

FINDING COMMON GROUND FOR ALIGNMENT OF SUPPLY CHAIN PARADIGMS

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Abstract

In last two decades there is major shift in terms of manufacturing; because almost all kind of manufacturing has been shifted to countries having lowest production cost. But this phenomenon has posed many challenges to Global Logistics and Supply Chain Managers, as transportation distances and lead time has also extended many folds. Extended distances and lead time, leads to extra transportation and logistics cost, moreover it results into extra amount of greenhouses gases and fuel consumption. So this low cost production opportunity pose great challenges to academicians as well as to the managers; that how they can find a common ground, where they can integrate, align or can perform trade-off among important Lean, Resilient, Agile and Green Supply Chain Paradigms. In this paper attempt is made to find common ground, where best result can be achieved by making trade-off among critical factor for supply chain paradigms. Reduction in transportation distances, lead time and cost can provide a best opportunity for combining supply chain paradigms. This opportunity can provide a common ground or place where trade-off, alignment or even integration among important Lean, Resilient, Agile and Green Supply Chain Paradigms could be performed.

Key words: LARG, Supply Chain Paradigm, Trade off, Optimum, Alignment

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Introduction

There are number of supply chain paradigms which are found in literature as well as in practice. But interpretations of supply chain paradigms has upraised some misunderstanding among academicians and practitioners. Practitioners and researchers had been working quite hard to find the best possible Supply Chain Paradigm. Currently there are quite few paradigms in practice e.g., lean, agile, resilience, green and leagile. Largely all of these supply chain paradigms have quite few advantages as well as quite few disadvantages. If compulsorily we

have to select any one paradigm out of these paradigms, it's really a difficult selection. Because on one side we have few advantages in particular paradigm selection, but still many other benefits could have been achieved; if some other paradigm could have been chosen. So creating trade-off amongst these individual paradigms could be the best solution, we can find common ground. Thereby making room where we can align these paradigms to gain maximum advantage from these paradigms, and minimizing the disadvantages. (Arawati & Mohd Shukri, 2012) analyzed that the lean supply chain paradigm is centered on cost reduction; secondly it concentrated on continuous improvements, finally concluded that all types of wastes (operations which do not add value) should either be eliminated or reduced. It clasps all the procedures throughout the product life cycle analysis, starting from the product design to the selling, as well as from the consumer order till its delivery, (Gurumurthy & Kodali, 2008). The second paradigm is agile supply chain paradigm, which intends to build the capability to respond promptly and cost efficiently to volatile fluctuations in the markets and cumulative levels of environmental turmoil, both in the terms of variety and capacity (Agarwal, Shankar & Tiwari, 2006).). Whereas, when establishments are subject to ultimate interruptions, triggered by unanticipated and sudden occasions (like politic and financial crisis or ecological disasters), at that time the lean practices could have added to breach circumstances (Azevedo, Carvalho & Cruz-Machado, 2011).

In global bargain, with logistics crossing not only numerous countries even continents, the process from raw material handling to the final product creation, all these events (even if it is considered that they occur in a far-flung place) could create massive interruptions (Christopher & Rutherford, 2004). These interruptions are transmitted through-out the supply chains, instigating severe adverse effects in supply chains; which ultimately results into back ordering. So seemingly that which could be worthy from the competitiveness viewpoint, could lead to a catastrophe in the situation of emergency; it might also be most horrible if the organizations could not have developed enough resilience and robustness in the systems; which could recover the lost competitiveness. In the real competitive marketplace, it is essential that supply chains have more resilience to disruptive events (Ponomarov & Holcomb, 2009; McCann & Lee, 2009). Nowadays most appropriate issue in management of supply chain is the sustainability related to the environment. Greening the supply chain is the most important managerial philosophy to attain commercial earnings and objective of getting maximum market share by reducing impacts of environmental hazards; while enlightening environmental effectiveness of these organizations (Dao, Langella & Carbo, 2011; Khan,

Azfar & Chaudhary, 2011). Joining green and management of supply chain for synergetic results, the competitiveness and diversity at global scale of above mentioned two subjects cannot be ignored by any organizations.

