Green Supply Chain Implementation: Best Practices and Challenges

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Abstract
In recent years, climate changes such as global warming have been a topic that has attracted a lot of interest world over. Such changes have necessitated the need to identify the causes and solutions to these climatic changes. In an effort to mitigate these changes, legislations and environmental requirements have been put forward by governments and environmental agencies. The demand for environmentally friendly products has increased over the years and so is the shifting of loyalty of consumers. Also, the ever increasing costs of energy and inputs has forced business to find new ways to reduce energy use in order to reduce costs.
The supply chain has been identified to have a significant impact on the natural environment. As a result, businesses are deeply trying to green their supply chain by introducing green strategies in their organizations and in the supply chain. This has resulted in a growing need for integrating environmentally thinking into supply chain management and processes. It is in light of this realization that this paper tries, through a thorough literature review, to find the best practices that can be applied in green supply chain strategies.
For this reason, four best approaches were identified; Aligning the goals of the green supply chain with the goals of the business, evaluating the supply chain as a single life cycle system, innovation using green supply chain analysis, reducing waste at each supply chain stage. It was also identified that Lack of appropriate technology in place to support companies and their efforts to go green and the Trade-off between green requirements and lean practices among other factors act as challenges to green efforts.

Key words; Green Supply Chain, Implementation, Best Practices and Challenges
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1.0 INTRODUCTION

In the last few years organizations have found themselves under pressure to green their supply chain. This pressure comes from customers, regulators and competitive and strategic obligations and suppliers. As the increasing cost of energy and raw materials has forced businesses to find new ways to reduce their energy use in order to reduce cost and remain competitive in the market. This has made Green supply chain management an important strategic tool.

Organizations’ operations or activities have been known to have an impact within the environments in which they operate. Bloemhof-Ruward, et al., (1995) argues that the wastes and emissions caused by the supply chain have become the main source of current environmental problems. It is due to this realization that Governments, regulators in effort to conserve the environment have passed regulations aimed at controlling the effect of businesses activities on the environment.

Despite the large number of businesses that understand the importance of GSCM, the number of firms that actually engage in such practices is significantly lower (Wilkerson, 2003) this because many procurement professionals and their organizations are still unaware, uncertain or struggling to find the best way to approach it. This paper will try to identify the best practices to be applied when implementing green supply chain.

2.0 DEFINING GREEN SUPPLY CHAIN MANAGEMENT

Green supply chain is fairly new concept. It is based on two concepts; the supply chain management concept and the environmental management concept. Lamming and Hampson (1996) explored these two concepts and liked them together. Green Supply Chain Management merges these two concepts together. Green supply chain management has variously is defined as “the purchasing function’s involvement in activities that include reduction, recycling, reuse and the substitution of materials.”
(Narasimhan and Carter, 1998), “the practice of monitoring and improving environmental performance in the supply chain” (Godfrey, 1998), “the way in which innovations in supply chain management and purchasing may be considered in the context of the environment” (Green et al., 1996 188). Green supply chain management is thus the integration of environmental management into supply chain management.

Figure 1: Green Supply Chain Management


Green supply chain management will aim at confining the wastes within the supply chain system in order to conserve energy and prevent the release of dangerous materials into the environment.

3.0 GREEN SUPPLY CHAIN IMPLEMENTATION BEST PRACTICES

A number of approaches for implementing GSCM practice have been proposed in previous literature (Hsu and Hu, 2008). Wilkerson (2005) identified four green supply chain implementation best practices; align green supply chain goals with business goals, evaluate the supply chain as a single life cycle system, use green supply chain analysis as a catalyst for innovation, focus on source reduction to reduce waste.

3.1 Align green supply chain goals with business goals

Most businesses usually define green supply chain goals and business goals separately. This may lead to businesses defining supply chain goals without a true understanding of the business case and value propositions behind such goals in
addition to leading to confusing or conflicting communications to the organization where goals may be contradictory. For example a business goal may be to use eco-friendly packaging that cost more than the traditional packaging which goes against the business goal of reducing cost. This does not support the infusion of green supply chain goals into business goals (Happek, 2005).

A supply chain goal should always support the attainment of the business goals. A company should therefore look at its overall business goals and identify how a transition to a green supply chain can help achieve those goals. For example if a company wants to reduce its energy costs it should start by evaluating its energy consumption to establish whether a reduction can be made by using energy efficient and environmentally friendly equipments. (Mazumder, 2010)

3.2 Evaluate the supply chain as a single life cycle system

A typical supply chain has a number of different business process all linked together to form a network, with one process leading to another forming a system. System thinking looks at the supply chain as being composed of activities that have outputs serving as inputs to other activities and thus providing a means of understanding systems at a deeper level in order to see the paths available to bring about changes more effectively. (Prugsamatz, 2010)

Figure 1: Environmental life cycle

A life cycle system allows a holistic view of the supply chain from raw material extraction to final disposal of materials. This ensures full visibility across the entire supply chain and an understanding of the end-to-end impact of green supply chain management programs. In this way, it becomes easier to identify opportunities for the program to deliver business value such as lower costs or improved competitive advantage (GSC, 2011).

