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ANALYSIS OF NEW AGENT SPRING ROLLS LOCATION TO IMPROVE PRODUCT SALES

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ABSTRACT

The lumpia dowo industry is an industry that produces spring rolls with various flavors and has 26 agents. However, with the COVID-19 pandemic, sales have decreased, so it is necessary to research the strategy of selling dowo spring rolls. One approach that can be done is to add new agents. The method used in this research is Analytical Network Process because this method can determine the best alternative agent location by displaying the ranking priority order. The results of this study indicate that there are several clusters, namely market potential, accessibility, labor, marketing reach, trust. The new agent has three alternative locations, namely Lamongan, Jombang, Bojonegoro, and Malang. The analysis results show that Jombang is the first best alternative with a value of 1, Lamongan 0.600, Malang 0.474, and Bojonegoro 0.423. So that by establishing a new agent in Jombang City, you can increase the sales of spring rolls.

Keywords: *ANP, Product Sales, Spring Rolls.*

1. Introduction

The spring roll dewo industry is a business in the culinary field located in the Lamongan district. Lumpia dewo is a typical snack from Lamongan Regency, whose sales have been almost over the region. Ilham Nugroho as the owner of the dewo spring roll industry, which was established in 2016 from year to year, the number of sales is increasing. The spring roll industry also has 26 agents spread across various cities. Lumpia dewo can innovate by providing various variants of spring roll contents. For the size of the spring roll itself, it is different from the spring rolls that are usually found on the market for the larger size of dewo spring rolls, which is 6 x 25 cm. for the taste variants, which consist of original chicken, original beef, spicy chicken, rendang, and pizza. Around 40% of spring roll production is market as frozen food for distribution in various cities. The number of requests itself depends on the target marketing of the product. The number of agent currently available is only one location, which is located on Jl. Andansari, Lamongan Regency. Several small agents are scattered in various cities, including Lamongan, Tuban, Bojonegoro, Jombang, Mojokerto, Surabaya, and surrounding areas. However, with the Covid-19 pandemic, sales have decreased, so it is necessary to research the dowo spring roll sales strategy. One strategy that can be done is to add new agents by determining the correct location.

Location is one of the critical factors in sales strategy, which is a significant challenge to assess accessibility, support activities, and market share (Kuka, 2018) . The decisions that must be taken have a substantial impact on the long-term logistics costs. In an investment, project decision contains a lot of risk and uncertainty. In location analysis, several functions can be applied in the business world, significantly affecting smooth running. One of them is the aspect of determining the new location. Defining the new site must pay attention to several elements, including competitiveness and determining a strategic business location. The strategy of choosing a strategic business is something that needs to be considered before opening a business. In a marketing strategy, it is the choice of a business location that affects the marketing success (Mittelstaedt et al., 2006). The more strategic the chosen business location, the higher the level of sales and the effect on business success. Choosing a business located close to the target market is one of the sales business strategies. Business development must be carried out in several alternative cities with

high sales levels to make it easier for consumers to get products. This alternative is based on data obtained from sales results in the last year and is the highest product uptake area. Therefore, it is necessary to research the analysis of determining the new branch of lumpia dowo in increasing product sales.

2. Literature Review

The Analytical Network Process (ANP) method is the proper method to use to select alternatives and is a derivative and improvement method from the Analytical Hierarchy Process (AHP) method (Reisi et al., 2018)(Khan & Ali, 2020). Using the ANP method can improve the weaknesses of the AHP method to make linkages between criteria or alternatives. The components of the ANP method consist of a control hierarchy, clusters, elements, relationships between elements, and relationships between groups. There are two types of linkage in the ANP method: the connection within inner dependence and the relationship between outer dependence. So ANP is a unique form of AHP. Determination of the criteria and sub-criteria of this study using the reference of previous research (Tang et al., 2017)(Banaeian et al., 2015). The criteria and sub-criteria attributes used are Accessibility (availability of transportation advice, travel time, and road quality), Cost (land rent, operational costs, and raw material costs), Environment (population density, socio-economic community, and crime rate), Infrastructure (availability of clean water, availability of electricity and availability of telephone networks), market potential (competitiveness, people's purchasing power, and product life span), and human resources (availability of labor, minimum wage for labor and quality of education).

