

Article

Green Supply Chain Management: A State of the Art Literature

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A B S T R A C T

Green Supply Chain Management is defined as “the process of making use of environment-friendly inputs and transforming these inputs into outputs that can be disciplined, collected, selected and re-used at the end of their life cycle analysis thus, creating a sustainable and provision of carry chain. GSCM is one of the most recent innovations for the upgrading and advancements of capabilities of Supply Chain Management. The main aim of approaching towards this topic of this paper is to briefly and very abstractly examining and determining the text of the Green Supply Chain Management (GSCM) over the last three decades. The principle behaviour that came out of the texts are: Green operations, Green designs, Green manufacturing, Reverse logistics and Waste management. This paper also discusses the key drivers for green initiatives include government fulfilment, better user and general relations and project efficiency.

Keywords: Green Supply Chain, Sustainable Development Green Purchasing, Green Design, Reverse Logistics, Green Manufacturing, Green Packaging

Introduction

As the community becomes more attentive of environmental issues and global warming, consumers will be asking more questions about the goods they are purchasing. Organizations will have to look forward to questions about how green their automatic methods and supply chain are, their carbon footprint and how they are recycled.¹⁻⁴

Sustainable expansion has made notable advancement in establishing environmental and social sustainability towards action management and the supply chain. Sustainable development means “progress that meets the needs and requirements of the present without finding the middle ground of the ability of future generations” Sustainability covers three aspects: monetary, ecological and social job. Green Supply Chain Management (GSCM) is about making the entire supply chain more environmental sustainable.

Companies may choose to take on GSCM for many various reasons: one may be implemented due to laws, rules and regulations, one may use GSCM to differentiate oneself in a competitive industry by being environment friendly and last but not the least, one might need to apply GSCM to be competitive if your competitors already have adapted GSCM. With rising customer watchfulness and regulatory norms, associations with greener supply chain management practices will have aggressive gain over companies that are not willing to accept GSCM. Hence crossways industry there is shifting the centre of GSCM creating value for customers and stakeholders. Examples like:

- Dell saves over \$20mn annually because of supply chain and packaging improvements. In fact, this market leader achieves its goal of becoming carbon neutral by 2008
- Pepsi-Cola saved \$44mn by switching from corrugated

to reusable plastic shipping containers for one litre and 20 ounce bottles, conserving 196 mn pounds of ribbed material⁵

Scope of GSCM

GSCM scope ranges from implementing and monitoring of the general environment management programs to more creating or controlling practices implemented through various Rs (Reduce, Re-use, Rework, Refurbish, Reclaim, Recycle, Remanufacture, Reverse logistics, etc.) towards attaining a GSCM waste reduction is being thought of as an important strategic. The waste, which is non-value adding activity, carried out in any operation. The most commonly perceived enemy to environmental protection in manufacturing and production operations. That is, manufacturing and production processes are viewed as the culprits in harming the environment, in the forms of waste generation, ecosystem disruption, depletion of natural resources.²

Key Themes of GSCM Literature

Green Purchasing

GP is defined as an biologically conscious purchasing initiative that tries to ensure that purchased products or materials meet environmental objectives set by the purchasing firm, such as reducing the sources of wastage, promoting recycling, reuse, resource reduction and substitution of materials.^{1,2} GP ensures that purchasing or supply chain managers consider the issue of sustainability in the purchasing of inputs, in accumulation to the traditional purchasing criteria of cost, quality and delivery.³

Green Design

It is about designing a good or a service that promotes environmental awareness. Fiksel (1996) argues that organisations have definite potential to become eco-friendly towards product/ good and service re-manufacturing. Large scale industries that have complex supply chains should consider and focus on the perks of Reverse Logistics (RL). Designers, mostly concerned with performance of the product, must consider the effect of design details on all the energy and material requirements for manufacturing, use and secondary use (reparability, manufacturability and recyclability). Re-manufactured goods will only be helpful and accommodating if they are able to make available at least the services of the products they trade. By covering the useful life of equipment items, additional raw materials are not needed to produce new items. Design and develop recoverable products, which are theoretically tough and hard-wearing, frequently exploitable, undamagingly recoverable after use and environmentally well-suited in disposal.⁴

