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Sustainable supply chain management and green marketing mapped out in a hub-and-spoke architecture

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ABSTRACT

Both sustainable supply chain management and green marketing have emerged as important areas of study and managerial focus since the notion of sustainability entered the corporate mainstream. Both fields have made tremendous strides at the same time. In order to effectively meet the demands of green customers, it has been acknowledged that green marketing and sustainable supply chain management should be combined. Previous studies have investigated the point-to-point integration strategy. Using the 6Ps (product, promotion, planning, process, people, and project), this article presents a novel hub-and-spoke integration model to connect green marketing with sustainable supply chain management. The 6Ps integration model has been put to the test in an empirical investigation involving several sectors. The empirical study's findings on integration dimensions, integration tactics, drivers, and impediments, and management implications are provided. Green marketing and sustainable supply chain management may now share information, materials, and financial resources via a number of streamlined channels made possible by the new integration model. It may help businesses improve their financial line, social impact, and environmental sustainability.

Keywords: Multi-dimensional integration, Sustainable supply chain management, Green marketing, Hub-and-spoke integration model

1. Introduction

It has been acknowledged as one of the world's greatest challenges since the definition of sustainability or sustainable development was published by the World Commission on Environment and Development in the late 1980s (WCED, 1987) (Bateman, 2005; Espinosa, Harnden, & Walker, 2008; Ulhoi, 1995; Wilkinson, Hill, & Gollan, 2001). Sustainability has evolved from a technical notion into the political and, eventually, the corporate mainstream during the last two decades as globalization has spread (Liu, Leat, & Smith, 2011). Supply (all parties in the supply chains), demand (customers and interest groups), and the general environment (regulations, society, and natural resources), are the three most important factors that determine the business environment and, in turn, company strategies (Svensson, 2007). Sustainable Supply Chain Management (SSCM) and its effects on green marketing strategies have received little

study. To maximize overall business performance, it is critical to understand how green marketing and SSCM interact with one another from an integrated management perspective (Ozanne & LeCren, 2011). This will allow companies to better align their initiatives and practices with sustainable development. According to the definition, marketing should be an integral element of all supply chains, and this incorporation need not occur until the final stages of production. Since the advent of the "sense-and-response" business model (Siegel, Shim, Walker, et al., 2003), marketing has expanded to take on additional roles, such as product and service creation, sales, forecasting, and communication. Therefore, a multi-perspective strategy is needed to integrate marketing into supply chain management, which means that many integration factors need to be explored.

This study extends prior research on the integration of conventional marketing and supply chain management to the broader context of sustainable development, with a particular emphasis on green marketing and supply chain management (SSCM). Researchers have looked at how several aspects of the green marketing mix—product, promotion, planning, process, people, and project—interact with SSCM from a theoretical and an empirical perspective.

2. Literature review

New business environment resulting from the concept of sustainability not only has significantly influenced the activities companies conduct, but also has caused the shift of the basic values and attitudes of societies towards business. This section reviews related work addressing how

2.1 Green Marketing

Green marketing has been defined by different scholars in different ways. There seem to be three main views on its definitions. The first view is linking green marketing to identifying and satisfying green customers, and promoting environmentally-friendly products. For example, Banyte et al. define it as “determining the need to know the new, so called green, consumer and to adapt marketing decisions to the focus on ascertaining the expectations and satisfying the needs of such a consumer” (Banyte, Brazioniene, & Gadeikiene, 2010). Along the line of green customers, some researchers investigated the importance of using branding techniques to introduce green products to green markets (Muntean & Stremtan, 2010). It was found that most customers cannot easily identify greener products (other than clean products) although they would be in favor of greener products, and that most existing marketing strategies are not particularly relevant or engaging (Tureac et al., 2010). A second view is built upon the classic marketing mix (i.e. the traditional 4Ps, standing for product, price, promotion and place) and brings together the triple bottom line objectives (Needle, 2010). For example, the Green Strategy Mix

Empirical research findings are used to inform management suggestions. In what follows, we'll take a look at some relevant literature.

