Automotives Routing Optimization Among BRICS Countries: A Literature Review

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Abstract - **Supply chain management has encircled the activities beginning from purchasing, procurement, manufacturing operations, production scheduling, inventory control, material management, facility location planning, and information technology by coordinating between supplier, manufacturer, wholesaler, retailers and end-users and here this paper's Endeavour is exploratory in nature, and consisted mainly of a exhaustive quest on challenges faced by the leading emerging automotive modular manufacturers (AMMs) and automotive integral manufacturers (AIMs) in the coined countries and emphasizes the inventory maneuver barriers which evolve the myriad of challenges particularly in Automotive sector in BRICS countries by collecting the substantial obstacles of individual country which are not cost efficient from supply chain side, cusp is logistic and transportation cost, also explores the possibility that the automotive industries are ready for a model change, followed by narrative to optimize the logistics cost from temporal and economic side, which in turn results in significant cost reduction opportunities, giving them a cost advantage over competitors.**

Key words: Automotive, modular, integral, logistics, narrative, exploratory

1. INTRODUCTION

The BRICS members are all developing or newly industrialised countries, but they are distinguished by their large, fast-growing economies and significant influence on regional and global affairs. The coined term enhance towards emerging power, maximum trading among them with their local currencies, even though each nation must have their own export-import trading policies, network, route and protocols. According to today's economical surveys, BRICS nations have already secured a place because of their market opportunities and planned to achieve global stability with Security and prosperity or in other sense establish a more balanced and inclusive world by expanding cooperation and sharing knowledge in the area of national security, finance, agriculture, health, trade and education (BRICS Summit). Making efforts towards achieving the BRICS summit agendas, shared prosperity and enhanced trading with sharing the strengths of coined countries to overcome weakness of each other, we should focus on making unified intra routing model to minimize cost of the cargo and making available within defined lead time.

2. BRIEF COMPARISON OF BRICS COUNTRIES.

Country/ Currency	Unit	Year	Value
(GDP Prices)			
Brazil(Real)	Trillion (US$)	2011	2.294
Russia(Ruble)	Trillion (US$)	2011	2.38
India(Rupee)	Trillion (US$)	2011	1.848
China(Yuan)	Trillion (US$)	2011	11.299
South Africa(Zar)	Billion (US$)	2011	422
Iron Ore Production			
Brazil	Million tonnes	2009	341
Russia	Million tonnes	2011	104
India	Million tonnes	2010	30
China	Million tonnes	2011	1327
Petroleum Production			
Brazil	Million tonnes	2010	104
Russia	Million tonnes	2011	509
India	Million tonnes	2009	34
China	Million tonnes	2011	204
South Africa	Million tonnes	2007	26
Electricity Production			
Brazil	Billion KWH	2010	475
Russia	Billion KWH	2011	1051
India	Billion KWH	2009	906
China	Billion KWH	2011	4700
South Africa	Billion KWH	2010	260
Cultivated Land(Million Hectares)			
Brazil	Million Hectares	2010	65
Russia	Million Hectares	2010	121
India	Million Hectares	2008	156
China	Million Hectares	2008	122

3. LITERATURE REVIEW

3.1 Vehicle routing problem

Marielle et al. [1] proposed robust schedule to minimize ship staying idle time in ports at the end of week also suggesting a penalty for ships arriving at close to weekends. Lief et al. [2] used integer Programming and branch and bound method to solve vessel scheduling problem by branching on one of essential fractional variables and using decomposition algorithm bounds are obtained. Dusan et al. [3] implemented Fuzzy logics system in solving traffic and transportation problem and analyzed the result achieved. David et al. [4] compiled the contribution made by researchers in last decade in area of ship scheduling and related problems. Considering the complexity issues in computational, Harilaos et al. [5] developed an algorithm for single vehicle routing and scheduling problem with time constraints.

Si-Hwa et al. [6] considered an optimization based decision support system for ship routing and
Scheduling. Katarina et al. [7] made efforts to determine the work stress for the dispatcher and improving the quality prompt decision by developing feasibility dispatch decision support system. K. Fagerholt et al. [8] presented a approach considering of two phase ship scheduling and allocation problem to minimize the transportation cost by using set portioning approach. Leif et al. [9] described algorithm for solving ship scheduling problem by using Daxtzig Wolfe decomposition method for linear programming and network flow problems by dynamic programming. Marielle et al. [10] presented an optimization based solution for combined multi-inventory model with multi vehicle pickup and delivery problem with time window. Dano Bausch et al. [11] spread sheet interface followed by optimization based decision support system along with an integer linear et portioning model to complete loading and deliveries at minimum cost.

Louis et al. [12] presented operators searching large neighbor hoods to solve the vehicle routing problem by using pruning and propagation technique based on constraint programming to allow an efficient search of problem to avoid local minima. Zbigniew j.et al. [13] solved vehicle routing problem by using parallel simulated annealing algorithm with objective of the best route finding or minimum time. Shih- Wei et al. [14] considered the simulated annealing as a heuristic to solve the vehicle routing problem with time window and belongs to class of NP- hard problems als concluded that SA produces high quality solutions with minimum time. Petrica et al. [15] provided two models based on integer programming for vehicle routing problem are node formulation to produce a stronger lower bound and flow formulation to total routing time.

R. Nallusamy et al. [16] converted multiple vehicle routing problem in to vehicle routing problem by using clustering algorithm and further Genetic algorithm applied to obtain most optimal value and conclude that GA is best heuristic due to constructive nature and extensive search. A. Bachem et al. [17] presented simulated trading approach with additional constraints to solve vehicle routing problem. Marcin et al. [18] solved routing problem with very high quality solutions by using new simulated annealing algorithm with conclusion that SA can be applied to bi-criterion optimization problems. Jean Berger et al. [19]

introduces systematic diversification for routing problem where objective is to design least cost routes for a vehicle from one loading node to other unloading node.

Ana Moura et al. [20] focused to minimize the total distribution cost for short shipping that belongs to type of routing problem with delivery dead line and loading constraints. Problem carries two major aspects, one is which port must be visited by each vehicle and second one, how to load the containers to prevent over stowing, solved by mixed integer programming model. H. Nazif et al. [21] implemented GA to solve vehicle routing problem with time and capacity constraints, based on objective to find route for vehicle to serve all customers at minimum cost. Zdenka et al. [22] presented mathematical model for solving the optimal cargo transport problem with keeping the route, no of containers predefined with objective of obtaining maximum ship profit and to increase efficiency of container ship operations. Anu Chaudhary et al. [23] found the shortest path in the network analysis and proposed GA based strategy to find minimum time consuming route between two nodes.

3. PROBLEM DEFINITION

In our study we have to manage logistic among BRICS countries so that goods can be transported within optimized path with maximum delivery and minimum transportation cost within minimum time. For this purpose we have to optimize routing by using meta-heuristic approach and supported by software programming.

CONCLUSION

Specific province literature review has been carried out to explore the contribution of researches and to define the problem which can link with our agenda “broad vision and shared prosperity among BRICS countries to enhance trading between coined term by making optimal intra shipping route for defined countries with the help of proposed meta-heuristic and software programming. These efforts are intended to provide beneficial aspect for five nations regarding optimal route, which includes minimum cost, use of maximum capacity, consideration of lead time and delivery within expected time.

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