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DEVELOPMENT OF A MODEL TO OPTIMIZE THE SUPPLY CHAIN TRANSPORTATION COST

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ABSTRACT

The main objective of this research is to develop a mathematical model for supply chain transportation costs. This model considers the real time data of the transportation cost incurring elements which helps in achieving optimization. Though it has been case studied for a particular company but it's been generalized for all aspects of supply chain network under some specific conditions. In this research Theory of Constraint (TOC) has been applied to identify the main constraints to its goal. The main constraints are found supply chain transportation cost which significantly impact on supply chain profit. Thinking process has been developed to propose a conceptual model regarding the constraints. The case study has been performed for30 days and found 32.68% better results for one complete transportation cycle compared to existing transportation modes. The ways the model optimize the transportation cost by managing vehicle route, fleet size and number of moves throughout the transportation network. Finally, this model offering significant results in throughput accounting of supply chain transportation that leads to optimize overall supply chain costs.

Keywords: *Mathematical model, Optimization, Supply chain, Transportation cost, Transportation network*

1. INTRODUCTION

Transportation can be defined as the movement of item from one locality to another to make the product obtainable to the customer. There are five basic modes of transportation: Rail, Road, Air, Water and Pipeline. Each transportation mode has distinguished service characteristics (Shaik and Kader, 2013). Parkhi *et al.* (2014) studied on transportation costs optimization in retail distribution. According to them cost factors in supply chain transportation network are truck volume utilization, fleet utilization, route optimization, turnaround time (TAT), backhauling, information technology. Simchi-Levi *et al.* (2008) provides the 7 Factors of Solid Supply Chain Network Design: location and distance, current and future demand, service requirements, size and frequency of shipment, warehousing costs, trucking costs, mode of transportation. The key to the success of supply chain network design project is the experienced consultants that help you to gather high quality data, validate model and propose the alternative supply chain structure that matters to your business (Ballou, 1995& 2001).

Many past studies have been dedicated to determining how to achieve the lowest possible transportation cost. For example, (Pilot C and Pilot S, 1999) focused on minimizing the total costs involved in a transportation problem. Chanas and Kuchta (1996) proposed what they see as an optimal solution to the transportation problem, which makes use of fuzzy cost coefficients and an algorithm determining the nature of the solution. McCann (2001) addressed two interrelated questions: the optimum size of a vehicle or vessel and the structure of transportation costs with respect to haulage distance. Dubey *et al.* (2014) offers a model for sustainable supply chain network where it describes about maximizing the supply chain surplus (economic) and minimizing the carbon emission (environmental). Wang *et al.* (2011) introduced a green supply chain network design model based on the classical facility location problem for the firm's strategic planning. The distinguishing feature of our model is its consideration of environmental element which includes environmental level of facility and environmental influence in the handling and transportation process.

Alvarenga *et al.* (2007) proposed a robust heuristic approach to vehicle routing problems with time windows, using travel distance as the main objective through an efficient genetic algorithm and a set partitioning formulation. Ghoseiri and Ghannadpour (2010) presented a new model and solution for multi objective vehicle routing problem with time windows (VRPTW) using goal programming and genetic algorithm, in which decision makers specify optimistic aspiration levels to objectives and deviations from those aspirations are minimized. They used a direct interpretation of VRPTW as a multi objective problem, in which both total required fleet size and total traveling distance were minimized, while capacity and time-window constraints were secured. Al-Khayyal and Hwang (2007) formulated a model for finding the minimum-cost route in a network for a heterogeneous fleet of ships engaged in the pickup and delivery of several liquid bulk products. They showed that the model can be reformulated as an equivalent mixed-integer linear program with a special structure. Yu *et al.* (2011) proposed a hybrid approach, which consists of ant colony optimization (ACO) and Tabu search, to solve VRPTW. Chiang and Hsu (2014) proposed their own approach to solve a multi objective vehicle routing problem with time windows. The objectives were to simultaneously minimize the number of

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vehicles and the total distance. Their approach was based on an evolutionary algorithm and it aims to find a set of Pareto optimal solutions. Because of the many applications of different vehicle routing problems, a large number of researchers have focused on developing solutions to them.

Useful techniques for solving general vehicle routing problems can be found in (Ombuki *et al*., 2006). Dubey *et al.* (2013) Supply Chain Management may be defined as the management of upstream and downstream associations with vendors and customers to provide better customer value at least cost to the supply chain.