Section 3 outlines the theoretical 6Ps integration model. The empirical investigation of the multi-dimensional integration model is presented in Section 4. In Section 5, managerial ramifications are discussed, and in Section 6, final thoughts are offered.

business has changed their operations to satisfy the society renewed values and attitudes and how the environment has presented new opportunities to business. Particularly, the review will be focused on three sub-topic areas: green marketing, SSCM, and B2B integration.

proposed by Violeta and Gheorghe (2009) suggested six dimensions, including 5Ps+EE, standing for planning, process, product, promotion, people and eco-efficiency. A third view argues that green marketing is beyond the role of linking to green customers and marketing mix, and should expand to include other aspects of corporate demand management, such as predicting demand for environmentally-friendly products, positioning and demand stimulation for recycled and remanufactured products, generating demand for build-to-order products, and building competitive advantages from a focus on environmental priorities (Sharma et al., 2010). This third view shows clear indication of the integration of green marketing with other business processes in the forward and reverse supply chains (recycle and remanufacturing). Because of the multi-facets of the green marketing concept (Crane, 2000), many alternative terms have been used to represent more or less the same meaning, such as environmental marketing (Sheth & Parvatiyar, 1995), environmental marketing management (Peattie, 1995), environmental product differentiation (Reinhardt, 1999) and sustainability labeling schemes (De Boer, 2003). Along with the fast growing interests

and practices in recent years, green marketing has also experienced some problems. A major problem is that people in some countries become increasingly skeptical about the credibility, validity and usefulness of green marketing (Leonidou & Hultman, 2011). The reasons behind the problems are attributed to a number of factors, including the growing number of companies promoting their environmental and social credentials, the increasing buyer complaints to various watchdog organizations about misleading claims after suffered from fake green products, and consumer concerns about the way some green-themed advertisements are made and presented (Yang, 2010). It has been voiced that government should take a leading

role in setting up regulations for fair green marketing to increase consumer's confidence and to control free riders. It has been suggested that government's role in green marketing can be enhanced from two sides, on the one hand, by providing institutional incentives to firms such as subsidies, tax credits and investments in R&D on green products (Smirnova et al., 2011); on the other hand, by educating consumers, such as helping consumers understand the essence of green products, improve consumer's knowledge on environmental protection and society responsibilities, and to guide consumers to establish the concept of green consumption (Deng & Huang, 2009).

2.2 Sustainable supply chain management (SSCM)

SSCM is defined as “the strategic, transparent integration and achievement of an organization's environmental, social and economic goals in the systematic co-ordination of key inter-organizational business processes for improving the long-term economic performance of the individual company and its chains” (Carter & Rogers, 2008). Traditionally, there are restricted point of origin and point of consumption of products or services in the description of supply chains in literature (Svensson, 2007). The definition from Carter and Rogers implies that a broadened approach is required for SSCM, not only in emphasizing economic, ecological and social aspects of business practices and theories, but also in extending the scope beyond the restricted point of origin and end boundaries.

SSCM is sometimes referred to as closed-loop supply chain management or green supply chain management. Closed-loop supply chains are those supply chains where care is taken of items once they are no longer desired or can no longer be used. A closed-loop supply chain consists of a forward chain and a reverse chain (Chan, Yin, & Chan, 2010; Yuan & Gao, 2010). In the forward chain, raw materials are transformed into new products, distributed to and used by customers. In the reverse chain, used products are recycled, reused, repaired or remanufactured (Hoek, 1999; Simpson, Power, & Samson, 2007). Increasing legislation in the field of producer responsibility, take-back

obligations and setting up collection and recycling systems has led to a strong focus on closed-loop supply chain management. The primary objective of closed-loop supply chains is to improve the maximum economic benefit from the end-of-use products, while SSCM requires the co-ordination of the social, environmental and economic dimensions. However, closed-loop supply chains are regarded as environmentally-friendly by mitigating the undesirable environmental footprint of supply chains. Therefore closed-loop supply chains are assumed to be sustainable almost by definition (Neto, Walther, Bloemhof, van Nunen, & Spengler, 2010). Some scholars argue that there should be clear distinction between SSCM and green supply chain management because sustainable supply chains are not restricted to the so-called “green” supply chains (Zhu, Sarkis, & Geng, 2005). In order to be truly sustainable, supply chains must operate within a realistic financial structure, as well as contribute to environment and our society. Supply chains are not sustainable unless they are realistically funded and valued (Centikaya et al., 2011). From this perspective, SSCM is a more accomplished concept which can better highlight the importance of achieving the triple bottom line objectives simultaneously than the other two terms, i.e. green supply chain

management and closed-loop supply chain management. This view is maintained in this paper and SSCM is used consistently to discuss the operations and co-ordination aspect of business aiming to address the triple bottom line.