3. Research Method

The method used in this research is Analytical Network Process because this method can determine the best alternative agent location by displaying the ranking priority order (Jharkharia & Shankar, 2007)(Khan & Ali, 2020)(Reisi et al., 2018)(Hidayat et al., 2019). Analytical Network Process (ANP) is a method that can calculate dependencies between hierarchical elements (Saaty, 2004).(Bayazit, 2006) This method is very suitable for providing performance appraisal that has many decisions, namely: basically can't be solved by Analytical Hierarchy Process (AHP) method. This study used three experts who are experts in their research fields do (Puspitasari & Ciptomulyono, 2011)(Reisi et al., 2018).

4. Results and Discussion

It is essential to determine the criteria and sub-criteria because it will be a reference for deciding alternative locations for new agent. The criteria and sub-criteria were obtained from previous research and obtained through interviews with experts in their fields. The criteria used in this research are Market Potential, Accessibility, Manpower, Reach, Recapitulation & Trust. A previous study also used Market Potential, Accessibility, Manpower, and Reach (Febriyanti et al., 2019; Sinaga, 2018). Choosing the location of a business (company) dramatically affects the risks and profits of the company as a whole because the place will significantly affect fixed costs and variable costs from the medium to long term (Febriyanti et al., 2019). From the selection results of the selected criteria, there are also several more specific Sub-criteria to be used as a reference in the preferred alternative locations. The following are the results of the identification of criteria and sub-criteria for this study

Table 1. Identification Results of Criteria and Sub Criteria

Criteria	Sub Criteria
Market Potential	purchasing power, competitiveness
Accessibility	location close to residential, location close to highway
Labor	labor availability, transportation costs
Reach	marketing target,
Recapitulation and trust	cooperation in the long term, the accuracy of the delivery process

Source: Adjusted by the researchers, 2021

The data processing using the Analytical Network Process (ANP) method describes the network between criteria, sub-criteria, and alternatives to obtaining the relationship between the three and making the ANP network using the help of the super decisions software. The ANP network can be concluded that the criteria, sub-criteria, and alternatives have a relationship or are interrelated. In determining the location of agents, there are selected criteria, including market potential, accessibility, workforce, reach, recapitulation & trust. All criteria, sub-criteria, and alternatives are known. Pairwise comparisons are made between criteria, sub-

criteria, and alternatives by comparing the importance level values between criteria, sub-criteria, and alternatives to get the priority weight value of each criterion, Sub-criteria criteria, and alternatives. The value of the importance level of each criterion, sub-criteria, and the alternative is obtained from filling in the pairwise comparison questionnaire that the expert has filled in.

Analysis of Alternative Priority Weights for Site Selection

The results of the questionnaire obtained with an interview system with experts can be seen from the priority weight value of each alternative in each sub-criteria. The value obtained is processed using the Analytical Network Process method with the help of the super decisions software. The following are the results of each alternative in each sub-criteria:

Public purchasing power of products

It can be seen that the results of the weighting of each alternative on the sub-criteria of people's purchasing power for the product can be seen in figure 1.

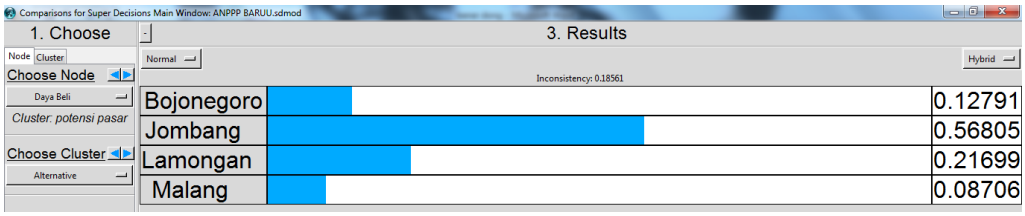

Figure 1. The results of the weighting for each alternative in the sub-criteria of people's purchasing power (Source: Primary Data, Processed with Super Decisions Softwere 2.10, 2021)

From Figure 1, it can be seen that the priority order of the weight values that have a higher value for determining the location of new agentks in the sub-criteria of public purchasing power for the priority is Jombang (0.56805). The second priority is Lamongan (0.21699), the third priority is Bojonegoro (0.12791), and the last priority is Malang (0.08706). From these results, the Jombang alternative for people's purchasing power is very high for the product. Therefore, to determine the location of the new agentk in the sub-criteria of the people's purchasing power, it is located in Jombang.