3.3 Use green supply chain analysis as a catalyst for innovation

Green supply chain analysis provides an opportunity to review processes, materials, and operational concepts. It targets wasted material, wasted energy or effort and under-utilized resources (Wilkerson, 2005). Chatterjee, Mazumder (2010) and Murrey (2011) observe that businesses that want to make a transition to a greener supply chain should review all their business processes to identify areas where adopting a greener outlook can actually improve their business.

Figure 3: Green Process Improvement Approach

Since pollution and waste represent incomplete, ineffective, or inefficient use of resources, businesses should review each process along the supply chain to identify the sources then see if a more environmentally sound approach will drive waste
from the supply chain processes. This will ensure continuous improvement in all your supply chain operations (GSC, 2011).

3.4 **Focus on source reduction to reduce waste**

The recycle and re-use waste management programs focuses on management of waste after it has been created. On the other hand Source Reduction focuses on the prevention or the reduction of wastage during production rather than managing it after it has been generated with the aim of efficiently utilizing resources by examining how business is conducted, how materials are used, and what products are purchased.

**Figure 2: Source Reduction**

Source: Serkis (1999); Wilkerson (2005)

Source reduction can be achieve measure such as; using reusable instead of disposable materials, eliminating certain items, repair and maintenance of equipments, using durable products, using recycled products (Cohen, 2005).

4.0 **CHALLENGES IN IMPLEMENTING GREEN SUPPLY CHAIN MANAGEMENT**

Green supply chain management like any other business investment is without challenges, especially since is new to many businesses. Business need to overcome these challenges in order to their green efforts to become a reality. The Ryder Center for Supply Chain Management (2008) identifies three main challenges facing companies while trying to green their supply chain; (a) lack of appropriate
technology in place to support companies and their efforts to go green, (b) business processes needed to capture the appropriate data in the supply chain and therefore make great use of their existing technology and (c) the trade-off between green requirements and lean practices.

4.1 Lack of appropriate technology and business processes needed

Technology provides energy efficient solutions that have a more favorable impact on the environment. Information technology can make the supply chain greener by optimizing the resources required to support the business and also enable more effective supply chain planning, execution and collaboration, thereby reducing resource requirements (Cognizant, 2008). Green supply chain technologies cannot work independent of the business processes in the supply chain. Both the green supply chain and the supply chain are a complement of one another. A supply chain technology cannot work without which is provided by the business process. There is need therefore to have a process that captures such data.

4.2 Trade-off between green requirements and lean practices

Lean and green strategies are often seen as compatible because of their shared focus on waste reduction. Leanness stresses on reduced amount of inventory to go through the supply chain which minimizes the negative environmental impact of the supply chain. However, lean strategies that employ just-in-time (JIT) delivery of small batch sizes which improves sufficiency can require increased transportation, packaging, and handling which increase emissions contradicting the green approach (Mollenkopf, Stolze, Tate and Ueltschy, 2010).

Outsourcing also may involve parts of the manufacturing process being transferred to plants on the other side of the world, only for the products to be transported back
for the next part of the supply chain process which requires additional transportation and thus increasing emissions (Simchi-Levi, 2008)

4.3 Failure to integrate supply chain optimization efforts with green supply chain efforts

Cash and Wilkerson (2003) argue that most firms implementing green supply chain practices do not actually integrated environmental considerations into their supply chain management processes. Their approach is usually driven by a need to green an existing process or a piece of the chain. Although this may have a positive impact on the environment, the environmental aspects are frequently not considered when those responsible for reviewing a business’s overall supply chain performance make changes in the supply chain. They further argue that it is only after changes in the supply chain have been implemented and their effects on the environment revealed that the idea of greening the supply chain has the opportunity to emerge.

5.0 CONCLUSION

For green supply chain implementation to be successful and sustainable; transparency collaboration and integration of systems between trading partners in the supply chain is required, senior management support is a must because not only will the senior management play an important function in influencing the business’s attitude towards green initiative, they can also dedicate resources in terms of time, personnel and finances towards such initiatives. Green supply chain should closely align to customer needs which will give the supply chain on the green product design that is required of them by the customer.
6.0 REFERENCES


Cognizant (2008), “Creating a Green Supply Chain Information Technology as an Enabler for a Green Supply Chain”.