Most existing work in the area has discussed a number of more or less isolated and to some extent replicated aspects of SSCM, including corporate social responsibility, green/environmental purchasing, reverse logistics (e.g. the 4Rs — reuse, recycle, repair and remanufacturing) (Linton, Klassen, & Jayaraman, 2007), and life-cycle assessment. A conceptual framework was proposed to glue together the different aspects of sustainability in SSCM (Svensson, 2007). A main contribution

2.3 B2B integration

Integration of sustainable business has been generally discussed. A main stream in the integration theme is the integration of environmental, social and economic criteria that allow companies to achieve long-term economic viability (Hoek, 1999; Svensson, 2007). Carter and Rogers (2008) proposed an integration framework based on the triple bottom line and four supporting facets of sustainability (i.e. risk management, transparency, strategy and culture) and conceptualized potential business performance in three levels (i.e. good, better and best). Second stream of work is on the integration of upstream and downstream activities in the SSCM. In this stream most work has been addressing co-ordination with immediate customers along with interaction with immediate suppliers, but left the integration with end customers (i.e. where external marketing occurs) remaining under veil (Vachon & Klassen, 2006).

Two generic types of integration have been defined: logistical and technological integration. Logistical integration is the extent to which co-operation in managing explicit information and material flows along the supply chains (Frohlich & Westbrook, 2001; Linton et al., 2007). This information-sharing view was later extended to include the flexibility in the supply chain capabilities especially when facing unforeseen events (Vachon & Klassen, 2006). Such uncertainty which requires high flexibility of supply chains can be caused by incomplete or un-detailed

of the framework is the definition of a multi-order supply chain which connects the point of consumption of the first-order supply chain to the point of origin in the second-order supply chain. Earlier, a value-seeking approach was investigated including sets of actions for various players along the supply chain as well as measures of SSCM success (Hoek, 1999). Empirical study has also been widely undertaken looking at SSCM practices in different countries such as in China (Zhu et al., 2005), Russia (Smirnova et al., 2011), New Zealand (Ozanne & LeCren, 2011), and across different industries including electronics (Neto et al., 2010), automotive (Sharma et al., 2010) and apparel (Zhu et al., 2005).

contracts which allow for transactions between parties to be neither overly constrained nor highly formalized, but instead somewhat more organic. On the other hand, different parties in the supply chains sharing technical and tacit knowledge in strategic areas (such as product development, process re-engineering and technical training) are defined as technological integration (Vachon & Klassen, 2006; Zhu et al., 2005). It was argued that the technological integration could provide more opportunities and potential benefits for all parties involved in the knowledge sharing in SSCM and green marketing. For example, assistance from green marketing by involving customers in the green product development, manufacturing and distribution can decrease the time-to-market time, which is in turn beneficial to customers. To foster the integration, customers can provide their expertise through marketing to push faster development of new competencies and capabilities in their supply chains. This view was further supported by Sharma et al. in identification of the need and importance of the interfaces between the supply and demand sides of business (Sharma et al., 2010). This paper is focused on the integration of SSCM and green marketing. Discussed in the existing literature is the interfacing between green marketing and SSCM using point-to-point integration model (Bussler, 2003), i.e. green marketing is only considered either at the beginning or the end of the sustainable supply chains, as shown in Fig. 1. The limitation of the point-to-point integration is

that important information about green customer's requirements collected from green marketing activity, if taken in at the beginning of the sustainable supply chains, often gets misunderstood or distorted after it flows a long way down the supply chains. If the green customer's requirements were input at the end of the sustainable supply chains, the situation is worse, because often the "make-and-sell" mode is in operation within the business process and green

marketing's value is unfairly degraded. In both cases, green marketing is not seamlessly integrated into the SSCM. To overcome the limitation of the point-to-point integration model, this paper proposes a hub-and-spoke integration model which allows the inputs from green marketing to be incorporated into sustainable supply chains with multiple integration dimensions (Liu, Duffy, Whitfield, & Boyle, 2010), to achieve more effective integration effects.

2. A theoretical hub-and-spoke model for multi-dimensional integration

Traditionally, marketing, a means to determine customer requirements, is integrated to supply chain management either at the beginning through product design such as using Quality Function Deployment method or at the end of the chain through hard promotion of products such as advertising. In the context of green marketing and sustainable supply chain management, new integration models are required to address the triple bottom line objectives. This section proposes a theoretical hub-and-spoke integration model which integrates green marketing into sustainable supply chain management from multiple perspectives, namely the 6Ps — products, promotion, planning, process, people and project. Fig. 2 illustrates the hub-and-spoke integration model, with green marketing as the central hub. Information, materials, people and funds etc. flow along the six dimensions (the spokes) to facilitate the integration. The arrows on the spoke represent the direction of the flows. For example, on the product spoke, green marketing communicates the requirements of green products, based on the understanding of green customers' needs, to the SSCM. Meanwhile, SSCM communicates the supply

