

Application of transportation problems in LuLu Hypermarkets

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Abstract— The purpose of this research is to see if the MODI method can save the cost of transportation. Thus it is vital to organize the distribution so that the cost is as low as possible. We have conducted a research on proper distribution of the food grain supplies using the above mentioned method so that it reaches the destination with minimum cost.

Keywords—*Transportation problem, minimizing cost, Lulu Hypermarket,*

I. INTRODUCTION

As we have selected Lulu, it is also one of the UAE's fastest growing brands at present. What began as a small supermarket in Abu Dhabi in 1995 is now one of the largest retail chains in the Middle East. With the parent company EMKE Group headquartered in Abu Dhabi, LuLu Hypermarket has over 120 outlets worldwide, of which 10 are in the Kuwait.

It further continued innovating new offerings for its market base, LuLu Group has launched its own-labeled items for transporting it to different destinations as to generate more revenue. Adhering to its tagline "where the world comes to shop" Lulu focuses on delivering quality products to its customers all around the globe at the best prices, LuLu has always been customer-focused and the price of the products is decided after analyzing the demand of the consumers.

II. OUR RESEARCH

First, for the ease of operations Lulu group has divided Kuwait into a few parts where the warehouses are located who take care of the logistics operations in the State. It has many warehouses like Al-Ammary Gen.Trading & Cont.Co., Hamza Mukamis Est, Communique Kuwait, and Fathima imports and exports. The supply of goods are managed with the help of warehouse management system. Ordering from store to warehouse is completely automated and they practice computerized re-ordering of products, depending on sales data from point of sale, seasonal changes, actual inventory levels, receipts and acceptable safety stock levels. In order to do our research we have ordered the goods for a month and calculated its transportation cost.

The transportation of goods from the warehouse situated in Fatima imports and exports is made in different lucrative destinations around Kuwait.

III. FINDINGS

Since we have selected various pulses, we have placed order for in different stores of Lulu located in Al Rai, Al Dajeej and Al Fahaheel.

The total quantity of goods we require for rice for example, is 312 tons. As each store will not have the same demand for rice, the hypothetical demand of Al Rai we have taken is 82 tons, Al Dajeej as 89 tons as both of these stores are located nearby if we look at the distance so we have assumed that the demand will be relatively same. Al Fahaheel is located in the outskirts of the city.

The transportation cost will be higher because there will be longer distance to cover. The same concept is applied to other goods as well as mentioned in the table.

There are various warehouses from which the goods will be transported to different Lulu stores located in the aforementioned locations.

Individual stores and their demand

Pulses	Quantity (tons)	Al Rai	Al Dajeej	Al Fahaheel
Rice	312	82	89	141
Brown rice	210	62	66	82
Basmati rice	311	91	100	120
Brown Lentils	24	3	6	15
Kidney Beans	50	14	15	21
Green peas	49	15	16	18

Total 956

IV. SOLUTIONS

Using vogel's approximation method

Minimum Transportation Cost Calculator | VAM Calculator

Number of Rows: Number of Columns:

Create
Reset

	D1	D2	D3	Supply
S1	<input type="text" value="12"/>	<input type="text" value="14"/>	<input type="text" value="20"/>	<input type="text" value="200"/>
S2	<input type="text" value="15"/>	<input type="text" value="16"/>	<input type="text" value="23"/>	<input type="text" value="251"/>
S3	<input type="text" value="15"/>	<input type="text" value="15"/>	<input type="text" value="19"/>	<input type="text" value="223"/>
S4	<input type="text" value="13"/>	<input type="text" value="14"/>	<input type="text" value="9"/>	<input type="text" value="282"/>
Demand	<input type="text" value="267"/>	<input type="text" value="292"/>	<input type="text" value="397"/>	

Calculate

Total Minimum Cost

(282 × 9 + 200 × 12 + 115 × 19 + 67 × 15 + 184 × 16 + 108 × 15)

12692

Using excel solver

		Al rai	Al dajeej	Al fahaheel	
		D1	D2	D3	Supply
Al-Ammary Gen.Trading & Cont.Co	S1	12	14	20	200
Hamza Mukamis Est.	S2	15	16	23	251
Communique Kuwait	S3	15	15	19	223
Fathima imports and exports	S4	13	14	9	282
	Demand	267	292	397	