Chopra (2003) describes a framework for designing the distribution network in a supply chain. In this research various factor influencing the choice of distribution network are described. He identified the distribution networks that are best suited for a variety of customer and product characteristics. Zeng and Rossetti (2003) classified the key logistics cost elements into six categories, namely transportation, inventory holding, administration, customs charges, risk and handling and packaging costs. Simatupang (2004) established the abbreviation that Supply chain collaboration amongst independent firms or business units often provides larger benefits from effectively satisfying end customer needs than working in isolation. However, Chen *et al.* (2004) shown Supply chain management is not only limited to Logistics activities and planning and control of materials and information flow internally within the company or externally between companies. It also deals with the strategic decisions such as inter organizational issues, alternative organizational form to vertical integration. It is also the management of relationship between suppliers and customers. Taylor (2004) provides a manager guide on supply chain in his research. He argued that the main supply chain dilemma in the SCM according to theory of Constraints is the bullwhip effect. Usually, the impact of the decisions made on the above scenario is the demand amplification to upstream SC's partners. This effect is known as bullwhip effect that causes a negative impact by increasing the level of safety in the inventory and/or damage in the service level, increasing the lack of products. Taylor (2004) suggests that managerial systems have parameters or attributes that present a natural variability, even when well administrated. In fact, managers make decisions based on average information about those parameters, such as average daily sales, average delivery time and average productivity.

According to (Merzouk *et al.*, 2006) three costs are considered as supply chain transportation costs which are: the holding cost at the supplier end, the holding cost at customer end and the carrying cost. Sahyouni *et al.* (2007) developed three generic facility location models for the integrated distribution and collection of products. The models quantified the value of integrated decision making in the design of logistics networks by focusing on facility and transportation costs throughout different stages of a product's life cycle. Based on the previous literature supply chain cost can be divided in two main categories. a) Distribution costs: which is generally logistics cost. b) Inventory value and inventory holding costs: which mainly consist of cost of inventory and cost of keeping inventory in storage location (Parkan *et al.,* 2009). Dos Santos *et al.* (2010*)* collaboratively applied TOC, VMI and B2B tools to improve the global supply chain performance.

The integration and visibility of the information among customer, supplier and company is possible through Vendor Managed Inventory (VMI) and Business to Business (B2B). Customer integrated system model brought a reduction in all inventory level with consequent reduction of the logistics costs and provoked an impact directly on the final sale costs (Dos Santos *et al.*, 2010). Jha *et al.* (2012) considered a joint-location inventory problem and minimized the transportation cost involved in a joint inventory location model by using a modified adaptive different evolution algorithm. Nowakowska *et al.* (2013) showed TOC as an effective tool for supply chain management. He has given consent that better results of SCM depend on all involved parties rather working in isolation. According to them "Lack of awareness about the constraints along SC, decreases the benefits of collaboration". According to (Hua *et al.*, 2014) distribution network in retail perspective includes the transportation from distribution center with a multivehicle distribution vehicle delivery to multiple stores. It should satisfy the following conditions: (1) Demand does not exceed the carrying capacity (2) The length of each distribution route delivery vehicles does not exceed the maximum travel distance delivery time (3) Each delivery of goods cannot exceed the time required. Yan *et al.* (2015) developed a bi-objective model for transportation costs. This model considering the time window's constraints that specify the earliest and latest arrival times of customers. The simultaneous minimization of fleet size and total transportation cost are considered as objective functions. Kuldeep *et al.* (2016) working on eliminating the bottlenecks from the constraints resources was the solution to cope up with the increased demand by applying Theory of Constraints to improve the productivity of component under consideration.

After going through several literatures review transportation costs can be defined as the subsets of transport cost, handling costs, wastage costs and inventory holding costs both supplier and customer ends (Merzouk *et al.*, 2006). Transportation and logistics are seen as important factors for trade and investment as they facilitate the distribution of products. Total cost of the supply chain largely depends on the transportation cost. In the supply chain transportation network, extra vehicle may unnecessarily run from the main distribution center again vehicle may run short to fulfill the customer demand. This is due to not following the proper vehicle management system. The real time data about the demand, capacity of the warehouse, no. of vehicle required are not taken under considerations that result in excess inventory costs along with transport costs. Transportation mode and network play an important role in that case and definitely impacts on supply chain responsiveness. The damage rate of the products depends on the modes of transportation. So this is another most important area for considerations. The handling part of the supply chain also responsible for the product damage. If we can reduce the handling times it will leads to reduction in overall transportation costs.

