Supply Chain Management versus Sustainable Chain Management


Abstract

The objective is to describe an extended approach to supply chain management (SCM), termed ‘sustainable chain management’. The paper provides a conceptual discussion of current definitions and approaches to SCM. The concept of sustainable chain management is described and illustrated. The approach connects the upstream and downstream elements of the supply chain, as well as re-connecting the ‘before’ and ‘after’ elements (or ‘extremity elements’) of supply chains. A comprehensive and logical model of sustainable chain management can be formulated and illustrated. This model, which represents a supply chain as a ‘loop chain’ without loose ends, overcomes the deficiencies of existing models of SCM by introducing vertical integration of the elements and interfaces of SCM. The proposed model has practical implications for best practice and sustainable management of supply chains. The paper presents an innovative model for SCM. The model has also implications for research in this area.

Keywords: Supply chain management, sustainable chain management, channel, connect, reconnect.

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Introduction
The significance of supply chain management (SCM) has been especially apparent since the early 1990s, although the concept dates from the early 1980s (Oliver and Webber, 1982). The significance of SCM rests on the dependencies that exist among elements in the supply chain from the point of origin of a product/service to the point of consumption of that product/service (Lambert et al., 1998; Håkansson and Snehota, 1995; Stern, 1969; Alderson, 1965, 1957; McCammon and Little, 1965, Weld, 1916). The point of origin in SCM usually refers to suppliers or manufacturers (Carter et al., 1995; Ellram and Cooper, 1993; Novack and Simco, 1991), whereas the point of consumption refers to consumers, customers, or end-users (Min and Mentzer, 2000; Lambert et al., 1998; Jones and Riley, 1985).

The chain (or ‘channel construct’) has been defined by Bowersox and Closs (1996) as the arrangement of intra-company units and extra-company agents and dealers (wholesale and retail) through which a commodity, product, or service is marketed. In this channel construct, ‘dependence’ is said to exist if a link or a bond exists between one or more elements in relation to another in the channel (Lambert et al., 1998; Håkansson and Snehota, 1995). In this regard, Svensson (2002) classified the dependence between elements in channels into three principal categories (time-dependence, relational-dependence, and functional-dependence) and three sub-categories (unidirectional/bi-directional, direct/indirect and vertical/horizontal).

Although the term ‘supply chain management’ (SCM) was originally introduced to represent a new approach to the management of integrated marketing channels to replace traditional approaches that were considered unsatisfactory and inadequate (Oliver and Webber, 1982), the underlying ideas of SCM have a long history (Arnold and Faurote, 1919; Ford and Crowther, 1923; Faurote, 1928). Nevertheless, despite the long history of the ideas and the general acceptance of the approach, concerns about the appropriateness of the current theoretical and managerial boundaries of
SCM have been raised. In particular, it has been suggested that there is a need for a broader and more comprehensive approach to the concept and practice of SCM (Cooper et al., 1998; Svensson, 2002). Some time ago, Levitt (1960) introduced the concept of ‘marketing myopia’ in warning against the dangers of a narrow view of the environment. More recently, Stock (2002) revisited the concept of ‘marketing myopia’ in arguing that the potential of SCM might not be fully realised unless some pertinent lessons from logistics were noted and applied.

The present study adopts a similar view in contending that a myopic view of SCM can inhibit the benefits and sustainability of SCM over time and across contexts. The objective of this paper is, therefore, to describe an extended approach to SCM termed sustainable chain management, whereby a ‘circulation approach’ is taken to vertical components and interfaces of supply chains.

