



Decision Support System for Determining the Best Wood For the Production Cabinet in PT. Tanjung Timberindo Using Bayes Method

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ABSTRACT

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Wood in the furniture company is a material that is needed in the manufacture of a product, for example in the manufacture of cabinets or other furniture products. Furniture companies at this time often have problems in determining wood for good quality and lack of knowledge in good wood specifications to be used as materials for making wood crafts, furniture companies only think of orders and do not consider the results of craftsmanship produced from raw materials is wood where to determine a production in order to get quality that is of a quality wood drought must be considered. PT. Tanjung Timberindo is a company engaged in the furniture industry, the determination of wood in this company is not easy having to go through several considerations that are thought out before making the right decision based on the required standard categories, comprehensive and accurate information is needed, so with the ability to analyze Sharp is expected to give birth to decisions that are in accordance with the problem namely by using the physical criteria of wood, wood age, and substances contained in wood. In determining the best wood quality for cabinet production, companies often face problems where the process of selection and processing and mathematical calculations are certain, that is, not as expected as having straight, smooth and strong wood fiber and has a moisture content of not more than 15% before processing .

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1. Introduction

Wood on furniture company is a material that is very needed in the manufacture of a product, for example in the manufacture of cabinets or other furniture products. Companies furniture at this time often experience problems in determining the wood for a good quality and a lack of knowledge within the specifications of a good wood to be used as materials for wooden crafts, company furniture just think of the order and did not consider the results kerajinan produced from the raw material is wood in which to determine a production order to obtain quality berkualitas timber drought must be considered. PT. Tanjung Timberindo is a company engaged in the furniture industry, determination of wood on companies is not easy to have to go through some of the considerations that thought first before taking the right decision based on the category of the standard required, the necessary information that is thorough and accurate, so that the ability of a sharp analysis is expected to give birth to a decision in accordance with the problems of the using physical criteria wood, aged wood, and the substance contained in the timber. In determining the quality of the best wood for the production of cabinets companies often face the problem that the process of selecting and processing as well as mathematical calculations that certainly is not as expected as having wood fibers straight, smooth and strong and has a moisture content of not more than 15% before it is processed , Bayesian methods is a fundamental statistical approach to pattern recognition (Pattern Recognition), this approach is based quantification of trade-of between ruling (Nur Aini





Hiutagalung 2018). In determining the best wood use Bayesian methods are used by the company statutes and standards-based timber harvesting feasible. Having obtained the results of calculations can be taken statutes perkategori worthy or not of wood used to limit, if the results of data collection each category multiplied premises result is greater or equal to the threshold value of the provision is feasible and nice wood made furniture craft materials. In determining the best wood use Bayesian methods are used by the company statutes and standards-based timber harvesting feasible. Having obtained the results of calculations can be taken statutes perkategori worthy or not of wood used to limit, if the results of data collection each category multiplied premises result is greater or equal to the threshold value of the provision is feasible and nice wood made furniture craft materials. In determining the best wood use Bayesian methods are used by the company statutes and standards-based timber harvesting feasible. Having obtained the results of calculations can be taken statutes perkategori worthy or not of wood used to limit, if the results of data collection each category multiplied premises result is greater or equal to the threshold value of the provision is feasible and nice wood made furniture craft materials.

2. Theory

2.1 Decision Support Systems (DSS)

Decision Support System (DSS), is generally defined as a liberal system that is able to provide both the ability and the ability of problem solving capability of communicating to semi-structured problems. Specifically, CMS is defined as a system that supports the work of a manager or group of managers in a semi-structured problem solving by providing information or specific proposals leading to the decision (Pure Marbun and Bosker Sinaga, 2018: 9).

The components of the DSS is as follows (Pure Marbun, S.Si., MM., M.Kom and Bosker Sinaga, Kom ..., M.Kom, 2018: 18):

1. Data Management

Including database, which contains data that is relevant to a variety of situations and governed by software called a Database Management System (DBMS).

2. Model Management

Involving finansial models, statistics, management science, or various other qualitative models, so as to provide for a system of analytical capabilities, and management software needed.

3. Communication

user can communicate and give orders to the DSS through this subsystem. It means providing the interface.

4. Knowledge Management

Optimal subsystem can support other subsystems or act, or act as a stand-alone component.

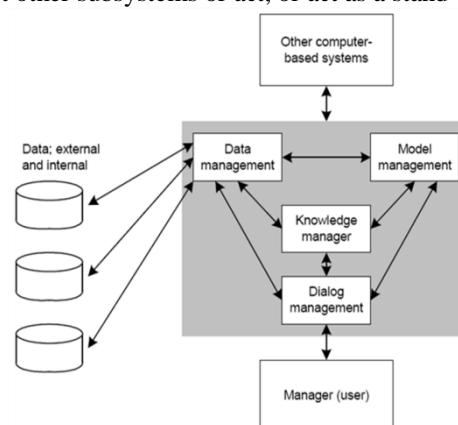


Figure 1. Conceptual Model SPK

Source: Pure Marbun, S.Si., MM., M. Kom, Bosker Sinaga, Kom ..., M.Kom, 2018

2.2 Bayesian methods

(Nila Susanti, Sri Winiarti, Bachelor of Engineering Informatics Journal, 2013: 329), Bayes criteria that will be used is the expected value (expected value) as the basis for the calculation useful for decision





making. Very broad term expected value of its use, in theory the expected value decision making is one of the basic criteria for decision-making. The expected value is the sum of the probability values that are expected to occur respective probabilities of an event that is not certain. In this case, the expected value is considered as the average value of each category.