From the above discussion, it is clear that there is a trade-off necessary between the cost of the supply chain and transportation costs. Moreover, in different stages of the supply chain it is also necessary to increase the value of the overall supply chain profit. As a result, a general transportation network has been designed under some assumptions identifying transportation cost as a main constraint of the company and given effort to optimize between carrying, handling, wastage and inventory holding costs. Accordingly, a mathematical model has been developed to optimize the supply chain transportation costs. On based on my knowledge, no study has considered together the three distinct elements of the transportation costs and made a linkage among them. The distinguished features of this model are: (1) this model offer best utilization vehicles that approaches the model to achieve more optimality and (2) applicable for any transportation modes and network under some specific conditions.

2. MODEL FORMULATION

2.1 Assumptions of this model

This research assumes that a single supplier logistics enterprise for transportation process. The logistics enterprise distributes goods to customer according to the requirements.

i. The demand is certain or known.
ii. The model is not depending on high demand on seasonal time and low demand on non-seasonal time.
iii. The possibility of happening abnormal supply chain disruption like political crisis, natural disaster, sudden accident or uncertain delay at any time is not taken under considerations.
iv. Every route will start and ends at the central depot.

2.2 Optimization Criteria

Consider a simple transportation network model consisting of one central depot (CD) and two customers i& j respectively which has been depicted in Figure 1. Assume that every route will start and ends at the central depot. So there can be two possible routes: i) CD to i to j to CD and ii) CD to j to i to CD. Each of the arrows in the following network represents the transportation between customers.

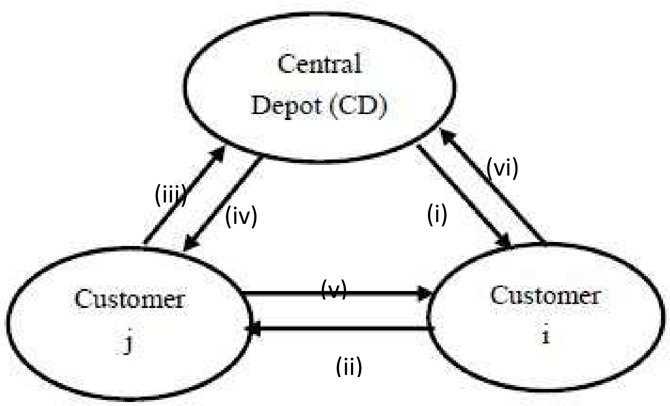

Figure 1: A simple network representation of the transportation process.

This model follow the real time data of the customers demand, number of vehicle required, capacity of the vehicle, capacity of the customer node, inventory holding status etc. Firstly, this model calculates the total demand on the customer node and total number of vehicle required considering the vehicle capacity. If the total demand of the customer node exceeds the capacity of the central depot then it will lose customer and proceed to the customer followed by the feasible amount.

Then this model decide which customer node should be visited or not? If yes it will check the next step whether the existing vehicles are capable or not? Besides it will consider the route it will proceed to (forward or backward?). For any transportation between two nodes will incur two costs that is transport cost and handling costs. Inventory holding costs can also be incurred accordingly to the requirements of inventory on that node.

One important thing is that, if any vehicle being empty after a certain period then it will consider unnecessary movement of the vehicle. If the path distance for the vehicle in the forward directions are less and will incur less costs it will proceed to forward. Likewise, it will return backward for the opposite scenario. The more the customer node, the transport cost approaches to more optimality. This is one of the distinguish feature of this model. The conceptual model for transportation mode and network are shown in the following figure 2:

