Book Review: Supply Chain Management from Concepts to Practice

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Abstract – This book represents a business case study which is conducted to answer the research question: "How can the agility best fit within the supply chain strategies?" this business case study is applied on Delta Electrical Appliances (DEA) Company, a member of "Olympic Group", the Egyptian market leader of home appliances. This research contributes to literature by developing the DESC (Differentiated Enlightened Supply Chains) framework that consolidates three analyses to pave the road for differentiated supply chain management through which every different supply chain is managed differently to serve for different order winning criteria which are considered from multiple perspectives. Also, this framework assesses the current status of DEA supply chain processes through four representations in order to discover the scope and priorities of the supply chain from multiple perspectives. Then, DESC framework measures DEA process performance in respect to the set priorities, and benchmark the performance against the competitors and best in class performance. Third phase of this framework develops the guided performance in optimizing the planning performance for finished products and raw materials.

Keywords: *Supply chain management; Supply chain strategies; agile supply chain; Lean supply chain; Decoupling point; DESC (Differentiated Enlightened Supply Chains) framework.*

1. Introduction

The purpose of this research is to track the use of differentiation and optimization of supply chains as survival needs to firms. The increasing dynamics and complexity of today's supply chains resulted into the need to select from a wide variety of developed approaches to manage their supply chains. Some are lean, agile, Supply Chain Operations Reference model (SCOR®) framework and many other detailed models and methodologies.

In this research a business case study is conducted to answer the research question: "*How can the agility best fit within the supply chain strategies?*" This business case study is applied on Delta Electrical Appliances (DEA) Company, a member of "Olympic Group", the Egyptian market leader of home appliances.

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It was concluded that in such significant and rapid changes in the requirements of different products and markets, differentiation is the clue to satisfy customer requirements and firms' competitive position. *It is to manage different priorities differently*. Also, the research concluded that Postponement strategy is highly recommended for firms in competitive environments with high market dynamics. The research pointed out that in order to avoid misleading results, data must be refined before the analysis starts. This requires three main actions. The first is to "*Run the analysis ONLY on active products, i.e. remove the discontinued products*". The second is to "*Disregard the periods affected by exogenous factors if they have a medium to long term effects*". The third is to "*Neutralize the market fill quantities in the analysis*".

This research contributes to literature by developing the DESC (*Differentiated enlightened Supply Chains*) framework that consolidates three analyses to pave the road for differentiated supply chains management through which, every different supply chain is managed differently to serve for different order winning criteria those are considered from multiple perspectives. Also, this framework assesses the current status of DEA supply chain processes through four representations in order to discover the scope and priorities of the supply chain from multiple perspectives. Then, DESC framework measures DEA process performance in respect to the set priorities, and benchmarks the performance against the competitors and best in class performance.

Third phase of this framework develops the guided performance in optimizing the planning process for finished products and raw materials.

2. Literature Review

The idea of manufacturing flexibility was extended into the wider business context and the concept of agility as an organizational orientation was born by Nagal and Dove (1991). Later, Christopher and Towill (2000b) confirmed the argument that "A key characteristic of an agile organization is flexibility".

Venkatraman and Henderson (1998) represented three elements of *virtual organizing* as an assessment of the agile capabilities of a supply chain. Christopher (2000) characterized the agile supply chain by possession of four distinguishing characteristics. The first; the agile supply chain is *market sensitive* to quickly respond to customer requirements. The second; it is information based through *virtual supply chain* - rather than inventory based - which

assumes access to information, knowledge and competencies of companies through the Internet. The third; it has *process integration* that allows collaborative working between buyers and suppliers. Finally; it is *network based* in a way that leverages the respective strengths and competencies of network partners to achieve greater responsiveness to market needs. Similarly, Hoek et al (2001) identified four dimensions of agile supply chain practices. The first is *customer sensitivity*. The second is the *network integration* between all nodes in the chain. The third is *process integration* so that core modules of products can be delegated within networks of agile competitors. Finally, the fourth element is *virtual integration*.

The use of information technology to share data between buyers and suppliers is, in effect, creating a *virtual supply chain*. Virtual supply chains are information and inventory based supply chains rather than the classical only inventory based supply chains. Electronic Data Interchange (EDI) and the Internet have enabled partners in the supply chain to act upon the same data i.e. real demand, rather than be dependent upon the distorted and noisy picture that emerges when orders are transmitted from one step to another in an extended chain.

Hoek et al (2001) identified four dimensions of agile supply chain practices. Figure 2 models these four elements. *Customer sensitivity* means that collaborative initiatives should be driven by quick response to customer requirements. In this respect, manufacturing processes require integration and specialization based on relative areas of excellence in core competencies. *Network integration* requires that companies in the chain have a common identity, which can range from commitment to agile practices, compatibility of structure, information architecture and tradable competencies. The third element is *process integration* and interdependence so that core modules of products can be delegated within networks of agile competitors. The fourth element; *virtual integration* assumes access to information, knowledge and competencies of companies through the Internet.

