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Green supply chains: Efforts and potential applications for the Turkish market

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ABSTRACT

This study aims to explore the suitability and significance of waste management as the first step to creating green supply chains in general, and as an extension of this exploration we address the following research questions:

(1) What should be the starting point both for individual companies and supply chains for becoming green? Can it be waste management?
(2) What is the level of environmental consciousness of firms and how is it possible to assess the potential level of participation if a waste management system was to be implemented in their supply chains?
(3) Which sector would be the most appropriate for implementing a green policy in terms of attracting the attention of other sectors and customers simultaneously?
(4) What are the dynamics of interdependency and interaction within the upstream and downstream partners in the chain in terms of green consciousness?

In discussing green issues, the importance of the mentioned "attracting attention" underlies the importance of consciousness. Addressing this issue requires a general understanding of the current situation in the Turkish market in the first place, and then to extending this understanding to be able to evaluate more effectively the potential of waste management to help companies and consumers gain consciousness at the same time. Based on the literature and personal experience, it was decided to select the electrical and electronic equipment (EEE) sector for research. The focus group method was selected to collect opinions of managers from the EEE sector in Izmir. The focus group study was implemented in two sessions. Results showed that the waste management implementation could provide a good starting point for introducing green supply chains, and that the EEE sector could serve as a model for other sectors and consumers, as this sector's products directly affect electricity consumption. Also, we propose a conceptual model regarding dynamics of interdependency and interaction within the upstream and downstream partners in the chain in terms of green consciousness. The key contribution of this study is an analysis of the dynamics between upstream and downstream members in the supply chain, in terms of adopting a more environmentally aware attitude. The analysis of these dynamics is visualized with a proposed conceptual model.

1. Introduction

Several green drivers have affected and are continuing to affect the way businesses see environmental issues, and it is becoming a matter of obligation rather than choice to adopt more environmentally friendly behavior. The term "green driver" refers to the initiatives and benefits associated with the motivations for ecological responsiveness. In the literature, numerous drivers, such as economic concerns, legislation, social responsibility, ethics and stakeholder pressures have been proposed to account for suggested to understand the motivational elements that lead companies to engage in green activities (e.g. Bansal and Roth, 2000; Beamon, 1999; Carter et al., 2000; Ferguson and Toktay, 2006; Hervani et al., 2005; Sarkis, 2003; Sharma and Vredenburg, 1998; Walker et al., 2008; Walton et al., 1998). Among these, two stand out as the most effective: legislation and economic concerns. Although in many studies, authors have identified various elements as "green drivers", Bansal and Roth (2000) criticize these studies as not being exhaustive in research, suggesting insufficient specificity in terms of investigating the relationship between these drivers and motivation of companies, whether relationships exist among these drivers, and the circumstances under which the said drivers lead to motivation.

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In the literature, legal and economic drivers have been identified as the strongest. While the legal drivers prove their strengths in terms of conformance, the notion it lacks is the ability to encourage businesses to go beyond the limits set by the rules and regulations to decrease further their negative effect on the environment. Economic drivers complement legal drivers by their ability to threaten businesses with market share loss, which is equivalent to being unable to meet consumer demand. As consumers are the real managers in a market, it is essential to enlist their support and meet their requirements.

If the goal is set as decreasing humanity's negative effects on the environment, the best place to start would be industry, since the negative effect of industry is much greater than those of individuals. Therefore, the efforts of industry to protect the environment are much more effective than that of individuals.

Green consumer demand may show variation from country to country, depending on the culture. This study focuses on the Turkish market and the potential for creating green demand in the consumer market, in order to trigger and strengthen the willingness of businesses to develop a continuous improvement approach to environmentally friendly processes. In this sense, the aim in this study is to answer the following research questions:

(1) What should be the starting point both for individual companies and supply chains for becoming green? Can it be waste management?
(2) What is the level of environmental consciousness of firms and how is it possible to assess the potential level of participation if a waste management system was to be implemented in their supply chains?
(3) Which sector would be the most appropriate for implementing a green policy in terms of attracting the attention of other sectors and customers simultaneously?
(4) What are the dynamics of interdependency and interaction within the upstream and downstream partners in the chain in terms of green consciousness?