Competitiveness

It can be seen that the results of the weighting of each alternative in the competitiveness sub-criteria can see in figure 2.

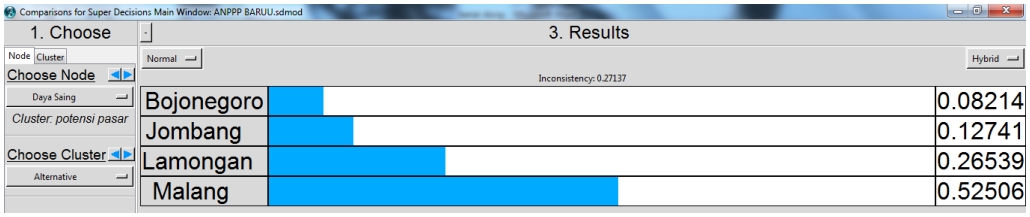

Figure 2. The results of the weighting for each alternative in the competitiveness sub-criteria (Source: Primary Data, Processed with Super Decisions Softwere 2.10, 2021)

From Figure 2, it can be seen that for the sub-criteria of competitiveness against products that have the highest competitors, namely the first order in Malang (0.52506), the second level is Lamongan (0.26539), the third level is Jombang (0.12741), and the last is the power level. Low competitiveness, namely Bojonegoro (0.08214). From the results of the priority value, it can be seen that for determining the location of a new agentk, it is more appropriate to establish if the alternative has little or low competitiveness. Therefore, the location of the new agent based on the sub-criteria of competitiveness is more appropriate if the agent's location has low competitiveness.

Location close to settlement

We can see the results of the weighting of each alternative in the sub-criteria for location close to settlements can be seen in figure 3

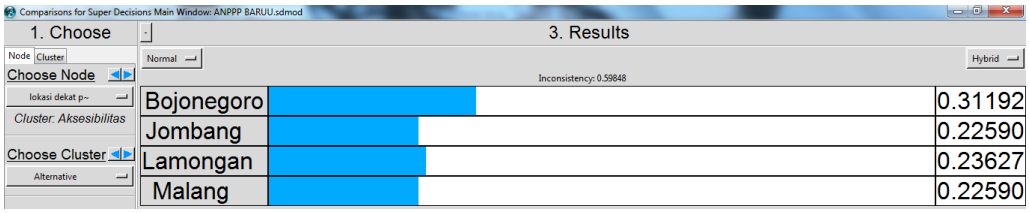

Figure 3. The results of the weighting for each alternative in the sub-criteria for a location close to settlements
(Source: Primary Data, Processed with Super Decisions Softwere 2.10, 2021)

From Figure 4, it can be seen that the sequence of locations adjacent to settlements. For the first alternative order, namely Bojonegoro (0.31192), the second-order is in Lamongan (0.23627), then Jombang and Malang (0.23627), which have the same level value. Therefore, the weighting on the sub-criteria location close to settlements is carried out in order to obtain a priority value for determining the strategic location of a new agent.

Location near highway
It can be seen that the results of the weighting of each alternative in the sub-criteria for location close to highways can be seen in figure 4.

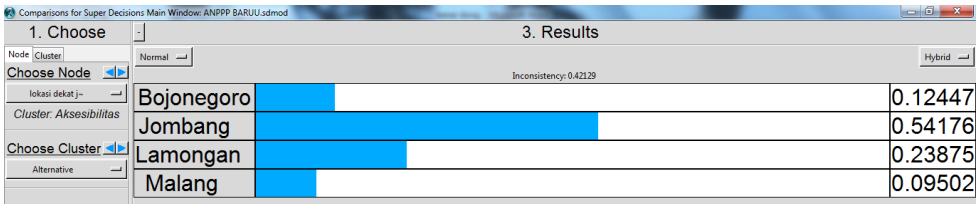

Figure 4. The results of the weighting for each alternative in the sub-criteria for a location close to the highway
(Source: Primary Data, Processed with Super Decisions Softwere 2.10, 2021)

From figure 4, it can be seen that the highest sub-criteria value based on the relationship with alternative locations close to the highway, the selection of the main priority weights is in Jombang (0.54176) the second level is in Lamongan (0.23875) then Bojonegoro (0 ,12447) and the last level is Malang (0,09502). From the results of the priority value, it can be seen that the Jombang alternative has a high value in the sub-criteria for locations adjacent to the highway. Therefore, in determining alternative locations for new agentks, higher priority values must be taken into account to obtain a strategic location.

