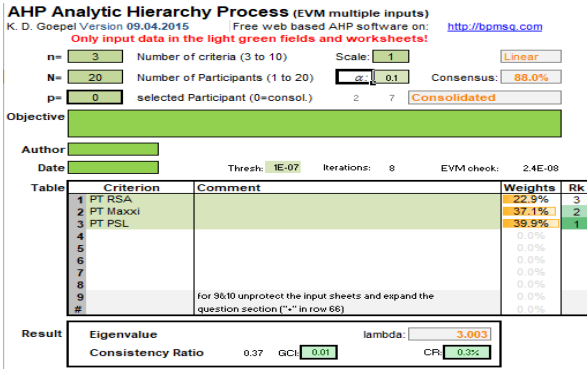


Fig. 5:- Alternative Priority Calculation Results for Tariff  
Source: In Researchers (2018)

Based on the Geometric Mean calculation using the Analytic Hierarchy Process method to determine alternative priorities for the monitoring report at PT Mitra Bisnis, the results of PT RSA were 54.2% as priority 1, PT MAXXI was 23.1% as priority 2, and PT PSL was 22.7% as priority 3. These results can be seen in Figure 6 below.

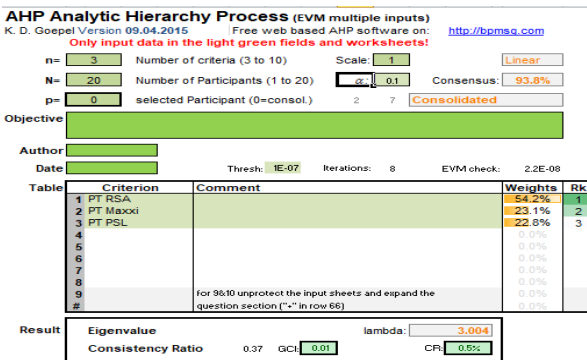


Fig. 6:- Results of Alternative Priority Calculations for Monitoring Reports  
Source: In Researchers (2018)

Based on the calculation of the Geometric Mean with the Analytic Hierarchy Process method to determine alternative priorities for the term of payment at PT Mitra Bisnis which results are obtained from PT RSA 45.8% as priority 1, PT PSL is 28.1% as priority 2, and PT MAXXI is 26.1% as priority 3. These results can be seen in figure 7 below.

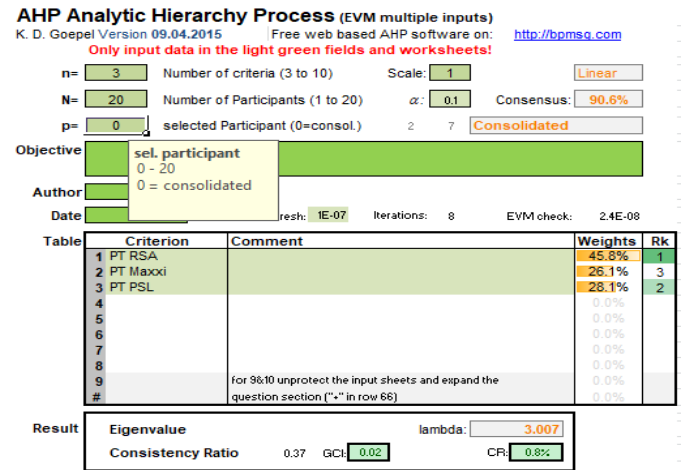


Fig. 7:- Alternative Priority Result for Term of Payment  
Source: In Researchers (2018)

Based on the results of research using the Analytic Hierarchy Process method, the global hierarchical structure of PT Multi Bisnis was obtained as shown in figure 8 below.

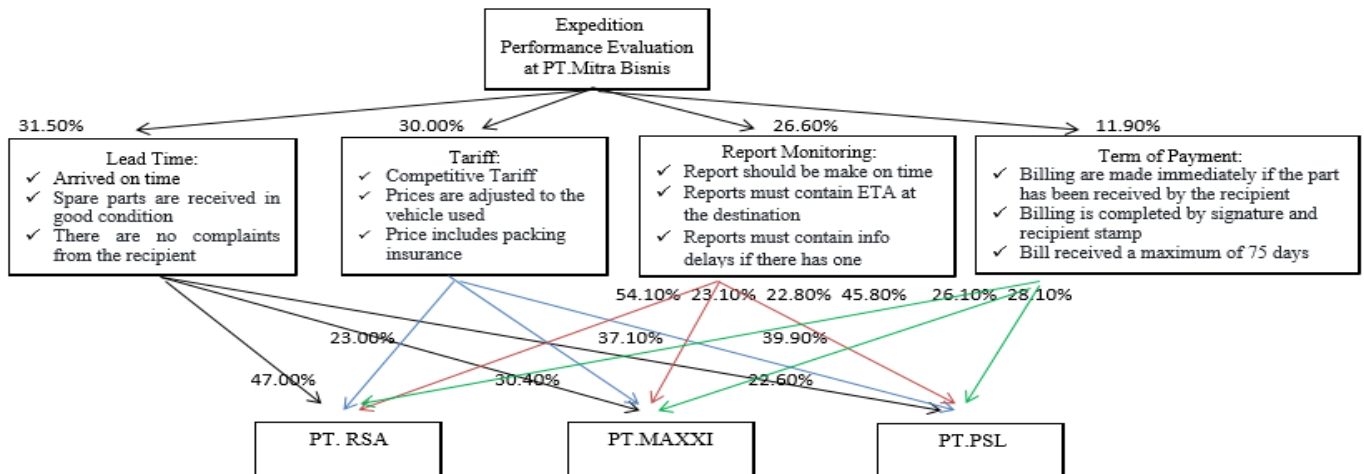


Fig. 8:- Global Hierarchy Structure of PT Mitra Bisnis  
Source: Result of Analytic Hierarchy Process (2018)