In order to conduct this study, there was a need to select such an industry that would be able to attract the attention of both other industries and the consumers once green approaches were adopted and the benefits started to show themselves.

Upon the sector selection, it was necessary to evaluate whether the sector was ready to adopt these new approaches, since this ability will be the determinant of the level to which businesses can turn green. Assuming the possibility that businesses may not in fact be ready for such innovations, the existing business component of waste management was chosen for evaluation as the starting point in the process of assisting business to understand the necessity for and benefits of going green.

2. Literature review

2.1. Green supply chains

When talking about green initiatives, one must not think on a company basis, but on a supply chain basis. This necessity arises from the fact that the competition no longer takes place between companies, but between supply chains (Christopher and Peck, 1997). In order to retain and increase supply chains' competitiveness, the initiatives, be they "green thinking" or "lean", must be adopted by the whole supply chain and coordinated by the focal company (Kampstra et al., 2006; Sheu et al., 2005; Vachon and Klassen, 2006; Walton et al., 1998; Wu and Dunn, 1995). The level of integration determines the environmental performance, because greater supply chain integration leads to better environmental performance (Vachon and Klassen, 2006).

Being green, thus affects environmentally conscious consumers' view of the company (H'Mida, 2009; Maineri et al., 1997), which becomes an advantage for the companies and in turn, their supply chains. Environmentally conscious consumers use their influence through their choice of company, increasing green companies' and supply chains' competitiveness and economic performance (Kumar and Malegeant, 2006; Rao and Holt, 2005). Thus, in order for the green supply chain to be meaningful and profitable, the efforts must be clearly recognizable by the consumers, and stakeholders, in order for companies to be rewarded for these efforts. This raises a critical point: no matter how perfectly green the processes inside the supply chain are in order to gain and raise awareness, a visual tool is likely to be necessary. As D'Souza suggests; eco-labels are an effective tool (2000, 2004). The purpose of "ecolabels" is to show how environmentally friendly a product is to a potential customer, at the point of sale, enabling product evaluation according to environmentally friendliness without the necessity for detailed knowledge of environmental regulations.

Having a green supply chain depends on minimizing (preferably eliminating) the negative effect that the supply chain has on the environment. This requires using environmentally friendly materials as well as minimizing waste, therefore the supply chain must be managed in order to maximize the use of these waste materials ensuring that the only waste material is that which can have no possible further use. This logic is in parallel of the closed loop supply chain concept, because in these chains, the aim is to return used products back into the production process, creating a loop which utilizes all materials in hand, thus minimizing natural resources usage, and in turn, reducing environmental impact, thus, greening the, supply chain.

2.2. Closed loop supply chains and reverse logistics

Wells and Seitz (2005) define closed loop supply chains as: "In general terms, closed loops consist of two supply chains: a forward and a reverse chain whereby a recovered product re-enters the traditional forward chain", while Defee et al. (2009) justify this process, describing "the need to integrate both strategic and operational decisions across the forward and reverse supply chains that a company operates". As it can be understood from this definition, the closed loop supply chain aims to put the supply chain in a recirculation mood, allowing waste minimization.

In regard to the environment and environmentally friendly implementations for businesses, "closed loop supply chain" is the targeted formation, as it serves the aim of protecting the environment by minimizing the waste generated. Thus, it can be said that if closed loop supply chain is the target, reverse logistics, which is a means of green supply chain management, is the best approach to reaching that target, because in order to minimize waste, a reverse flow must be introduced into the supply chain and it should be managed in order to make best use of the materials/products returned, through repair and reuse, refurbishment, remanufacturing, cannibalization, or recycling (Kumar and Malegeant, 2006).

Because of this close relationship, the literature of closed loop supply chains and reverse logistics are examined in parallel in this study.

In the closed loop supply chains literature, it is possible to see a point on which many authors agree, that in order to achieve a closed loop supply chain, one company in must undertake the leadership (Clendenin, 1997; Defee et al., 2009) and coordinate the supply chain (Kampstra et al., 2006; Sheu et al., 2005).

Closed-loop supply chains add complexity to the existing supply chain, as it usually requires investment and the newly added functions of the supply chain are full of uncertainties (Kocabasoglu