Availability of labor
It can be seen that the results of the weighting of each alternative in the sub-criteria for the availability of labor can be seen in figure 5.

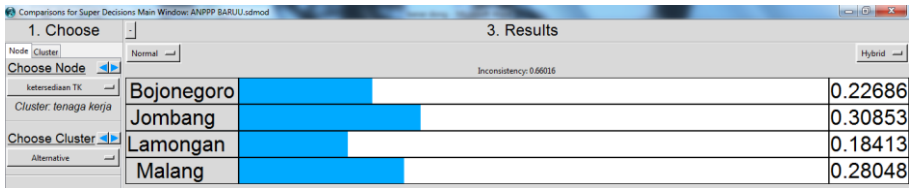

Figure 5. The results of the weighting for each alternative in the sub-criteria for the availability of labor
(Source: Primary Data, Processed with Super Decisions Softwere 2.10, 2021)

From figure 5, it can see that the highest value for the alternative in the sub-criteria of labor availability is the highest value in Jombang (0.30853), the next level is Malang (0.28048), then Bojonegoro (0.22686), and the last is Lamongan (0,18413). From the results of the priority value on the sub-criteria for the availability of higher labor, namely the Jombang alternative. Therefore, to determine alternative locations for new agentks, it can be seen from the increased availability of labor.

Transportation fee
It can be seen that the results of the weighting of each alternative in the sub-criteria of Transportation Costs or the availability of labor in the distribution process can be seen in figure 6.

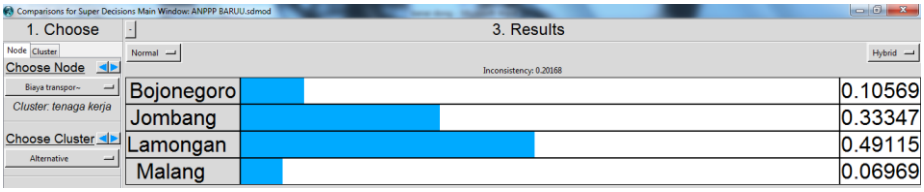

Figure 6. The results of the weighting for each alternative in the transportation cost sub-criteria
(Source: Primary Data, Processed with Super Decisions Softwere 2.10, 2021)

It can see in figure 6, that the sub-criteria for transportation costs or the availability of labor in the distribution process are the highest in the Lamongan alternative (0.49115), the second alternative order is in Jombang (0.33347) then the third alternative is in Bojonegoro (0. 10569), and the lowest was in Malang (0.06969). From the value of priority weighting, it can see that the cost of transportation or the availability of labor in product distribution is the highest in the Lamongan alternative because the Lamongan alternative is close to the production location. Therefore, the alternative of Lamongan was chosen in determining the location of the new agentk because of the transportation costs or the availability of labor in the distribution of many products.

Target marketing
It can see that the results of the weighting of each alternative in the target marketing sub-criteria can be seen in figure 7.

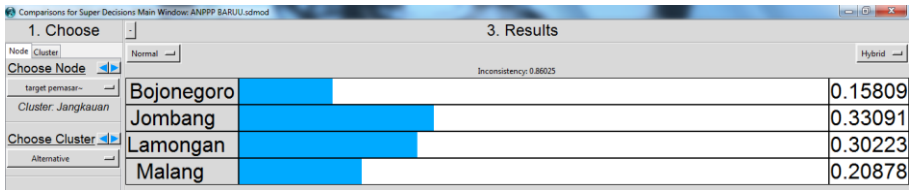

Figure 7. The results of the weighting for each alternative in the sub-criteria of the marketing target
(Source: Primary Data, Processed with Super Decisions Softwere 2.10, 2021)

It can be seen in figure 7 that for a higher marketing target, namely in Jombang (0.33091), the next highest value is in Lamongan (0.30223), the third-highest value is in Malang (0.20878), and the lowest is in Bojonegoro (0,15689). The priority weighting value shows that the Jombang alternative has a high value in the marketing target sub-criteria. Therefore the alternative chosen for determining the location of the new agentk is in the Jombang alternative because of the increased marketing target. In selling products, if the target in marketing is high, the sales target will also increase and increase.

