

2 questions

Business



Placement of Departments Question one Plant Capa

Next Years Demand

Alternative

Low

High

Minimum \$

Maximum \$

Do nothing

50

60

50

60

Expand

20

80

20

80

Subcontract

40

70

40

70

i. Using the Maximin rule Highest minimum = \$ 50; therefore we choose to do nothing

ii. Using the Maximax rule Highest maximum = \$ 80; therefore we choose to expand

iii. Laplace method

conditions

Probability

Do nothing

Expand

Subcontract

High

1/3

60

80

70

Low

1/3

50

20

40

EMV

36.67

33.33

13.38

Workings

$$\text{EMV (Do nothing)} = \frac{1}{3}(60) + \frac{1}{3}(50) = 36.67$$

Others are computed in the same way.

Decision

We choose to do nothing since this decision maximises the expected monetary value.

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iv. Minimax Regret rule

Alternative

Low

High

Maximum regret

Do nothing

50

60

60

Expand

20

80

80

Subcontract

40

70

70

Therefore, we choose the minimum of the maximum regret, which in this case is \$ 60 (Do nothing option)

Recommendation

After using the four different methods to analyze the situation; expect one method (maxmax), all the others have shown that doing nothing is the best option in maximising the value for money for the company next year. In this regard, I will advise the company to adopt this option, and ignore the one opted by maxmax method. Indeed, I will encourage the management to give maximaxi a wide berth if the company is not in a capacity to withstand

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extreme losses. This is specifically because the maxmax is only attractive to risk takers who are prepared to face huge losses in the event that such losses occur. Furthermore, if this business is new or small, then this method is very unsuitable. In choosing maxmin criterion, the management will be looking at the worst possible situation in all the options and then adopting the option that provides the least bad results; that is, they adopt the option that optimizes the least profits. As already discussed, this criterion will not be attractive to this particular company if its owners are risk averse decision makers because the method is based on excessive watchfulness. However, while adopting Laplace method, the management should be sure that they are not conversant of chances of different conditions and have no reason to decide otherwise.

Question 2

From the calculations, the most central location is B; therefore, the most frequented department (4) should be placed there. The department that makes more trips to department 4 is department 2, therefore should be placed at the locations closest, for instance A, which is 40 yards from A. Second priority should be offered to department 1, which makes 80 trips to department 4. This department should be placed at location C, which is 40 yards from location B. Automatically, the last department, which is 3, will be located at location D, which is the most distant location at 50 yards from department D's location (Stevenson, 2008).

Table showing the placement of the different departments, number of trips made to the different departments and the cost per trip from the different allocations of the department.

Department 1

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Department 2

Department 3

Department 4

Location C

Location A

Location D

Location B

(Trips to department 4) 80

(Trips to department 4) 90

(Trips to department 4) 55

-

(Cost per trip) \$ 40

(Cost per trip) \$ 40

(Cost per trip) \$ 50

-

b).

Following the revised trips schedule, minimizing travel costs will be best when the departments are placed as described below. The highest number of trips are made to department 4, therefore, it should be placed at the most central location. Therefore, taking the distances indicated in part a, department 4 should be placed at location B, which is 40 yards from location A; 40 yards from location C; and 50 yards from location D. However, priority should be given to department 3, which does 60 trips to department 4. Department 3 should be placed at either location C, then department 2, which makes 50 trips to department 4. Department 2 should be placed at location A, as the distance between the two and location B. Lastly, is

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department 1, which makes 40 trips to department 4. Department 1, should be placed at location D (Stevenson, 2008).

Reference

Stevenson, W. (2008). Operations Management. Richmond State: VA McGraw-Hill/ Irwin Publishers.