Closely related to the characteristics of the agile supply chain, critical factors that determine and influence an organization's supply chain agility were identified and developed by Ghatari et al (2009) through exploratory driven study that defines the dimension of process based supply chain agility.

Venkatraman and Henderson (1998) assessed the supply chain agility and capability by its stage attained on three inter-dependent dimensions of supply chain maturity. This assessment is based on the stage attained on three inter-dependent dimensions of supply chain maturity.

Many researchers and business practitioners may see a conflict between lean and agility. Some researchers made a distinction between lean and agile approaches. Mason-Jones *et al*. (2000) made a distinction between lean and agile approaches as a selected strategy for building market winners (MW) or market qualifiers (MQ).

Organizations that created agility in their supply chain enjoy many benefits such as shorter lead time and meeting customers' requirements (Christopher, 2000). Agility has become more critical in the past few years because most supply chains are incapable of coping with emergencies that have become frequent like the terrorist attack in New York in 2001, the dockworkers' strike in California in 2002, and the SARS epidemic in Asian 2003, threat from natural disasters, terrorism, wars, epidemics, and computer viruses. Without a doubt, agile supply chains recover quickly from sudden setbacks (Lee, 2004).

One of the major strategies to create agility is the postponement strategy through the decoupling point. Yang and Burns (2002) introduced a framework of postponed manufacturing and its impact on global competitive performance. Closely related to how to create agile supply chain is how to marry the lean and agile paradigms. Aitken al, (2002) concluded that lean precedes agile. This is because real and effective change requires the mapping and understanding of all the relevant business processes in the value chain from customer need identified to customer need satisfied.

The point at which real demand penetrates upstream in a supply chain maybe termed the decoupling point. Previously, this idea has been termed the 'order penetration' point (Baker, 2008). Decoupling Point is the point at which market "pull" meets upstream "push". It separates that part of the supply chain geared towards directly satisfying customers' orders from that part of the supply chain based on planning (*Source: M&DC Knowledge Portal, last access Mar. 2011*). The aim of the agile supply chain should beto carry inventory in a generic form – that is, standard semi-finished products awaiting final assembly. This is the concept of 'postponement'.

3. Research Statement

As there are many strategies for supply chain management, in this research business case study is conducted to answer the research question of "***How Can the Agility Best Fit within the Supply Chains strategies?***" As the business case study is applied on Olympic Group, this research focuses on the field of home appliances while answering the research question.

4. Methodology

The used methodology in this research is to answer its research question is Case study. Qualitative case study methodology provides tools for researchers to study and explore complex phenomena within their contexts using a variety of data sources.

5. Discussion and Results

Implementation of this case revealed positive results in exploring the improvement opportunities of DEA and achieved significant performance improvement of the following:

- Defining key success factors and business priorities

- Readiness for benchmarking performance and setting targets
- 13% Savings in purchasing cost of Raw materials and components.
- 17% Reduction in days of on hand inventory from 120 to 100.
- 4% Reduction in working capital by EGP 16M due to categorized safety stock policy.
- Increase in product availability from 98% to 99.5%.
- Increase in Suppliers schedule adherence from 91% to 97%.

The most significant results of this research was its contribution to literature by developing the DESC (Differentiated Enlightened Supply Chains) framework - illustrated in figure 19 - that consolidates three kinds of analyses on DEA's historical sales volumes to differentiate DEA supply chains. The first is Runners/Repeaters/Strangers (RRS) analysis. The second is Product life cycle (PLC) analysis. The third is Duration of lifecycle; time Window for delivery, Volume, Variety and Variability (DWV3) analysis for each product.

This paves the road for differentiated supply chains management through which, every different supply chain is managed differently to serve for different order winning criteria those are considered from multiple perspectives. Then this framework links DEA processes to their related SCOR Key Performance Indicators (KPI's) to define the critical success factors for DEA. All of these kinds of analyses are consolidated in one matrix to illustrate the differentiated supply chains strategies bases on different order winning criteria for each of DE products.

Also, this framework assesses the current status of DEA supply chain processes through four representations in order to discover the scope and priorities of the supply chain from multiple perspectives. They are the Business scope diagram, the SC definition matrix, the "As IS" Input/output tables, and the Work flow swim lanes. Then, measures DEA process performance in respect to the set priorities, and benchmarks the performance against the competitors and best in class performance.