Cooperating in the long term
It can see that the results of the weighting of each alternative in the sub-criteria. doing long-term cooperation can be seen in figure 8.

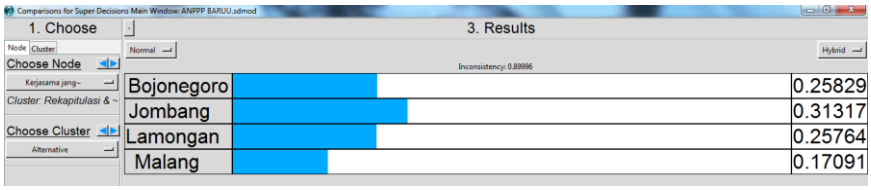

Figure 8. The results of the weighting for each alternative in the sub-criteria for cooperation in the long term
(Source: Primary Data, Processed with Super Decisions Softwere 2.10, 2021)

It can see in figure 8 that for the priority weight for cooperation in the long term, the higher comparison value is in Jombang (0.31317) than Bojonegoro (0.25829) Lamongan (0.25764), and the last is Malang (0.17091).). From the priority weighting value, it can see that the Jombang alternative has a higher value. Therefore the right location in determining the new agent is more appropriate in the Jombang alternative because the Jombang alternative can work together in the long term.

Delivery process accuracy
It can be seen that the results of the weighting of each alternative in the sub-criteria for the accuracy of the delivery process can be seen in figure 9.

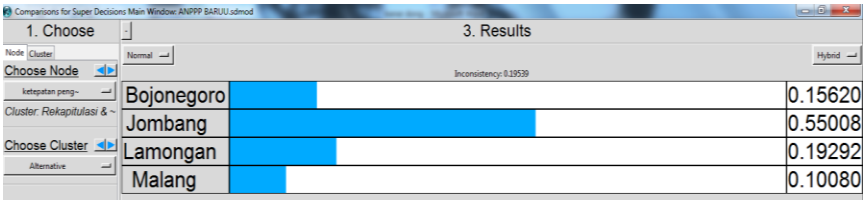

Figure 9. The results of the weighting for each alternative in the sub-criteria for the accuracy of the delivery process
(Source: Primary Data, Processed with Super Decisions Softwere 2.10, 2021)

It can see in figure 9 that the priority weight of the delivery process accuracy is higher in Jombang (0.55008), Lamongan (0.19292), Bojonegoro (0.16520), and the lowest are in Malang (0.10080). It can see in the higher priority value, namely the Jombang alternative. Therefore, the alternative location of the new agentk is based on the comparison of values between the sub-criteria for long-term cooperation on the Jombang alternative because the Jombang location can cooperate in the long term based on the results of the assessment by expert respondents.

Sub-criteria Priority Weight Analysis
Selection of the best location for the agent Lumpia Dewo was carried out using the Analytical Network Process method with the help of Super Decisions Software. Alternative priority weights can see in Figure 10.

Here are the overall synthesized priorities for the alternatives. You synthesized from the network Super Decisions Main Window: ANPPP BARUU.sdmod

Name	Graphic	Ideals	Normals	Raw
Bojonegoro		0.429984	0.171670	0.085835
Jombang		1.000000	0.399246	0.199623
Lamongan		0.600387	0.239702	0.119851
Malang		0.474348	0.189382	0.094691

Figure 10. Results of priority alternatives for super decisions
(Source: Primary Data, Processed with Super Decisions Softwere 2.10, 2021)

The results of data processing using Software Super Decisions show that the best agent location from several selected alternatives is that there are three types of synthesized weights, including ideals, normal, and raw (Reisi et al., 2018)(Jharkharia & Shankar, 2007)(Puspitasari & Ciptomulyono, 2011)(Sembiring et al., 2019). Raw weight is the value derived from the limit weight. The raw weight results from Jombang 0.199623 Lamongan are 0.119851 Malang 0.094691 Bojonegoro 0.065835. The highest value of raw weight is Jombang, Lamongan, Malang, Bojonegoro. Furthermore, the normals weight is the value obtained from dividing the raw weight with the total raw. The result of adding raw weight is 0.5. Then the raw weight of each alternative is divided by 0.5. So that the normal weights obtained from Bojonegoro 0.171670, Jombang 0.399246, Lamongan 0.239702 and Malang 0.189382. It can see that the highest score is in Jombang, Lamongan, Malang, Bojonegoro. The last ideal weight is the value obtained by dividing the normal weight with the largest normal weight. So each normal weight divided by 0.399246 is the largest normal weight. So that the results can be obtained from the ideal weights, namely Bojonegoro 0.429984, Jombang 1, Lamongan 0.60387, Malang 0.474348. Based on these weights, it can see that the highest scores are Jombang, Lamongan, Malang, and Bojonegoro.