## VI. CONCLUSION AND SUGGESTIONS

### A. Conclusion

By looking at the results of the calculation of data processing using the Analytic Hierarchy Process (AHP) method, the following conclusions are obtained:

1) The Priority Order Criteria set by PT Mitra Bisnis are as follows:

- a) Lead Time with a percentage of 31.50%.
- b) Monitoring Report with a percentage of 30.00%.
- c) Tariff with a percentage of 26.60%.
- d) Term of Payment with a percentage of 11.90%

2) The rank of the best expedition company in PT Mitra Bisnis is as follows:

a) Based on Lead Time

PT Raih Sukses Abadi with a percentage of 47.00%.

PT Maxxi Logistics with a percentage of 30.40%.

PT Pelita Sukses Logistic with a percentage of 22.60%.

b) Based on Tariff

PT Pelita Sukses Logistic with a percentage of 39.90%.

PT Maxxi Logistic with a percentage of 37.10%.

PT Raih Sukses Abadi with a percentage of 23.00%.

c) Based on Report Monitoring

PT Raih Sukses Abadi with a percentage of 54.10%.

PT Maxxi Logistic with a percentage of 23.10%.

PT Pelita Sukses Logistic with a percentage of 22.80%.

d) Based on Term of Payment (TOP)

PT Raih Sukses Abadi with a percentage of 45.80%.

PT Pelita Sukses Logistic with a percentage of 28.10%.

PT Maxxi Logistic with a percentage of 26.10%.

So the order of Alternatives or the best overall expedition in PT Business partner is:

- a) PT Raih Sukses Abadi (Priority 1).
- b) PT Maxxi Logistic (Priority 2).
- c) PT Pelita Sukses Logistic (Priority 3).

3) The spare parts delivery process that has been running at PT Mitra Bisnis starting in 2018 was still not effectived and Efficient, because there were still many delays done by each expedition, this was indicated by the delay in each delivery month according to the data obtained.

4) The delay process is in accordance with information obtained from PT Mitra Bisnis sources that most of the problems are related to the problem of lead time which is not on time, does not match with the lead time info provided by the expedition at the beginning and this occurs because the expedition agent is not strong enough known in the destination area.

5) These the actions taken by PT Mitra Bisnis on the late delivery process by the shipping company are as follows:

a) If the shipping company delays the delivery, the management of PT Mitra Bisnis will contact the expedition in advance regarding the factors that causing the delay, if it is known and the cause is not due to force majeure factors, the management of PT Mitra Bisnis will reduce the shipping load to the expedition as consequence, even if there are still frequent delays, PT Mitra Bisnis will not

hesitate to blacklist the expedition or will not partner again (terminating the contract).

b) If the expedition company makes a delay in a row in a month the expedition company will be called by PT Mitra Bisnis for clarification, if the expedition cannot explain or strengthen their excuses about the delay process, PT Mitra Bisnis will cross out the name of the expedition in other words the expedition it will no longer be contracted (broken contract).

### B. Suggestions

To reduce the risk of late delivery of spare parts to all of these dealers, especially in areas outside Jabodetabek, PT Mitra Bisnis needs to take the following actions:

- 1) PT Mitra Bisnis needs to conduct periodic evaluations of all their expeditions.
- 2) PT Mitra Bisnis still must pay attention to the packaging process neatly, so that the spare parts are received in good condition (not damaged).
- 3) PT Mitra Bisnis should have a master price or rate for each destination area, so that each expedition does not set excessive tariffs.
- 4) PT Mitra Bisnis needs to do an evaluation, especially on tariffs or shipping costs, so that it can be used as a Long-term guide.
- 5) PT Mitra Bisnis must continue to pay attention to the handling of spare parts both for cheap and expensive category parts, in order to reduce the risk of damage.
- 6) Even though there is insurance covering the spare parts to be sent, PT Mitra Bisnis must always pay attention to both the amount of colly at the time of loading and also the condition of the parts.
- 7) PT Mitra Bisnis must have data on weight, dimensions for each shipment of spare parts, because the expedition will calculate the largest weight (both actual and volume) as a billing basis.
- 8) PT Mitra Bisnis must also pay attention to the spare parts that need to be repackaged by the expedition even though the expedition tariff includes the packing fee.
- 9) PT Mitra Bisnis must conduct an evaluation of the monitoring report which is always emailed by the expedition, whether it is appropriate regarding the number and volume of deliveries and whether if the monitoring report is on time.
- 10) PT Mitra Bisnis must request the expedition to update the monitoring report emailed 2 days before the estimated arrival (ETA).
- 11) PT Mitra Bisnis must pay attention to any factors that cause delays in delivery, and ask the expedition to always inform if there will be a delay, to minimize complaints from the destination dealer.
- 12) PT Mitra Bisnis, in order to strict the administration then asked the expedition to immediately conduct the billing after the spare parts have been received by the destination dealer.

- 13) PT Mitra Bisnis must pay attention to the completeness of documents in billing by the expedition for example: the main requirements for a receipt that has been signed and stamped by the recipients of the dealer in order to reduce risk in the future.
- 14) PT Mitra Bisnis has determined the expedition related to the length of invoice or billing that must be sent (maximum 75 days) from the date of delivery, if it exceeds from 75 days, then PT Mitra Bisnis will not make payments.

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