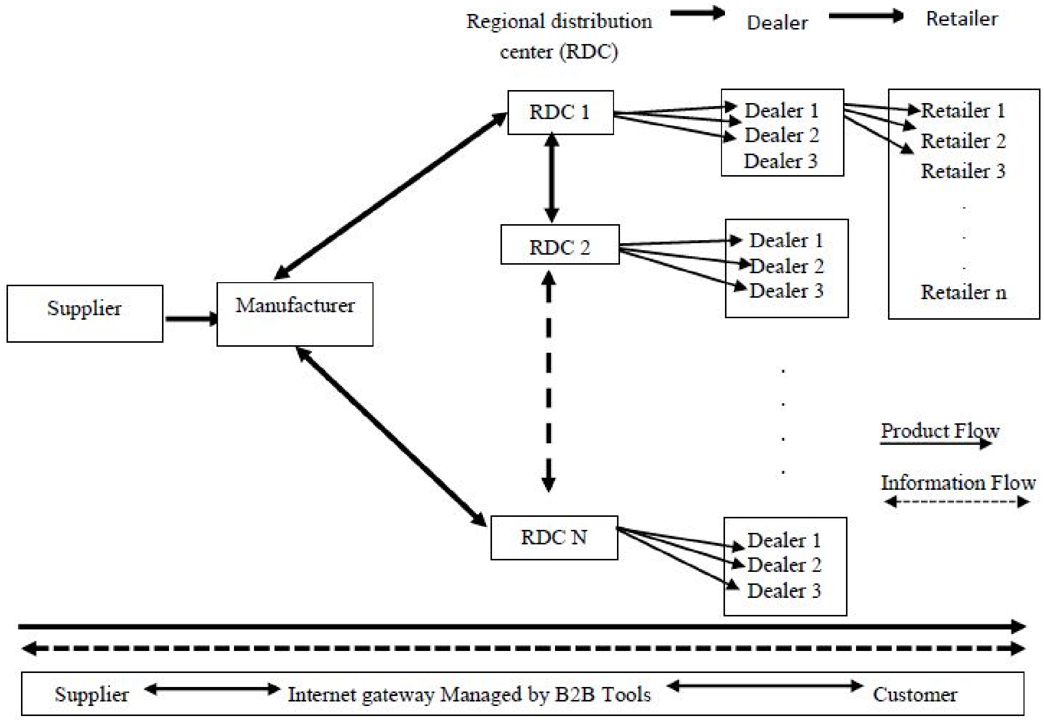

Figure 2: Conceptual Model for Transportation Modes and Networks

2.3 Mathematical Model

For n+1 number of customers and n number of vehicle this model can easily optimize the total transportation cost of supply chain. In order to optimize the transportation cost the vehicle route and capacity must be determined as the customer number for a route is uncertain.

The objective function (equation number1) defines the aggregate costs of the entire chain and consisting of three elements. First one (transport costs): costs associated with transporting goods to customer nodes to nodes. The second element (inventory holding costs): The cost associated with holding/carrying goods on the customer nodes if it is required. The third elements (handling costs): costs associated with overall handling for a complete cycle (average wastages costs, average loading and unloading costs, average packaging, labeling, billing & collecting, administration costs etc.).

Notations:

D_i = Demand per unit; V_{count}= No. of vehicle to dispatch; T_c = Transport cost for each node per vehicle; H_i = Handling cost for each node per unit demand; V_{return} = No. of vehicle to return; V_{inv} = Amount of inventory required; C_{inv} = Inventory holding cost per unit; H_0 = Initial handling at central depot; T_0 = Transport cost from last node to central depot;

$$Xi = \begin{cases} 1, & \text{Proceed to the customer node} \\ & 0, \text{otherwise} \end{cases}$$

$$Yi = \begin{cases} 1, & \text{Inventory holding required} \\ & 0, \text{otherwise} \end{cases}$$

The main objective of this model is to minimize the transportation cost. This model can be written as:

$$\text{Min } Z= \sum_{i=1}^{n} Vcount * \sum_{i=1}^{n} Xi * \sum_{i=1}^{n} Tc + \sum_{i=1}^{n} Vreturn * \sum_{i=1}^{n} Tc + \sum_{i=1}^{n} Di * \sum_{i=1}^{n} Xi * \sum_{i=1}^{n} Hi + \sum_{i=1}^{n} Vinv * \sum_{i=1}^{n} Yi * \sum_{i=1}^{n} Cinv + (H_0 + T_0) \quad (1)$$