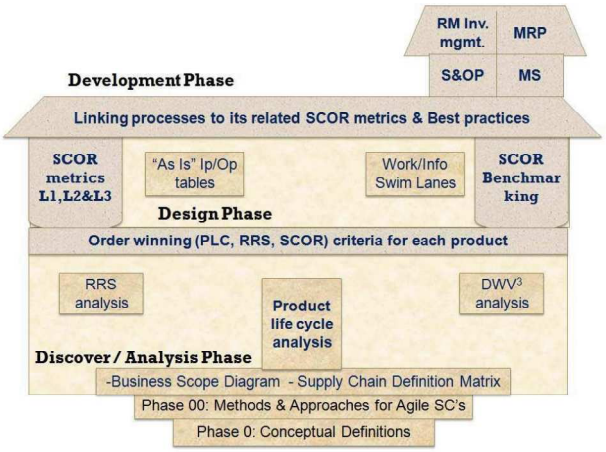

Figure 1: DESC framework (developed by the book author)

Third phase of this framework develops the guided performance in optimizing the planning process for finished products and raw materials.

The applied Raw Material inventory analyses (*X-Y-Z* Inventory value *analysis* of, *A-B-C* Consumption *analysis* of Raw Material and *lead time analysis*) revealed the company has high value items (X) in its lowest consumption items (C). This indicates that DEA Company holds significant obsolete stock value. A recommendation was given to DEA Company to write off its obsolete stocks to improve its financial performance. Also, this work recommended inventory decisions for DEA like where to use Kanban, vendor Managed Inventory (VMI) or MRP systems based on each group position in this *X-Y-Z*, the *A-B-C* and *lead time* matrixes.

Applied finished products safety stock at DEA was neither fixed static level nor ratio of past actual sales volume. Rather it is a ratio of the demand in ascertain coverage period of the sales forecast. This complies with the essence of keeping safety stock to protect against the uncertainty of demand (and/or supply) of the future period. SS is calculated by the required consumption for a certain number of days into the period ahead.

The number of days is determined according to the RRS categories of the finished product. This method adjusts for demand seasonality of white goods.

6. Conclusion

The research concluded that in such significant and rapid changes in the requirements of different products and markets, "Differentiation" is the clue to satisfy customer requirements and firms' competitive position. It is to differently manage different priorities. There is neither lean nor agile company. Rather, every different supply chain needs to be differently managed according to its current order winning criterion. Also, it concluded that "Postponement" strategy is highly recommended for firms in competitive environment with high market dynamics.

'Agile' and 'Lean' are yet recent approaches; mostly immature in the mind of many decision makers, accordingly, many companies may select one of them as organization or business unit strategy, or even companies may select the hybrid 'League' strategy to be deployed over the whole product. This would not be a wise decision because it did not consider the different nature of products and even more, the stage of the product life cycle itself. We keep differentiation into our mind sets, it is not about one supply chain for the business unit, and rather it is many supply chains with different order winner criteria preach.

The distinction or integration between *lean* and *agility* presented a wide debate area. At the early stages of searching this topic, there has been a tendency to suggest that these approaches are mutually exclusive and represent conflicting paradigms as a selected strategy for building market winners (MW) or market qualifiers (MQ). Later to this idea, researchers looked at the two approaches as they

can be used separately or conjointly, according to the demands of the market-place and the characteristics of the physical product (e.g. design, supply constraints, etc.), they concluded that we may well find the lean and agile paradigms operating at different times but in the same place, or operating at the same time in different places within a supply chain.

Recently, many researchers concluded that the two approaches can complement each other, and in many cases there is a requirement for a "hybrid" lean/agile strategy to be adopted by marrying the two paradigms to get the advantages of both of them. One of the most effective strategies to create agility is the postponement strategy through the decoupling point.

The aim of the agile supply chain should be to carry inventory in a generic form – that is, standard semi-finished products awaiting final assembly or customization and will not take place until the final market destination and/or customer requirement is known. This strategy benefits in:

- Fewer stock-keeping variants and hence less inventory in total.
- Greater flexibility in fulfilling the market demand.
- Easier forecasting process at the generic level than at the level of the finished item.
- Allowing for *mass-customization.*

Deploying the postponement strategy avails being agile while getting the benefits the lean cost efficiency.

Analyses should never be built on crude results without refining. Especially that there no true meaning for any measurement or analysis unless if it guides for decision making or corrective action. This research highlighted that in order to avoid misleading results; data must be refined before running the analyses. The marketplace order winners (OWs) and order qualifiers (OQs) are dynamic for any specific product as it proceeds through its product lifecycle. Therefore, the production and manufacturing processes must also dynamically adapt to best service these changing marketplace conditions. The basic elements of a supply chain are then re-configured to better match the marketplace.

Reference

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