

Decision Support System for Choose Provider Partners Goods / Services



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Abstract: Every company definitely needs supporting items for its daily activities. Companies need goods to support office activities and other activities such as paper, computers, printers and others so that choosing a vendor that provides the needs of these goods at low prices, fast delivery time is very important. During this time the vendor selection process is done manually so that the decisions made do not provide maximum profit for the company. This research aims to build a DSS model to help companies choose vendors to provide goods / services. AHP method is used to build a DSS model that will produce several alternative vendor choices by considering predetermined criteria. The result of this research is the DSS model for selecting vendors that supply goods and services

Keywords: DSS, Model, Provider.

I. INTRODUCTION

Decision from top management that are long-term strategic will have an impact on all business activities of the company. Strategic decisions will be translated into operational policies that are directly related to the daily activity of the company. If strategic decisions are not made properly, negative effects will hinder the company's overall business processes. Therefore strategic decisions must be made in the right way so that the results of the decision will positive influence for the company.

One important part that affects the daily activities of the company is the purchase of goods / services to support the company's business processes. This research will explain the comprehensive purchase nature that has been found based on empirical data [1] and based on observations from several discussion group forums

One important factor that will affect almost all aspects of the company is the purchase of supporting goods. Supporting items such as paper, stationery, computers, printers and others needed by all company divisions.

Therefore the selection of vendors that provide supporting goods becomes very important so that the daily business process of the company runs as scheduled.

Based on observations in several companies the process of selecting vendor supply of goods / services is done manually so that results in disappointing decisions. an example of the impact of a mistake in choosing a vendor is that the goods provided do not match those ordered, the goods are often late to send, the price of the goods often changes from the initial agreement.

Based on these findings, this research is carried out. The purpose of this research is to build a decision support system model to select vendors of providers of supporting goods / services. The method uses analytical hierarchical processing (AHP). This model can help a company to choose a vendor of supporting goods / services by first determining the criteria or requirements that must be owned by the vendor. The model has been tested and produced several suggestions and feedback

II. LITERATURE STUDY

A. Decision Support System

Decision support systems are a part of information technology, especially information systems that are used for decision making. Another definition explains the function based on changing data into information where the information will be used in taking from problems to problems, especially semi-structured problems. Another definition of DSS is described as a system that has the ability to analyze data and produce decision models can be used in unstructured conditions [2]. DSS becomes a system that can make decisions that are impossible to do manually. Decision Support System (DSS) is used to help decision makers in overcoming existing problems. DSS is not intended to automate decision making. DSS is able to provide interactive tools for decision makers to carry out various data analyzes, using available models [3].

B. Analytical Hierarchical Processing

Analytical Hierarchical Processing was developed by Thomas of Wharton with his ability to share decisions by providing assessment criteria and alternative solutions [4].

Analytical Hierarchical Processing is a method designed to solve problems that are not routine and not structured. Hierarchical Processing analytical also allows dividing the complexity of problems into simpler components. Small components are then arranged in a hierarchical order. After being arranged in a hierarchical arrangement then each component will be compared with one another. Comparison between components will illustrate the scale of priorities between one components to another. Giving weights to determine priorities based on subjectivity and experience. [5]

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The interests and priorities of Analytical Hierarchical Processing depend on subjectivity and the experience of decision makers. Significant differences will occur between one decision maker with another decision maker due to differences in subjectivity and the experience of both decision making. Besides subjectivity and experience there are other things in AHP that are used in decision making: the logic and judgment of individuals. Logic is interpreted as logical thinking in decision making and its relation to judgment. [6] The AHP stages are explained as follows: [7]

1. Arrange problems in a multilevel hierarchy as preparation for the next stage. This initial stage is the stage for designing the goals of the system. After the objectives are determined then design the criteria that will be used in determining priorities. Each criterion can have one or several sub-criteria. 2) Determine the priority of each criterion in pairs means that one criterion is compared with other criteria by giving greater weight to more important criteria. Comparison criteria given score or weight is depicted by matrix [8]. Determination of the score or weight is written with a number between 1 and 9 as described in table 1

Table 1

Scale of priority	Explanation
1	Equal importance
2	Weak
3	Moderate importance
4	Moderate plus
5	Strong importance
6	Strong Plus
7	Very Strong
8	Very, very strong
9	Extreme strong