5. Conclusion and Implications

Based on the study results, it can be concluded that there are four alternatives for choosing the location of the agent spring rolls Dewo: Lamongan, Jombang, Bojonegoro, and Malang. There are five criteria: Market potential, accessibility, manpower, reach, recapitulation, and trust. The results of selecting new agent locations spring rolls Dewo using the ANP Analytical Network Process method. There are three types of weights synthesized, including ideals, normal, and raw. The highest ideals seed value is Bojonegoro 0.429984, Jombang 1, Lamongan 0.60387, Malang 0.474348. So the business owner can establish a new agent location in the Jombang alternative with the highest ideals value obtained, namely 1.

References

Banaeian, N., Mobli, H., Nielsen, I. E., & Omid, M. (2015). Criteria definition and approaches in green supplier selection–a case study for raw material and packaging of food industry. *Production & Manufacturing Research*, *3*(1), 149–168.

Bayazit, O. (2006). Use of analytic network process in vendor selection decisions. *Benchmarking: An International Journal*.

Febriyanti, A., NA, A. L., & Sharafina, H. (2019). *Penerapan Analytical Network Process Dalam Pemilihan Lokasi Cabang Arosah Fashion*. no.

Hidayat, K., Kasih, R., Muhammad, M., & Muhammad, P. (2019). *Cleaner Production Analysis in the Cassava Tape Industry*. https://doi.org/10.2991/icss-19.2019.146

Jharkharia, S., & Shankar, R. (2007). Selection of logistics service provider: An analytic network process (ANP) approach. *Omega*, *35*(3), 274–289.

Khan, A. U., & Ali, Y. (2020). ANALYTICAL HIERARCHY PROCESS (AHP) AND ANALYTIC NETWORK PROCESS METHODS AND THEIR APPLICATIONS: A TWENTY YEAR REVIEW FROM 2000-2019: AHP & ANP techniques and their applications: Twenty years review from 2000 to 2019. *International Journal of the Analytic Hierarchy Process*, *12*(3).

Kuka, M. G. K. (2018). Product Development and Management Strategies. *Product Lifecycle Management: Terminology and Applications*, 11.

Mittelstaedt, J. D., Ward, W. A., & Nowlin, E. (2006). Location, industrial concentration and the propensity of small US firms to export: Entrepreneurship in the international marketplace. *International Marketing Review*.

Puspitasari, A., & Ciptomulyono, U. (2011). Aplikasi Model Zero-One Goal Programming, DEMATEL, & ANP Untuk Optimasi Pemilihan Strategi Pemasaran. *Surabaya: Institut Teknologi Sepuluh Nopember*.

Reisi, M., Afzali, A., & Aye, L. (2018). Applications of analytical hierarchy process (AHP) and analytical network process (ANP) for industrial site selections in Isfahan, Iran. *Environmental Earth Sciences*, *77*(14), 1–13.

Saaty, T. L. (2004). Decision making—the analytic hierarchy and network processes (AHP/ANP). *Journal of Systems Science and Systems Engineering*, *13*(1), 1–35.

Sembiring, N., Matondang, N., & Dalimunthe, A. R. (2019). Supplier selection in rubber industry using analytic network process (ANP) and technique for order preference methods by similarity to ideal solution. *IOP Conference Series: Materials Science and Engineering*, *508*(1), 12091.

Sinaga, B. (2018). Penentuan Media Promosi Dengan Metode Analytic Network Process (ANP)(Studi Kasus: STMIK PELITA NUSANTARA MEDAN). *Jurnal Mantik Penusa*, *2*(1).

Tang, S. Y., Lee, J. S., Loh, S. P., & Tham, H. J. (2017). Application of Artificial Neural Network to Predict Colour Change, Shrinkage and Texture of Osmotically Dehydrated Pumpkin. *IOP Conf Series: Mat Sci Eng*, *206*, 12036.