Constraint-1: Every route starts and ends at the central depot

$$\sum_{i=1}^{n} Xi = \sum_{i=1}^{n} Xi \leq 1 \quad (2)$$

Constraint-2: Vehicle capacity constraint

$$\sum_{i=1}^{n} Di * \sum_{i=1}^{n} Xi \leq \sum_{i=1}^{n} Vi \quad (3)$$

Constraint-3: Warehouse capacity constraint

$$\sum_{i=1}^{n} Di * \sum_{i=1}^{n} Xi \leq \sum_{i=1}^{n} Wi \quad (4)$$

Constraint-4: Vehicle return constraint

$$\sum_{i=1}^{n} Di * \sum_{i=1}^{n} Xi = \sum_{i=1}^{n} Vi \quad (5)$$

Algorithm:

Step-1: Start the program
Step-2: Define capacity of central depot (CD)
Step-3: Input number of demands/nodes/stations (D_n) and value of demands on each stations (D_i)
Step-4: If total demand ($\sum_{i=1}^{n} Di$) ≤ capacity of central depot (CD) go to step-5 or take feasible demands only by reducing no. of stations (D_n), then go to step-5.
Step-5: Input no. of vehicles (V_n) and its capacity (V_i)
Step-6: If total demand ($\sum_{i=1}^{n} Di$) ≤ ($\sum_{i=1}^{n} Vi$) total vehicle capacity go to step-7 or reduce D_n to feasible limit, then go to step-7.
Step-7: Select route

i. Start from first node (CD >1>2>………n>CD)
ii. Start from last node (CD>n>n-1>……>1>CD)

Step-8: Define warehouse capacity for all nodes/stations (W_i)
Step-9: If ($W_i \geq D_i$) go to the next node. If so, Xi= 1, otherwise Xi=0 & check for all nodes.
Step-10: Calculate optimum number vehicles for dispatch for nodes to pursue (n_i).
Step-11: Input transportation cost (T_{n+1}) for n_i nodes (T_0 included).
Step-12: Input handling cost (H_{n+1}) for n_i nodes (H_0 included).
Step-13: Ask if inventory required for nodes n_i.

i. If Yes, set Yi=1, enter amount of inventory (V_{inv}) and cost per unit inventory required (C_{inv}). Then go to step-14.
ii. If No, set Yi=0, go to step-14

Step-14: Calculate optimum transportation cost for vehicles to pursue (V_{count}) for nodes n_i. Take return vehicle cost (V_{return}) into account as well.
Step-15: Calculate total cost

Min Z= $\sum_{i=1}^{n} Vcount * \sum_{i=1}^{n} Xi * \sum_{i=1}^{n} Tc + \sum_{i=1}^{n} Vreturn * \sum_{i=1}^{n} Tc + \sum_{i=1}^{n} Di * \sum_{i=1}^{n} Xi * \sum_{i=1}^{n} Hi + \sum_{i=1}^{n} Vinv * \sum_{i=1}^{n} Yi * \sum_{i=1}^{n} Cinv + (H_0 + T_0)$

3. APPLICATION OF THE MODEL – A CASE STUDY

3.1 Brief Description of the Case Company

The company that has been chosen for research case study is Abdul Monem Limited, Bangladesh (Beverage Unit-Coca-Cola). Abdul Monem Limited has become one of the most reliable, reputed and diversified conglomerates in Bangladesh with a broad portfolio of businesses that optimizes opportunities. Moreover, the company has been committed to playing a strong and responsible role in sustainability from implementing quality in infrastructure/construction projects to provide innovative products and services. The approach has been to invest in resources that will form the foundation of core values of people, prosperity and progress.

3.2 Case Analysis

The main goal of the company is to reduce costs and make sure the product is available to meet the customer demand. However, recently it has been observed that the company is unable to deliver its product quantity to customers with respect to demand in recent times. The constraints are in severe mode to lose the goodwill of the company at the peak time. The existing transportation mode and network of the company is shown in figure 3:

The five focusing steps are Identify, Exploit, Subordinate, Elevate and Repeat the Constraint along with evaporating cloud diagram is used to identify the constraints. In this case study an evaporating cloud diagram has been developed for Abdul Monem Group (Coca-Cola) which can clearly specify the conflict between two requirements. To solve the conflict between two requirements the supply chain transportation costs have to optimize.