chain capability of ensuring the products' green credentials back to the green marketing. The meanings of the 6Ps and rationality for including the 6Ps in the model are summarized in Table 1. The 6Ps' hub-and-spoke integration model has included two key dimensions (i.e. product and promotion) from the traditional marketing mix (Needle, 2010) and given them new meanings in the context of sustainability. The planning and process dimensions are important success factors in SSCM at both strategic and operational levels. The people dimension is inspired by modern supply chain management and operations management theories in encouraging a higher degree of personal responsibility and engagement (Slack, Chambers, & Johnston, 2010), which fits well in the context of achieving triple bottom line objectives. Finally, project dimension allows the other five dimensions to be materialized, populated and illustrated. Key questions are: how the six integration dimensions can be or have been implemented in practices, and what are the drivers and potential consequences for the 6Ps integration model? The following section discusses an empirical study on the research questions.

4. Empirical study on the 6Ps integration model

The purpose of undertaking an empirical study is to find out whether the theoretical multi-perspective model is appropriate for

integrating green marketing and sustainable supply chain management.

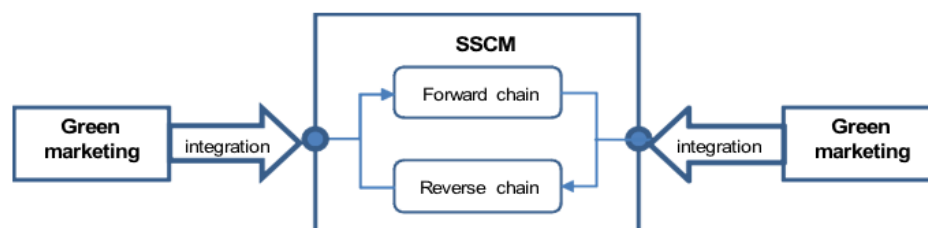


Fig. 1. Illustration of point-to-point integration model.

4.1 Method

Primary data for the qualitative-based study were collected from companies in a number of industries. Companies for the data collection were selected using the following criteria:

- 1) The companies have been recognized by peers or customers to have implemented green business in practice;
- 2) Companies provide green products to customers, more specifically they are in manufacturing operations rather than pure service operations, so that clear supply chains can be identified in terms of material and information flows;
- 3) Companies from aerospace, automotive, electronics and apparel are preferred because of their leading role in promoting sustainable business;
- 4) Companies with global supply chains are preferred as they are more often exercising green marketing to access global markets and global resources;
- 5) Companies have business-to-business trading and only the B2B marketing is considered as the context for this discussion.

The data collection process was conducted through in-depth interviews (Saunders, Lewis, & Thornhill, 2009). A pilot study was undertaken to test out the core constructs of the 6Ps integration model to make sure that

5. Conclusions

From this study we can conclude that integration of green marketing and sustainable supply chain management needs a multiple dimensional approach. Product, promotion, planning, process, people and project all make important contributions to the integration. Compared with the traditional point-to-point B2B integration model, the hub-and-spoke integration model proposed in this paper allows the flow of information, material, people and fund etc. more fluently across the supply chains and outreaching green customers. Empirical results show that

the constructs were understandable and meaningful in B2B context. The initial pilot study was organized in the form of an open round-table discussion with five operations managers and marketing directors. Apart from testing the 6Ps model construct description, an initial list of questions for each construct was also tested. As a result, some question wordings were slightly changed, and the final list of questions for the qualitative study was prepared for the in-depth one-to-one interview. In insightful interview stage, a total of twelve companies took in participation. The profile of the participated companies is shown in Table 2. In the table, definition of the size of a large or medium organization is adopted from EU classification, i.e. large-sized companies have over 250 employees (Needle, 2010). The managers interviewed all had at least five years of experience, as can be seen from the last column of Table 2. The reason to have chosen

experienced managers is that we believe that more experienced managers, compared with novices, have better knowledge of their organization in general and more specifically have better formed views on the research issues under investigation. Therefore, experienced managers are less likely to be influenced or led by the interviewers when answering questions, which can help reduce a source of bias in interview data.

multi-dimensional integration has been in practice in industries, this is particularly true in large companies. Various corresponding strategies have been put forward and implemented for the product-, promotion-, planning-, process-, people- and project-based integration. Companies were aware of the internal and external drivers for and consequences of the integration. But there is a clear need to develop more systematic approaches and techniques for a holistic view on the issue.

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