

## Chapter 3

# Improving the Supply Chain (SC) Stream with Green Product Design (GPD) Strategy: Green Supply Chain Management (GSCM)

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### ABSTRACT

*The current Supply Chain (SC) is under change. The traditional way to generate a product contained the following stages: product design, raw material selection, material transportation, manufacturability, distribution and disposition at end of life. Product design for instance, is considered an extremely important stage of a product, being that, it directs the way the product can potentially be managed along the SC. It defines the raw material to be used, the possible supplier to select, the industrial processes involved in its fabrication, the packaging for its transportation and the newest stage where the product reaches its end of life and needs to be disposed. The Product design then becomes Green Product Design (GPD), where energy, time, resources become critical for a company. GPD takes into account the whole product life cycle. This chapter presents the importance of having a GPD process into the SC, the way to incorporate it, and the benefits of implementing it into the SC.*

### INTRODUCTION

With the development of economic and the progress the industry of products conflicts arise between these two main drivers. The company's economic gain faces the challenge to reduce energy consumption and environmental resource care. Today consumers have become more aware of environmental care and seek for products that are manufactured following green practices. Therefore, companies are motivated

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to invest in strategies that will help address these highly changing needs and establish a competitive advantage among competitors.

Supply chain (SC) is a methodology that aims to achieve organizational goals, some authors are considering it as the new strategy for proficiency in this globalized world (Elgazzar, Tipi, & Hubbard, 2012; Ngai, Chau, & Chan, 2011) and supply chain management (SCM) is the group of activities that aims to plan, integrate and control those activities as a strategy. Nevertheless, with the increasing world-wide awareness of environmental care, a green production has become an important metric for almost every manufacturer, so the SCM is turning into green supply chain management (Lee, 2009; Mark & Anton, 2014).

A more sustainable supply chain performance is indicated by a company's capacity to reduce the use of materials, energy or water and to find solutions that are more eco-efficient by improving the management of their supply chains (Ortas, Moneva &, Alvarez, 2014).

The general idea is that the use of green operational practices reduces energy consumption and waste, consequently producing higher revenues. Among these practices, Green product design (GPD) is one of the main themes in the literature on environmental management (Albino, Balice & Dangelico, 2009).

The introduction of GPD is undoubtedly one of the new trends in industry as significantly influences the cost of manufacturing a product throughout the SC. The main goal of GPD is the reduction of environmental impacts in each stage of any product's life cycle and in parallel will bring benefits for the company like: reduction of energy consumption, less waste disposal, less resources consumption, improved social and corporate image and therefore more revenue. Therefore, the purpose of chapter is to provide an input regarding the importance that GSCM via GPD brings to any company's SC.

The chapter is organized as follows: Section 1 Introduction, 2 incorporates a description of Supply Chain, Supply Chain Management and examples of application and success, Section 3 presents the description of Green Supply Chain Management and overview of the components, examples of applicability and success and the potential competencies, Section 4 describes Green Product Design, its practices, benefits, and process and a way to implement into a SC, closing with Section 5 Conclusions and remarks.

## **Supply Chain (SC)**

The SC is the sequence of events that cover the entire lifecycle of a product or service from beginning (raw material distribution) to end (final customer use) according to Blanchard (2010). Therefore, SC includes all of the tasks involved directly or indirectly in fulfilling a customer's need.

The SC can be extremely complex as it integrates independent organizations that work together to develop, control and manage a product (Wu, Chen & Hsieh, 2012). The integration of independent companies lead for SC to become an important element in current global economy, SC is the new strategy for competence (Ngai et al., 2011).

The supply chain is integrated by three main components (Villanueva-Ponce, Romero-González & Alor-Hernández, 2014)

- Supplier (raw material)
- Manufacturer (product)
- Distributor (to end user)

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