Problem identification

Curently all supply chain paradigms, e.g., Lean, Resilient, Agile and Green (LARG) have their own critical success factors, advantages and disadvantages, which mostly are uncommon in each paradigm. Individually each paradigm's, metrics are mostly diverging and opposite to each other, performing trade-off amongst these individual paradigms could be the best solution. The problem identified is that how common ground could be found, where organisations can integrate or align important LARG Supply Chain Paradigms, for synergetic results.

Proposed Framework and Analysis

In table-1 an overview of crucial divergences and synergies amongst the LARG paradigms have been described which has been adopted from (Carvalho & Machado, 2009).

Table:1 LARG - Paradigms Synergies and Divergences Overview

Paradigms	Lean	Agile	Resilient	Green	
Supply chain attributes					
Information frequency	↑	↑	↑	-	<i>Synergies</i>
Integration level	↑	↑	↑	↑	
Production lead time	↓	↓	↓	↓	
Transportation lead time	↓	↓	↓	↓	
Capacity surplus	↓	↑	↑	↓	<i>Divergences</i>
Inventory level	↓	↓	↑	↓	
Replenishment frequency	↑	↑	↑	↓	
<u>Legend:</u> ↑ increase; ↓ decrease; - without consequence;					

Source: Adapted from (Carvalho & Cruz-Machado, 2009)

There is strong symptom that LARG paradigms supplement each other. According to the (Carvalho & Cruz-Machado, 2009), the implementation of these paradigms in the supply

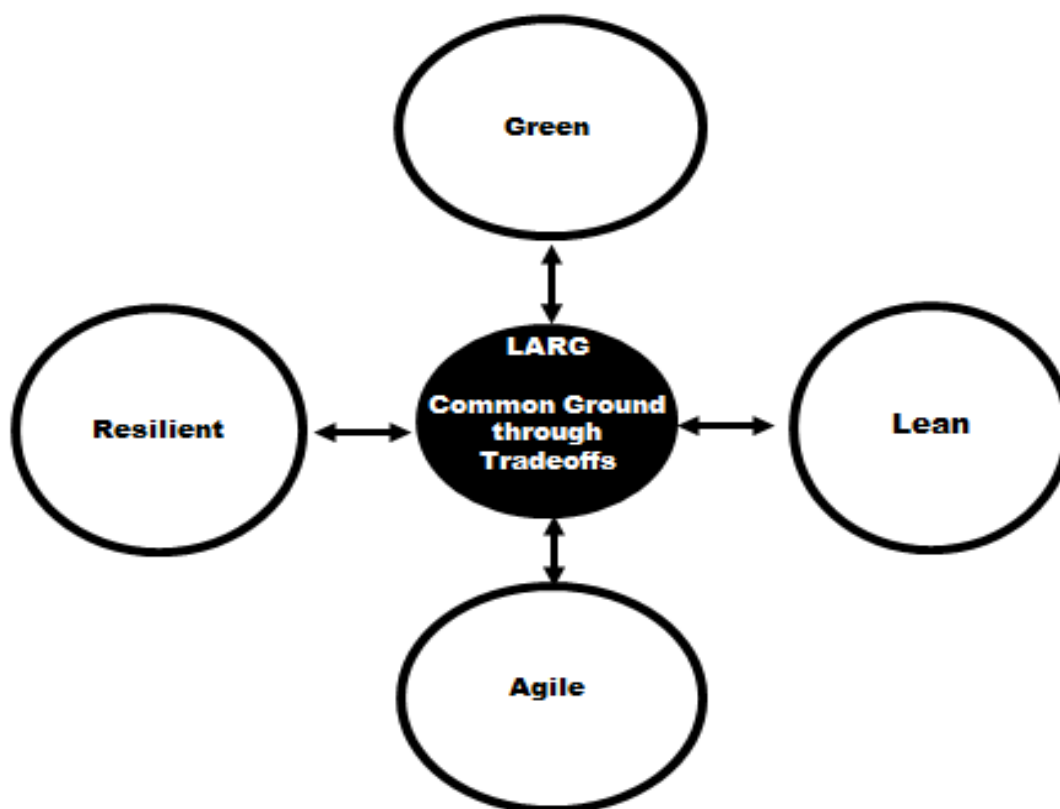
chains creates synergetic effect; which should be done in a style that definite supply chains features must be managed, e.g. level of integration, reduction of lead-time in production as well as in transportation and lastly frequencies of information. Nevertheless, the impact of each paradigm accomplishment on characteristics gauge may be altered. Lean paradigm pursues impetuously the reduction of lead-time transportation as well as production; which support reduction in total lead-time and eventually curtails total waste. Even though resilient paradigm, also acclaims that the total lead-time should be reduced (Carvalho, Azevedo & Machado, 2010; Carvalho & Cruz-Machado, 2009).