As for the steps to be taken are as follows:

1. Calculate the expected value of the pay-off for each of the possible actions. To calculate the expected value (expected value) by:

- a. Calculating the weight of each category, using the formula:

$$bk \sum_{i=1}^n oi \dots\dots\dots (1)$$

Where :

i = Question

n = Number of questions

o = Total option of questions i

bk = The weight of each category

- b. Having obtained the weight of each of these criteria, then used for calculating the total weight, where the weight of the total derived from the sum of weights of criteria. Formulated as follows:

$$BT \sum_{k=1}^l Bk \dots\dots\dots (2)$$

- c. Having in mind the total weight (BT), then the probability of each category is obtained from the weight of each category divided by the total weight. So the formula is used as follows:

$$PK = \frac{BK}{BT} \dots\dots\dots (3)$$

Bk = The weight of each category

BT = Total weight

P_k = Probability of each criteria

- d. A timber is said to meet the quality standards according to predefined categories if the score is greater (>) than the threshold value of each category (Ak). The threshold value of each criterion is obtained by using the following formula:

$$A_k = \frac{B_k}{2} \times P_k \dots\dots\dots(4)$$

Where :

A_k = Value threshold category

B_k = Weight of each category

P_k = Probability of each category

- e. Determining the overall threshold value using the formula: AT = A1 + A2 + A3 + ... An
..... (5)

Where: AT = Threshold Total

(1,2,3 ... n) adalh index for each category.

4. P (E): Probability of evidence E.

3. Results and Conclusions

3.1 Data analysis

Analysis of the data used in this research is to analyze the data and data alternative criteria used in this study and menuesuaikan in accordance with the needs required in the company. Some of the criteria used as a reference in determining the best wood for the production of cabinets in PT. Tanjung Timberindo are as follows:

- a. Physical Properties of Wood [C1]
- b. Wood class [C2]
- c. Age Wood [C3]
- d. Substances contained in wood [C4]

Having found the data criteria to be used then determined as an alternative form of the criteria for the production of cabinets, alternative data can be viewed below:

- a. Mahogany





b. Meranti wood

3.2 Analysis Bayes Method

Table 1
Decision matrix

Alternative	Criteria			
	Physical Properties of Wood [C1]	Wood Grades [C2]	age Wood [C3]	Substances That Conceived Wood [C4]
Mahogany [A1]	5	5	2	3
Meranti [A2]	3	4	5	1

After the results of the sorting is complete, then determine the weight of each criterion (physical properties of wood, wood classes, Age Wood, substances contained) based lots of wood that had been used then used the criteria of importance. The data below is data on the level of interest that has been created by PT. Tanjung Timberindo.

Table 2
Importance

Criteria	grades kindergarten
Physical Properties of Wood	1/10
Wood Grades	1 / 7.5
age Wood	1/5
Substance The Conception	1 / 12.5
amount	0.51

Once the level of interest is known, then determine the weight of each criterion is to value the importance of each divided by the number of criteria and then multiplied by one (the number of provisions in the Bayes method)

Table 3
weights Criteria

Criteria	grades kindergarten	Weight
Physical Properties of Wood	1/10	0:19
Wood Grades	1 / 7.5	0:26
age Wood	1/5	0:39
Substance The Conception	1 / 12.5	0:15
amount	0.51	0.99

To get the value of alternative and ranking table above, can be calculated with the following calculation:

$$\text{Value (Mahani)} = (5 * 0.19) + (5 * 0.26) + (2 * 0.39) + (3 * 0.15) = 0.66$$

$$\text{Value (Meranti)} = (3 * 0.19) + (4 * 0.26) + (5 * 0.39) + (1 * 0.15) = 0:51$$

Furthermore, each alternative value divided by the sum of the value of alternative keseluruhan order to get a percentage of any alternative that will serve as the probability of production restocking the cupboard.

$$\text{Total alternative} = 0.66 + 0.51 = 1.17$$

Determining the percentage of each alternative:

$$\text{Alternative \{Mahogany\}} = \{\text{mahogany alternative value}\} / \text{Total Alternative} * 100 = 0, 66 / 1.17 * 100$$





$$= 56,41\%$$

$$\text{Alternative \{Meranti\}} = \{ \text{meranti alternative value} \} / \text{Total Alternative} * 100$$

$$= 0.51 / 1.17 * 100$$

$$= 43.58\%$$

It can be concluded from the results of calculations that have been done with Bayes method for the determination of the best wood for the production of cabinets can be obtained the results of two alternative timber used the best wood is Mahogany with a percentage of 56.41% per cent of the value that can be used for a seat.

Table 4
Decision

Alternative	Percentage	Ranked
Mahogany	56.41%	1
Meranti wood	43.58%	2

4. Conclusion

Based on research conducted by researchers, we can conclude several things as follows:

- With the decision support system for elections to the hospital labotaorium grandmed Lubukpakam will assist management in the selection of the plant in different heads faithful.
- With the decision support system proves that the method (BAYES) successfully implemented into the system and has been shown at the time of the study testing.
- The calculation of the value of different weights and resulted in a different decision.

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