



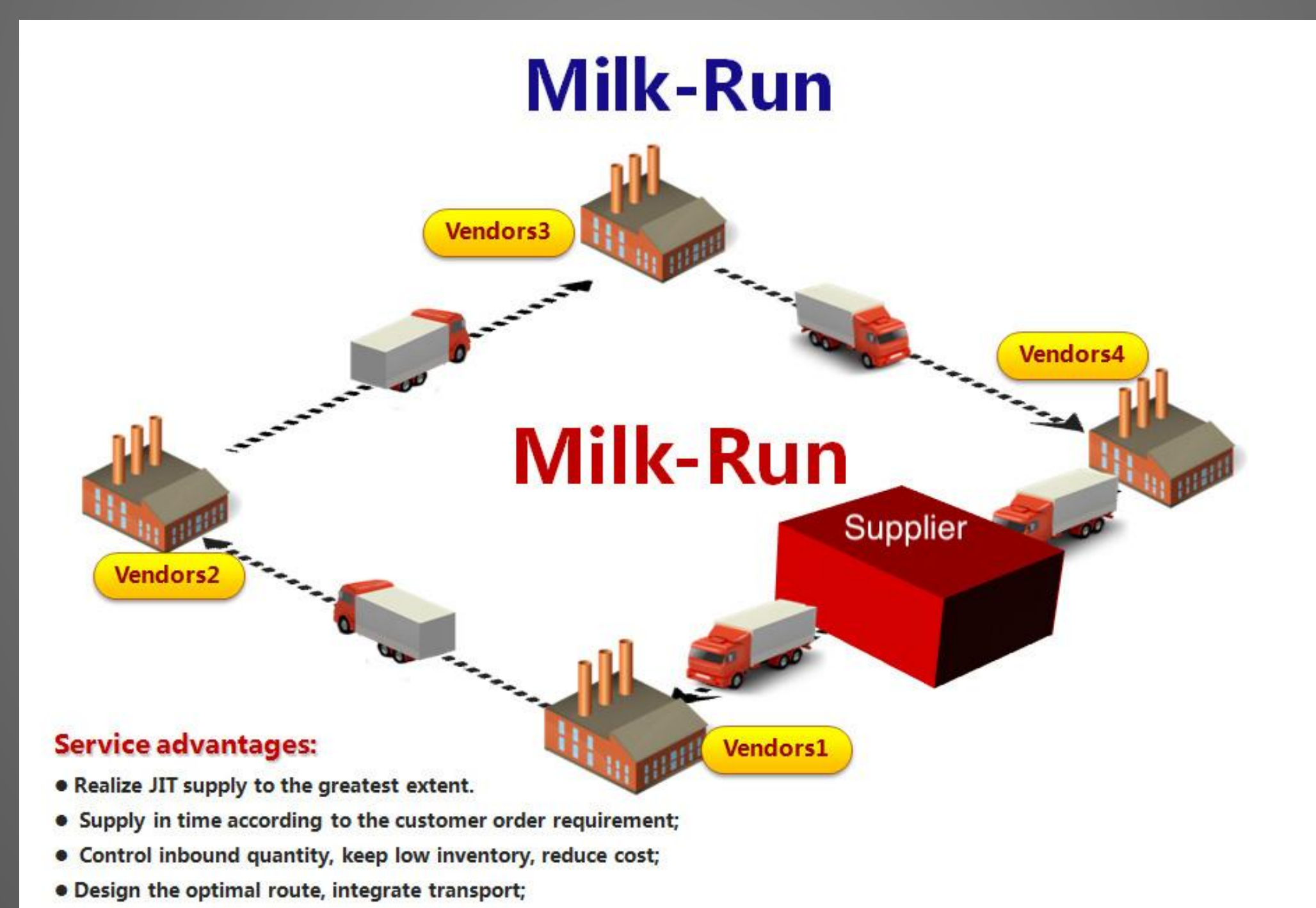
OPTIMIZING DELIVERY ROUTES BY APPLYING MILK RUN METHOD



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Introduction:

- Efficiency of the optimal route to generate effective delivery
- Analyze the delivery route by using the milk run method.
- Involved one manufacturer/supplier and four delivery routes



Conclusion/Results:

- Concluded that the optimal shipping routes combine both yellow and red routes
- Created a excel template that can be modified if changes to locations occur.