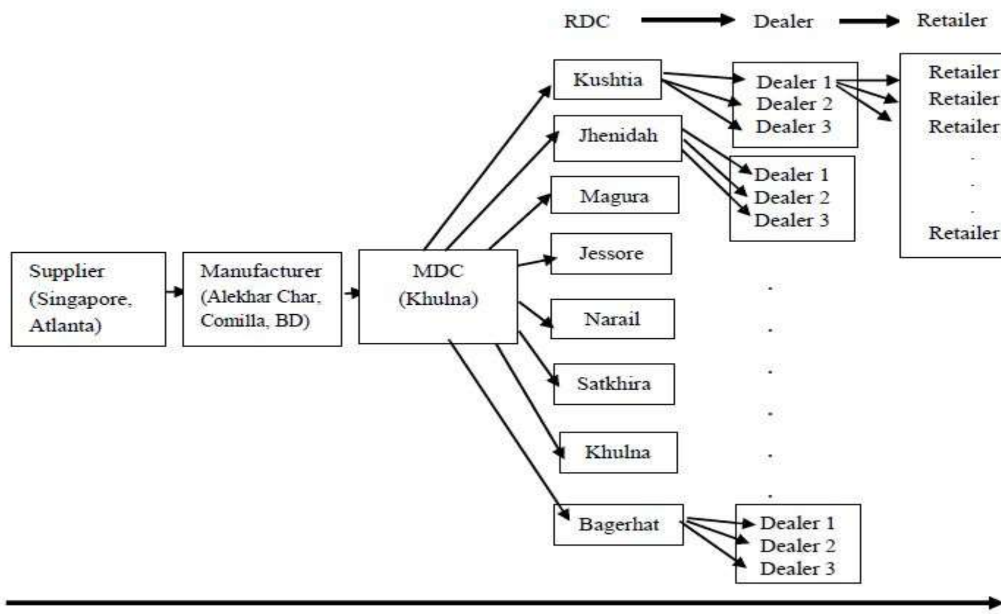

Figure 3: Existing Transportation Mode and Network

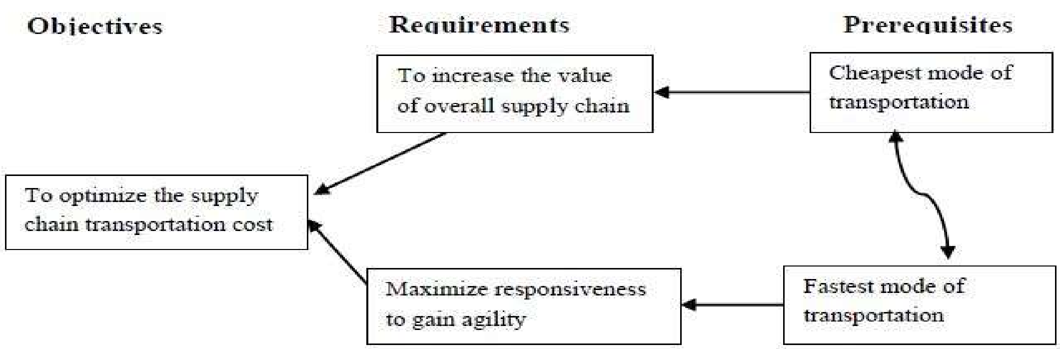

Figure 4: Evaporating Cloud Diagram for supply chain of the company

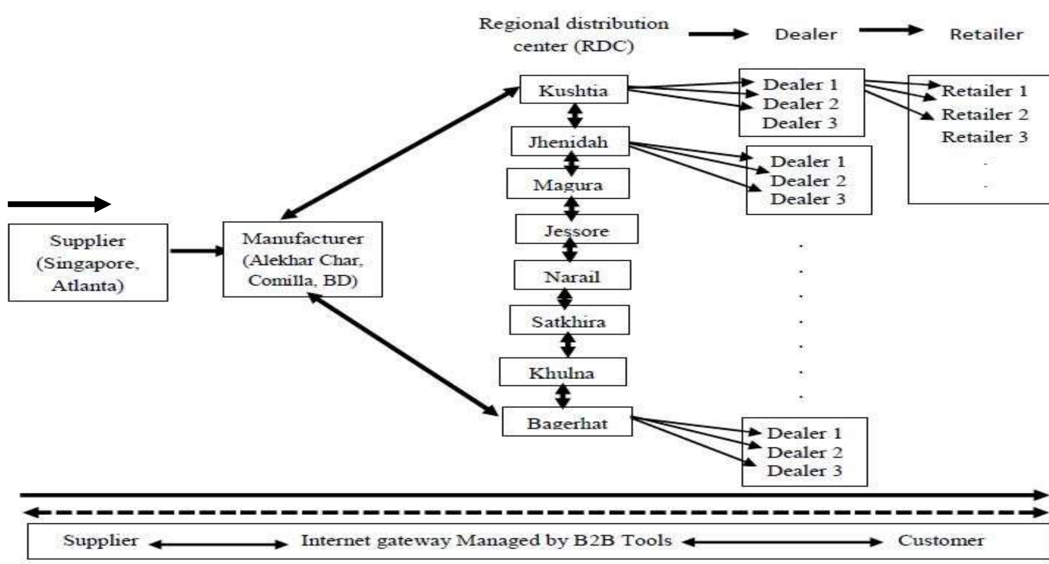

Figure 5: Proposed Transportation Modes and Networks

By analyzing the existing mode of transportation network and handling system being practiced it is obvious that for obtaining the ultimate supply chain goal the main constraints are the high transportation costs. The high transportation cost is found mainly due to the Modes of transportation (Transportation Mode: River ways) and using cargo in the river ways make the delivery time longer. The proposed transportation networks are shown in figure 5.

4. RESULT AND DISCUSSION

According to the case company's transportation modes and network there are eight regional distribution centers (eight customer nodes). Consider, the company is capable to fulfill the demand of the customer nodes by using their existing facilities. For existing modes of transportation network, first proceed to the main distribution center (Khulna) from central depot (Comilla) via ship. Then proceed to the subsequent regional distribution center via truck according to the demand. On the other hand, in the proposed mode transportation is carried out by Direct Shipment from Comilla to other regional distribution center via truck. The details about the demands (unit) and transport costs between nodes (per unit) and warehouse capacity of the respective nodes (unit) both for existing and proposed modes of network are shown in table 1.

Table 1: Experimental Data