Supplies can be mass-produced with any one of the four distinct supply chain arrangements; built according to the order, assemble according to the order, design according to the order and make for the purpose of stock. Each of the supply chain patterns is appropriate for different stocks centered on its demand features. Each one supply chain arrangement orientates its industrialized and logistics techniques in an altered way focused on its deliberate significances. Practical consequences might be bulk production, with highly uncertain and lowest demand; in this case products might be coordinated with lean paradigm; while enabled by operative procedures. Where low capacity production, with highest unreliable conditions stocks must be synchronized with agile paradigm, while enabled through highly flexible measures. Medium size production and where demand is also reasonably uncertain, products must be synchronized with leagile paradigm; which should be enabled through mixture of flexible but efficient procedures. Similarly tradeoffs between Green and Lean or between Agile and Resilient could be carried out.

Nevertheless if maximum benefits has to be achieved then a common ground have to be found where tradeoff might be perform amongst LARG supply chain paradigms; which might be enabled through the tradeoffs of efficient and flexible procedures. In fig-1 on right side **Lean** supply chain paradigm is depicted whereas on opposite and left side **Resilient** supply chain paradigms, both have opposing and deviating practices. In first lean supply chain paradigm scenario industry would tend to have nil inventories, while in the case of resilient supply chain paradigm scenario industrial supply chain manager would love to have adequate stock to recuperate its initial position from interruption triggered by any calamity. Similarly in Fig-1 on top **Green** supply chain paradigm is depicted whereas on opposite and bottom side **Agile** supply chain paradigm is depicted, once again both supply chain paradigms have opposing and deviating practices. In green supply chain paradigm scenario industrial supply chain manager would love to have minimum number of transportation trips but maximum

number of inventories must be loaded on vehicles. While agile supply chain paradigm scenario dictates that industrial supply chain manager could have as many trips as required for the purpose flexibility, but response should be very quick and agile. Now it's quite obvious that all paradigms have opposing and deviating requirements and practices. If industrial supply chain manager wants to be on safer side and wants to grab optimum benefit from these LARG paradigms, he needs to perform a tradeoff and must found certain common ground, where these paradigms could be aligned, this common ground could provide a platform where through synergetic results could be achieved. So this common ground could be acquired by performing tradeoff among LARG supply chain Paradigms. The elements which contribute to achieve synergetic results are level of integration, reduction of lead-time in production as well as in transportation and lastly frequencies of information. If supply chain manager could reduce distances of transportation and most importantly transportation lead time; this should have a maximum and positive influence on each paradigm.

Fig. 1: Common Ground through tradeoff among LARG – Supply Chain Paradigms



Conclusion

To find a common ground among existing supply chain paradigms, a tradeoff needs to be performed. This tradeoff could be performed through reducing the transportation distances, transportation lead time and production lead time as well as enhancing the level of integration and frequencies of information. This tradeoff among LARG paradigms provides supply chain managers that common ground, where they can align existing supply chain paradigms for synergetic results. The common ground found through tradeoff could be exploited further; supply chain managers can plan their strategy, while capitalizing the advantages of LARG supply chain paradigms. While poisoning in central place give supply chain managers added advantage, where they can change their position by putting weight in either side, keeping in view the changing market demand and supply position. This common ground provides them ideal location to be highly lean, agile resilient as well as green at a time, where they can change strategy and could move in either direction to adopt any one paradigm if situation changes very rapidly. Its enable supply chain managers to be highly dynamic in planning and adopting common ground, where if situation changes dramatically they can switch over to any one particular supply chain paradigms according to the situation. This common ground makes supply chain more lean, agile, resilient and green ever before, whereas planning is very flexible and dynamic. Still there is room to fall back to common ground after the situation is under control after any disruption, to take maximum advantages of all individual paradigms.

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