III. METHODOLOGY OF RESEARCH

Based on observations of several companies that use vendor services and supporting services, the following requirements are obtained:

General Requirement (GR)

Table 2

		3	2	1
GR1	Application letter for registration as a company's Partner, signed by the Company Management	good	Fair	Poor
GR2	Deed of Establishment of the company and its amendments	good	Fair	Poor
GR3	Trading Business License	Good	Fair	poor
GR4	NPWP (Taxpayer Identification Number) and a copy of the determination letter as PKP (Taxable Entrepreneur).	Good	Fair	poor
GR5	Certificate of Domicile (SKD) that is still valid	Good	Fair	poor
GR6	proof of last tax payment (Corporate Income Tax) and a copy of Tax Payment (CNS)	Good	Fair	poor

GR7	A valid Company Registration Certificate (TDP)	Good	Fair	poor
GR8	Financial Statements of the company the last 2 years	Good	Fair	poor
GR9	Certificate from standardization institution according to specification	Good	Fair	poor
GR10	Statement of Not having a Conflict of Interest	Good	Fair	poor
GR11	Declaration of Acceptance of Company Rules and Conditions that have been filled out and signed	Good	fair	poor
GR12	Declaration of Truth of Data and Information	Good	fair	poor

Specific Requirement (SR)

Table 3

SR		3	2	1
SR1	Company management.	Good	fair	poor
SR2	Available and used production capacities (specifically for manufacturers)	Good	fair	poor
SR3	Number of employees and specifications of expertise.	good	Fair	Poor
SR4	Technology and Innovation.	good	Fair	Poor
SR5	Delivery Service/ Quality Services	good	Fair	Poor
SR6	Quality Control & Standard Operating Procedure (SOP)	good	Fair	Poor
SR7	Certification in accordance with business line specifications other than the general standard certification set	good	Fair	Poor
SR8	List of work / project experiences in the past 3 (three) years.	good	Fair	Poor
SR9	. Photos depicting the situation: office, workshop, warehouse, business activities and others	good	Fair	Poor

Table 4 explains the weights for each criterion with 3 ratings: good fair and poor. Giving weights can be adjusted according to needs. If a more detailed assessment of each criterion, the interval can be added between 1-5.

Criteria and alternatives are explained in the table below:

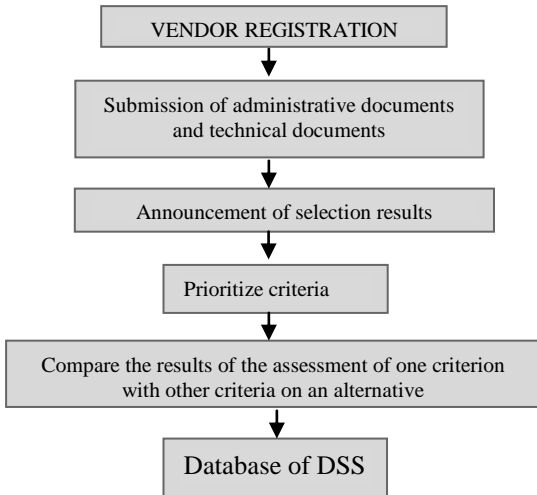
Table 4

	Criteria 1	...	Criteria n
Criteria 1			
...			
Criteria n			
Alternative	f1(.)	F2(.)	... fm(.)
a1	f1(a1)		...

a2	f1(a2)		...	
...
an			...	fm(an)

IV. RESEARCH DIAGRAM

Prospective suppliers who are interested in partnering with a company must go through the stages as illustrated in the diagram below



The initial stage begins with vendor registration through online media. Online registration must include administrative documents and technical documents as required. The company will verify the documents sent by the vendor in the registration process. The next step is the company determines the priority scale of general criteria and specific criteria and provides a comparison score between the criteria. The results of the comparison scores and vendor data are stored in the DSS database. The next step is to provide an assessment of one criterion with other criteria for an alternative. For example vendor candidate 1 will be valued based on General References 1 to general requirement 12. Likewise for vendor candidate 2, 3 and so on as illustrated in figures 1, 2 and 3