Demands (unit) and transport costs between nodes (per unit) and warehouse capacity of the respective nodes (unit) **For existing modes and network**								
RDC	Khulna (1)	Kushtia (2)	Jhenidah (3)	Magura (4)	Jessore (5)	Narail (6)	Shatkhira (7)	Bagerhat (8)
Comilla (CD) [10500]	10000 15	0	0	0	0	0	0	0
Khulna(MDC) [10500]	1000 5 2500	1020 15 2500	1050 13 1500	1100 10 2000	1070 12 2200	1200 11 2000	1250 12 1800	1230 8 1600
Vehicle capacity (10)	V1=500, V2=700, V3=800, V4=850, V5=940, V6=1000, V7=1150, V8=1240, V9=1300, V10=1500							
Demands (unit) and transport costs between nodes (per unit), handling costs at nodes (per unit) and warehouse capacity of the respective nodes (unit) **For proposed modes and network**								
Comilla (CD) [10500]	1000 38 20 2500	1020 35 20 2500	1050 42 20 1500	1100 37 22 2000	1070 44 23 2200	1200 36 25 2000	1250 58 25 1800	1230 45 25 1600
Vehicle capacity (10)	V1=500, V2=700, V3=800, V4=850, V5=940, V6=1000, V7=1150, V8=1240, V9=1300, V10=1500							

For complete one cycle, considering all cost factors regarding transportation cost comparative scenario are illustrated in the followings: Assume, T_{ij}&D_{ij} transport costs & demand between nodes i to j

Average handling cost per unit case = 2.5 tk
Average wastage cost per unit case = 25 tk
Total transportation Costs in existing modes of transportation
Min Z = Carrying Costs + Handling Costs + Wastage Costs

=$\sum_{i=1}^{2}\sum_{j=1}^{8} Tij * Dij$+[D(1,1)+D(1,2)+D(1,3)+D(1,4)+D(1,5)+D(1,6)+D(1,7)+D(1,8)++D(2,1)+D(2,2)+ D(2,3)+D(2,4)+D(2,5)+D(2,6)+D(2,7)+D(2,8)]*loading & unloading*avg. handling costs+[D(1,1)*2%+D(1,2) +D(1,3)+D(1,4)+D(1,5)+D(1,6)+D(1,7)+D(1,8)+D(2,1)*2%+D(2,2)%+D(2,3)*2%+D(2,4)*2%+D(2,5)*2%+ D(2,6)*2%+D(2,7)*2%+D(2,8)*2%]*avg. wastage costs= 245830 + 94600 + 9460= 349890 tk.

