Operations Research Project on Transportation Problem

<u>Rakesh Grain Store</u>

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I am very thankful to the owner of Rakesh Grain Store Mr.Rakesh for giving his precious time & providing us the data of his company.

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Abstract

North-West Corner Rule & Modified Distribution (MODI) method are the techniques used to analyse data on the Transportation Problem approach to minimize transportation cost for Rakesh Grain Store. The procedures used for minimizing the cost are the techniques learnt in operations research for transportation problems. We found that the least cost for transportation can be Rs.75,550.

Introduction

- This mini project is a part of internal assessment of Operations Research of our course.
- In this project we are using Transportation Problem to minimize transportation cost / cost.
- We chose transportation problem as our topic as it suited best for the firm.
- The objective of the project is to increase profit by minimizing the transportation cost. (Minimization)
- For this project data was collected directly by the firm's owner as he is solely responsible for making all the decisions for the firm.
- The data is collected for the period of year 2014-15.

Source of Data

The data is collected considering the petrol costs and the transportation details provided to us on telephonic conversation.

Methodology for data analysis:

For this project data is analysed manually. All the techniques and calculations are done manually with the reference of what was taught to us in the lectures.

Operations Research techniques used:

- North West Corner Rule
- Modified Distribution Method [MODI method]

Data Analysis:

Table no.1
Cost of transportation from and to various places.

	Arera Colony	Tatya Tope Nagar	Chowk Bazaar	Demand
Bhojpur	60	50	60	350
Sehore	17	90	105	450
Bhauri	21	100	105	500
Ratibad	30	70	80	200
Supply	650	450	400	1500/1500

By applying North West Corner Rule we get the following allocation:

Table no.2
Allocations obtained from North West corner rule

	Arera Colony	Tatya Tope Nagar	Chowk Bazaar	Demand
Bhojpur	60 **(350)**	50	60	350
Sehore	17 **(300)**	90 **(150)**	105	450
Bhauri	21	100 **(300)**	105 **(200)**	500
Ratibad	30	70	80 **(200)**	200
Supply	650	450	400	1500/1500

Cost of transportation in accordance with allocations obtained from North West corner rule:

60 * 350= 21000

17 * 300= 5100

90 * 150= 13500

100 * 300= 30000

105 * 200= 21000

80 * 200= 16000

Total= 106600

By applying MODI Method we get the following allocation:-

Table no.3
Allocations obtained from MODI method.

	Arera Colony	Tatya Tope Nagar	Chowk Bazaar	Demand
Bhojpur	60	50 **(150)**	60 **(200)**	350
Sehore	17 **(150)**	90 **(300)**	105	450
Bhauri	21 **(500)**	100	105	500
Ratibad	30	70	80 **(200)**	200
Supply	650	450	400	1500/1500

Cost of transportation in accordance with allocations obtained from MODI method:

50 * 150= 7500

60 * 200= 12000

17 * 150= 2550

90 * 300= 27000

21 * 500= 10500

80 * 200= 16000

Total= 75550

Conclusion:

- Our data analysis shows that the transportation cost is minimum hence this is optimum solution.
- Transportation Problem technique is one of the best techniques to reduce the transportation cost and increase profit.
- Operation research techniques are very efficient and effective for making optimum decisions.

Reference:

- Operation research books.
- Data sheet provided by the Rakesh Grain Store.

Annexure

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INFORMATION of TRANSPORTATION COST

FOR

Rakesh Grain Store

Transportation from
↓

Arera Colony
to → Bhojpur = ₹ 60
to → Sehore = ₹ 17
to → Bhawri = ₹ 21
to → Ratibad = ₹ 30

Tatya Tope Nagar
to → Bhojpur = ₹ 50
to → Sehore = ₹ 90
to → Bhawri = ₹ 100
to → Ratibad = ₹ 70

Chowk Bazaar
to → Bhojpur = ₹ 60
to → Sehore = ₹ 105
to → Bhawri = ₹ 105
to → Ratibad = ₹ 80

Average Demand and Supply from Stores

Supply
↓

Arera Colony	=	650 Kg
Tatya Tope Nagar	=	450 Kg
Chowk Bazaar	=	400 Kg

Demand
↓

Bhojpur	=	350 Kg
Sehore	=	450 Kg
Bhauri	=	500 Kg
Ratibad	=	200 Kg