H

C B E BE
H C C A

Long-term supplier selection problem: A case study

Ercan Senyigit ^{a *} D E E
Ismet Soylemez D E A G
Ugur Atici ^c G D A C

Suggested Citation:

E A
Issues Proceedings on Humanities and Social Sciences.

New Trends and
A

C D Ç B G
A

Abstract

G

A

F

A

* ADD E F C E DE CE Ercan Senyigit, D

E E

E-mail address _____

1. Introduction

C

H D B

C H D B C B D

2. Literature review

E AH A H E HEE G B

A B

B C

F AH

H

A E C

G H

3. Problem statements

Nomenclature

I	Suppliers
J	Criteria
X _{ij}	j.criteria value of the supplier i
W _{ij}	j.criteria weight of weight of the supplier i
Y _{ij}	Transformed value of criteria I of supplier j
G _i	Goodness score of supplier i

$$Max S_i = \sum_{j=1}^J W_{ij} * Y_{ij} \quad (1)$$

s.t.

$$w_{ij} - w_{i(j+1)} \geq 0 \quad j = 1, 2, \dots, (J-1) \quad (2)$$

$$\sum_{j=1}^J w_{ij} = 1 \quad (3)$$

$$w_{ij} \geq 0 \quad j = 1, 2, \dots, 5 \quad (4)$$

$$Y_{ij} = \frac{(X_{ij} - \min_{i=1,2,\dots,I\{X_{ij}\}})}{(\max_{i=1,2,\dots,I\{X_{ij}\}} - \min_{i=1,2,\dots,I\{X_{ij}\}})} \quad (5)$$

E E

E

G

E

F

D

4. The case study

Figure 1. Picture of the pulley.

A

-
-
- D DE
- D D

A

F

A

Table 1. Supplier Selection Criteria of the Company and Data Belonging to the Criteria.

Suppliers	Q (%)	P (TL)	DE (%)	DI (Km)
-----------	-------	--------	--------	---------

Table 2. Combinations Belonging to Selection Criteria.

No	Combinations		No	Combinations	
	DE	D	DE	D	
	D	DE	DE	D	
DE		D	DE	D	
DE	D		DE	D	
D		DE	DE	D	
D	DE		DE	D	
	DE	D	D		DE
	D	DE	D		DE
DE		D	D		DE
DE	D		D		DE
D		DE	D	DE	
D	DE		D	DE	

Table 3. Normalized Data.

Suppliers	Q	P	DE	DI
-----------	---	---	----	----

5. Modeling and solution

$$\text{Max } G_i = w_{i1}Q + w_{i2}P + w_{i3}DE + w_{i4}DI$$

St.

$$w_{i1} - w_{i2} \geq 0$$

$$w_{i2} - w_{i3} \geq 0$$

$$w_{i3} - w_{i4} \geq 0$$

$$w_{i1} + w_{i2} + w_{i3} + w_{i4} = 1$$

$$w_{ij} \geq 0$$

F

F

6. Modeling and solution

A

H

A

A

Table 4. Results								
Ranking No	Ranking of criteria		S1	S2	S3	S4	S5	Ranking of suppliers
		DE	D	1.00				
		D	DE	1.00				
		DE	D	1.00				
		DE	D	1.00				
		D	DE	1.00				
		D	DE	1.00				
		DE	D				1.00	
		D	DE				1.00	
		DE	D				1.00	
		DE	D				1.00	
		D	DE				1.00	
		D	DE				1.00	
	DE	D				1.00		
	DE		D			1.00		
	DE		D			1.00		
	DE	D				1.00		
	DE	D				1.00		
	D		DE			1.00		
	D		DE			1.00		
	D		DE			1.00		
	D		DE			1.00		
	D	DE				1.00		
	D	DE				1.00		
	A					0.92		

References

B
Operations Research, 32

C
Computers &

C
Expert Systems with Applications, 40

C
International Journal of Production Economics, 166

C
H
Computer and Industrial Engineering, 55,