By applying the proposed model and solving by using 'Code: blocks' version 16.01

MinZ=$\sum_{i=1}^{n} Vcount * \sum_{i=1}^{n} Xi * \sum_{i=1}^{n} Tc$+$\sum_{i=1}^{n} Vreturn * \sum_{i=1}^{n} Tc$+$\sum_{i=1}^{n} Di * \sum_{i=1}^{n} Xi * \sum_{i=1}^{n} Hi + \sum_{i=1}^{n} Vinv * \sum_{i=1}^{n} Yi * \sum_{i=1}^{n} Cinv$ + (H_0 +T_0) = 235523 tk.

Percentage of cost reduction in total transportation cost = {(349890-235523)/349890}*100= 32.68%

4.1 WHAT MAKES DIFFERENCES?

The vehicle and warehouse are considered as capable for same demand, the actual differences brought by the followings:

- Route optimization (by saving the unnecessary moves, considering the return moves)
- Changing the modes of transportation (by reducing the per unit costs, reducing the percentage of wastages, reducing handling times)
- The proposed transportation network in this research work has reduced the total transportation cost including carrying cost, handling cost, inventory holding costs & cost due to wastage from manufacturer to distributor. This also contributes a great reduction in lead time between manufacturer to distributor which results in higher product availability and lower inventory level.

Route optimization as shown in table 2.

Table 2: Route optimization

Customer Node (Demand unit)	Vehicle dispatch (Proceed: Return)	Dispatch style	Surplus/remainder
1 (1000)	1^ (9:1)	V1<1000	V1 = 0
2 (1020)	2 (8:0)	V2<1020	V2 = 180
3 (1050)	2^, 3 (8:1)	V2<180 and V3<870	V2 = 0 and V3 = 30
4 (1100)	3^, 4 (7:1)	V3<30 and V4<1070	V3 = 0, V4 = 80
5 (1070)	4, 5 (6:0)	V4<80 and V5<990	V4 = 0 and V5 = 510
6 (1200)	4, 5, 6, 7 (6:0)	V5<510, V6<500 and V7<190	V5 = 0, V6 = 0 and V7 = 660
7 (1250)	4, 5, 6, 7, 8 (6:0)	V7<660 and V8<590	V7 = 0 and V8 = 460
8 (1230)	4, 6, 7, 8, 9 (6:0)	V8<460 and V9<770	V8 = 0 and V9 = 90

Vehicle Capacity: V1=1000, V2=1200, V3=900, V4=1050, V5=1500, V6=500, V7=850, V8=1050, V9=860, V10=1240

Results:
9 vehicle required to meet the demand
No. of possible moves in forward (without return): 9*(8+1)= 81
No. of moves in forward (with return): 9+8+8+7+6+6+6+6 = 56
No. of moves in backward (with return): (1+1)+ (3+3)+(4+4) = 24
Total no. of moves= 56+24 = 80
% of moves saved= (90- 80)/90 = 11.12 %

Symbols:
< Indicates assign value
^ Indicates return backward

5. CONCLUSIONS

In this research a mathematical model proposed to optimize the supply transportation costs. This optimized mathematical model has been developed considering transportation cost elements and real time data of the entities under some specified conditions. For existing supply chain transportation modes and network tools of TOC are applied to find out the constraints. Mitigation strategies regarding that constraint have been proposed using thinking process by developing a conceptual model. According to this tools the proposed modes and network are respectively truck loads and direct shipment network. A case study has been performed to verify the feasibility of the model during 30 days. The result obtained from the developed model compared to the existing modes of network and found better results. This model is solved by using code blocks (version 16.01) and it's very easy to interpret and integrate with any means of software. This model leads to reduction in lead time, reduction in damage, reduction in no. of handling times and thus helps in achieving optimum SC transportation costs. This model gives 32.68 % better results under the same facilities compared to existing one though it has been considered in short range. The more the customers, the more the results will approaches to optimality. This model would be more generalized if we consider the variable costs.

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