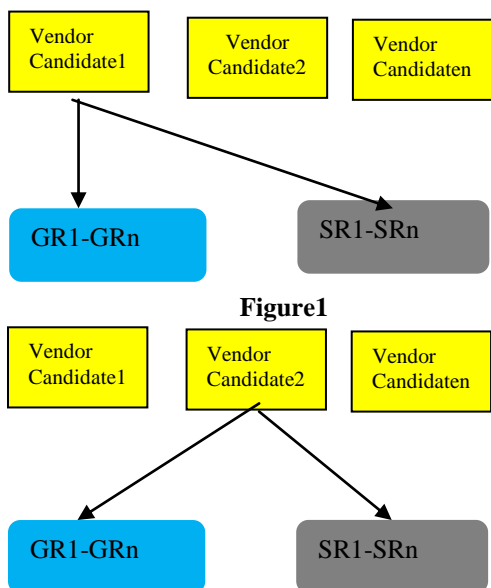


Figure 2

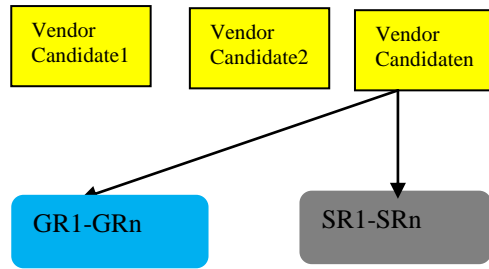


Figure 3

V. DISCUSSION

Based on the findings from the pre-assessment process, during the appraisal and after the assessment of the feasibility of prospective vendors, a model for making decisions on the determination of suppliers of goods and services is provided as illustrated in the figure 5 below.

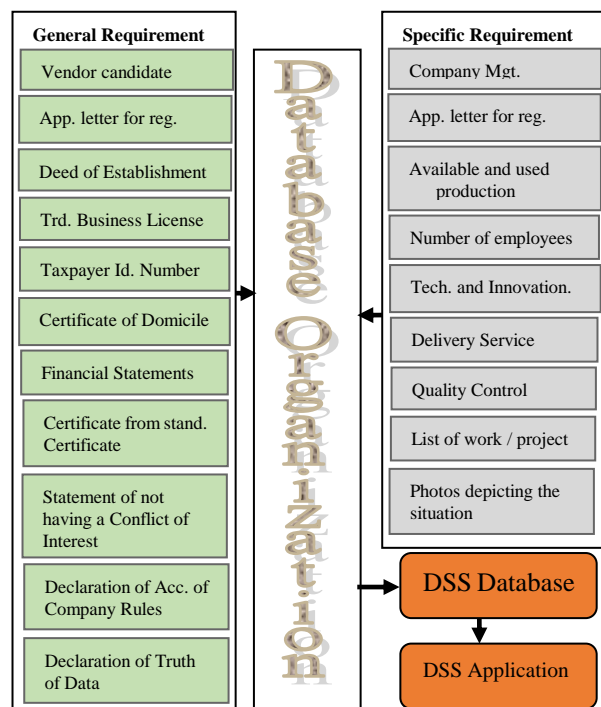


Figure 5

VI. MODEL EVALUATION

1	Part of Model	Advice
	Model based on general requirement DSS Model with AHP and DSS	There are some findings in general requirement that are not present in the model for other company. I think needs to extend the general requirement for another items not only 12 items
2	Model based on Specific requirement DSS Model with AHP and DSS	There are some findings in specific requirement that are not present in the model for other company. I think needs to extend the general requirement for another items not only 9 items

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3	Whole model DSS for vendor candidate	DSS model for candidate vendor that provide good or service need to be Improve for the part of DSS application. I think DSS application should be more explained in this model with explain about the front and or backend.
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VII. CONCLUSION

This model was created to help companies establish partners who provide supporting goods / services so that they will be very useful because almost all companies need supporting goods / services. Determination of company partners who provide supporting service goods will greatly affect the company's business activities because the needs of supporting goods / services are used at all times by each section in all types of companies

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AUTHORS PROFILE



Inayatulloh is a doctoral student at Bina Nusantara University who is conducting research on knowledge management systems. Some previous studies related to knowledge management system and small and medium enterprise