Total Supply	956
Total Demand	956

		Al rai	Al dajeej	Al fahaheel			
		D1	D2	D3	Lhs	Relation	Supply
Al-Ammary Gen.Trading & Cont.Co	S1	200	0	0	200	=	200
Hamza Mukamis Est.	S1	67	184	0	251	=	251
Communique Kuwait	S2	0	108	115	223	=	223
Fathima imports and exports	S3	0	0	282	282	=	282
	lhs	267	292	397			
	Relation	=	=	=			
	Demand	267	292	397			

Total min. cost: 12692

Using Tora

TORA File EditGrid

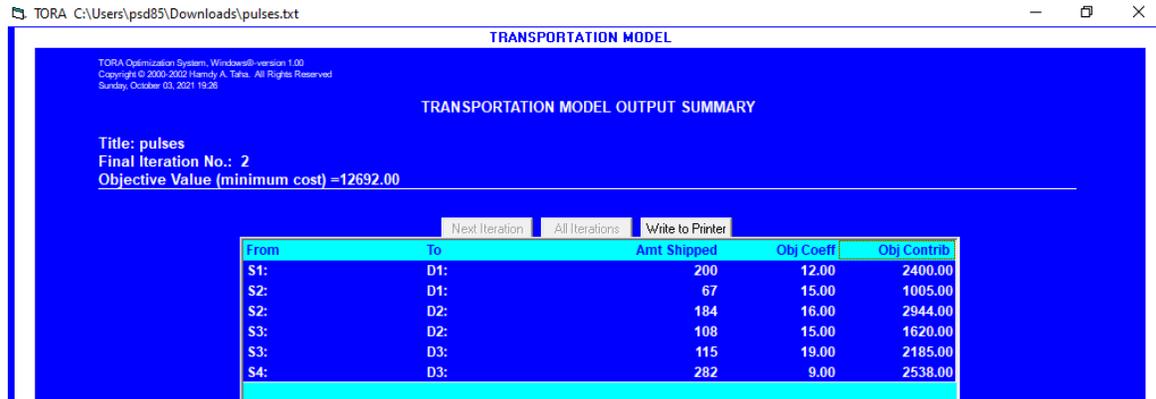
- □ ×

TRANSPORTATION MODEL

Problem Title: <input type="text" value="pulses"/> No. of Sources: <input type="text" value="4"/> No. of Dest'ns: <input type="text" value="3"/>	Editing Grid: >> To DELETE, INSERT, COPY, or PASTE a column(row), click heading cell of target column(row), then invoke pull-down EditGrid menu >> For INSERT mode, a single(double) click of target row/column will place new row/column after(before) target row/column.
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INPUT GRID - TRANSPORTATION

	S/D Name	D1	D2	D3	Supply
S1		12.00	14.00	20.00	200
S2		15.00	16.00	23.00	251
S3		15.00	15.00	19.00	223
S4		13.00	14.00	9.00	282
Demand		267	292	397	



From	To	Amt Shipped	Obj Coeff	Obj Contrib
S1:	D1:	200	12.00	2400.00
S2:	D1:	67	15.00	1005.00
S2:	D2:	184	16.00	2944.00
S3:	D2:	108	15.00	1620.00
S3:	D3:	115	19.00	2185.00
S4:	D3:	282	9.00	2538.00

Minimum cost = 12692

V. CONCLUSIONS

Thus can conclude that excel solver , Tora other online platforms provided the same Total minimum cost and a direct optimal solution in fewer iterations for the transportation problem .

Like in this case the excel solver method takes less time and is very easy to understand and apply.

so here we applied Excel solver method and solved the transportation problem and optimized transportation costs of LULU stores with ease. Decision makers who deal with logistics and supply chain problems can make use of this method to optimize transportation costs.

We tried to analyze the market situation by considering the demand hypothetically and it's supply so that we could optimize the transportation costs as taken in the question by solving it using the excel solver in order to get the most feasible solution.

References

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