Life Cycle Analysis

Life-cycle analysis is an important subordinate perception

to Green Design. Life-cycle analysis was introduced to determine ecological and supply related products to the creation process (Srivastava, 2007). This measurement constitutes of stages from withdrawal of raw materials, construction, allotment and re manufacturing, recycling and final clearance and remarks that life cycle analysis "examines and quantifies the energy and materials utilized and squandered and assesses the impact of the product on the environment." Government policy and regulations are also an added factor for industries to work in favour of life-cycle analysis.⁵⁻⁹

Reverse Logistics

Reverse logistics activities are different from those of traditional logistics (Carter and Ell ram 1998). Reverse logistics network connections have some generic individuality related to the harmonization requirement of two markets, bring in uncertainty, returns character decisions, rearrangement and assumption.⁵ In this paper approach towards reverse logistics as a procedure where a manufacturer recognizes formerly transported manufactured goods from the point for utilization for potential recovering and re-manufacturing.⁶ This paper state that reverse logistics have been widely used and accepted in automobile industries such as BMW and General Motors. Collected work is the first stage in the recuperation process. Products are chosen, unruffled, transformed and sent to facilities fore manufacturing.

Green Manufacturing

This is a very crucial area within green computations. The procedure for minimum energy and resource spending for flow schemes in order to reduce the use of virgin materials are based on three fields of study: squeeze analysis industrial energy and power and life cycle analysis. The misusing of materials and energy either due to unfortunate blueprint, or due to excessive, large and repeated number of imperfections should be neglected. Intel has worked in amplified number of transistors in a single chip, which will affect in fewer and lesser chips to build and lesser chips to dispose. Using less energy is obviously and conveniently good for the environment. It is also unmistakably good for trade because it cuts companies' costs and finally avoids probable environmental accountabilities. The recognition of where immense quantity of energy are used could consequently lead to redesigning of the good/ service or its use to make major energy diminution. Huge developments in energy competence can frequently be attained at petite or no cost at all, even with net savings, through the exercise of objective and targeted agenda.

Green Packing

Packaging design is significant and vital for acquiring a company's environmental goals objectively. Though it provides a definite want related mainly to the division of the

product, it is not an element of the authentic examination offered by the product. In any matter, it has an effect on environment in many aspects. The following ethics may apply with reference to wrapping or packaging. Bound packaging to the needed size and devise packaging for refilling or recycling and make use of unvarying packaging when applicable. In re-organizing the packaging regulation, Xerox changed its packaging and found packaging reuse centers in the UK, the Netherlands and the US. In accumulation, it reduced the quantity of internal packaging to decrease waste.^{10,11}

Conclusion

GSCM can reduce the ecological impact of industrial activity without sacrificing quality, cost, reliability, performance or energy utilization efficiency. GSCM throws various challenges to practitioners, academicians and researchers. The intention of this paper is to temporarily provide an overview which envisages the of the Green supply chain literature. This paper has specified that GSCM has helped to reduce the ecological impacts of industrial activity. Key academics have argued different angles to GSCM. Some works had been discussed about reverse logistics¹⁻⁴, whereas⁵⁻⁷ other works discussed life-cycle analysis. But the key themes that came out of the GSCM literature over the last twenty years are the concepts of green design, green operations, reverse logistics, waste management and green manufacturing. A great deal research, management education and many practical applications have focused on buffering the operations function from external influence, including the natural environment, to improve efficiencies, reduce cost and increase quality. The inherent complexity of environmental issues their multiple stakeholders, uncertain implications for effectiveness, efficiency and international importance present crucial challenges to researchers. Huge research is required to support the evolution and growth in business practice towards greening along with the entire supply chain. Effective approaches for data sharing across the chain of supply needs to be developed and integrated.¹²⁻¹⁶

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