S.G Torrice Company Transfer Schedule

BR #	Distance
2	2.6
10	17.1
12	18.5
TOTAL	38.2

BR #	Distance
7	2.6
11	21.9
4	25.3
5	69.3
7	20.2
TOTAL	149.4

BR #	Distance
12	2.6
4	25.3
5	69.3
7	20.2
TOTAL	117.4

BR #	Distance
2	2.6
6	12.7
7	48.8
14	35.8
2	4.3
TOTAL	104.2

BR #	Distance
12	2.6
4	25.3
5	69.3
7	20.2
TOTAL	117.4

Materials and Methods:

Nondeterministic Polynomial Time (NP) Hard Problem:

- Find the shortest route
- Visits every location exactly once
- Return to the origin

Using Excel Solver Evolutionary Method to optimize the transportation routes

Solver Parameters

Set Objective: \$I\$22

To: Max Min Value Of

By Changing Variable Cells: \$K\$16:\$K\$25

Subject to the Constraints: \$K\$16:\$K\$25 = integer

Select a Solving Method: Evolutionary

Solving Method: Select the GRG Nonlinear engine for Solver Problems that are smooth nonlinear. Select the LP Simplex engine for Linear Solver Problems, and select the Evolutionary engine for Solver problems that are non-smooth.

All Routes Optimization

From Node	To Node	Distance
0	1	30.2
0	2	26.1
0	3	22.8
0	4	25.8
0	5	35.1
0	6	48.3
0	7	88.7
0	8	117
0	9	130
0	10	184
1	2	46.7
1	3	43.7
1	4	45.8
1	5	55.4
1	6	66.7
1	7	109
1	8	126
1	9	141
1	10	202
2	3	16.6
2	4	18.7
2	5	28.4
2	6	41.6
2	7	82.6
2	8	99.2
2	9	114
2	10	170
3	4	13.1
3	5	15.2
3	6	24.9
3	7	46.7
3	8	63.3
3	9	78.3
3	10	134
4	5	10.5
4	6	12.6
4	7	22.3
4	8	38.9
4	9	53.9
4	10	109
5	6	7.9
5	7	17.6
5	8	34.2
5	9	49.2
5	10	105
6	7	5.3
6	8	15
6	9	31.6
6	10	46.6
7	8	2.7
7	9	12.4
7	10	27.4
8	9	0.1
8	10	10
9	10	5.4
TOTAL		151.2

BR#	ADDRESS	CITY/TOWN	STATE
0	80 INDUSTRIAL WAY	WILMINGTON	MA
1	81 YORK AVENUE	RANDOLPH	MA
2	24 FLAGSTONE DRIVE	HUDSON	NH
3	1 FIRST AVENUE	PEABODY	MA
4	600 WEST STREET	MANSFIELD	MA
5	71 BODICK ROAD	HYANNIS	MA
6	115 HERITAGE AVENUE	PORTSMOUTH	NH
7	30 NORTHAMPTON STREET	BOSTON	MA
8	300 NIANATIC AVENUE	PROVIDENCE	RI
9	7 LOPEZ ROAD	WILMINGTON	MA
10	164 LOCKE DRIVE	MARLBOROUGH	MA

Orange Route Optimization

From Node	To Node	Distance
0	1	26.1
0	2	49.7
0	3	2.6
0	4	17.1
1	2	26.1
1	3	55.9
1	4	25.8
2	3	49.7
2	4	50.2
3	4	59.8
4	0	18.5
4	1	2.6
4	2	59.8
4	3	18.5
TOTAL		161.2

BR#	ADDRESS	CITY/TOWN	STATE
0	80 INDUSTRIAL WAY	WILMINGTON	MA
1	24 FLAGSTONE DRIVE	HUDSON	NH
2	115 HERITAGE AVENUE	PORTSMOUTH	NH
3	7 LOPEZ ROAD	WILMINGTON	MA
4	30 NORTHAMPTON STREET	BOSTON	MA

Individual Route Optimization

	Original Distance	Optimal Distance
Purple Route	191.4 miles	179.2 miles
Red Route	137 miles	134 miles
Yellow Route	38.5 miles	38.5 miles
Green Route	146.5 miles	143 miles
Orange Route*	172.5 miles	161.2 miles