Relevance of sustainable chain management
The author believes that the recent UN-report on Climate Change 2007 – The Physical Science Basis (IPCC WGI, 2007) will sooner or later force the global society (e.g. the United Nations, the European Union, regional trade agreements and governments) to impose practices of ‘sustainable chain management’. It will affect the current concept of SCM. Currently, there are a number of more or less isolated and to some extent replicated elements in literature that strive to address ‘sustainable chain management’, such as: corporate social responsibility (e.g. Dyllick and Hockerts, 2002), sustainable supply network management (e.g. Young and Kielkiewicz-Young, 2001), supply chain environmental management (e.g. Lippman, 1999), green purchasing strategies (e.g. Min and Galle, 1997), environmental purchasing (e.g. Zsidisin and Siferd, 2001), green marketing (e.g. Crane, 2000), environmental marketing (e.g. Sheth and Parvatiyar, 1995), environmental marketing management (e.g. Peattie, 1995) and environmental product differentiation (e.g. Reinhardt, 1999), reverse logistics (Zikmund and Stanton, 1971), sustainability labeling schemes (e.g. DeBo-
er, 2003), environmental management (Hoffman, 2000), life-cycle assessment (Welford, 1999), ISO-14000-certifications (ISO, 2007), efficiency of vertical integration (e.g. de Díez Vial, I., 2005) and business excellence model (e.g. González and González (2006). Other generic elements connected to ‘sustainable chain management’ are: product returns, source reduction, recycling, material substitution, reuse of materials, waste disposal, refurbishing, repair and re-manufacturing (Stock, 1998). The common denominator is that they all require an extended approach beyond the restricted point-of-origin-and-end boundaries in descriptions of SCM in literature, which in this paper will be referred to as ‘before’ and ‘after’ elements – so-called ‘extremity echelons’. In fact, the presented frame of reference implicitly addressed the need for taking into consideration what may be important beyond the point of origin-and-end boundaries affecting green and sustainable purchasing, production and distribution (e.g. Stock, 1998).

Therefore, this paper relates to these different elements of sustainability and provides a conceptual framework of ‘sustainable chain management’ that may be a fundament to glue them together. At the end of the day, it aspires to contribute to the stakeholder value in a broad sense (Freeman, 1984; Fineman and Clarke, 1996; Banerjee et al., 2003; Waddock et al., 2002). Stakeholder value is a broad concept and implies that a company has responsibilities and commitments to many different stakeholders, not just investors or owners of the company, but also employees, customers, suppliers, societies and the environment (Mathur and Kenyon, 1997). So, this paper may make a contribution to the interfaces between purchasing, logistics, physical distribution, marketing and environmental theories. For this purpose, the approach of traditional SCM is broadened to highlight sustainable elements of the concept. It is limited to vertical elements, while the horizontal ones should not be ignored from a business point of view. In fact, there is a lot of room for upstream and downstream collaboration amongst competitors in a given supply chain or across supply chains, which in turn may enhance aspirations of sustainable chain management.
Supply chain management

There have been various definitions and approaches to SCM. Oliver and Webber (1982) can be regarded as the originators of the term ‘supply chain management’ when they used it to describe a new perspective on marketing to replace the traditional approaches to managing integrated marketing channels, which they regarded as unsatisfactory. Since then, many other scholars have applied the concept of SCM in various ways (Jones and Riley, 1985, 1987; Houlihan, 1985, 1987; Snowdon, 1988). In particular, Stevens (1989) and Jones and Riley (1987) have argued that the development of integrated channels requires the management of business activities to be viewed from three perspectives—(i) strategic; (ii) tactical; and (iii) operative.

Other authors have also made contributions to a better understanding of the scope and structure of the concept of SCM. For example, Lummus et al. (2001) contended that SCM includes logistics flows, customer-order management, production processes, and the information flows necessary to monitor all the activities at the supply-chain nodes. Mentzer et al. (2000) felt that SCM is essentially about the management of inter-firm relationships, and that an understanding of ‘partnering’ is crucial to the development of successful retail supply-chain relationships. Chandra and Kumar (2000) noted the importance of flexible organisational relationships, total supply-chain coordination, improved inter- and intra-enterprise communication, outsourcing of non-core competencies, built-to-order manufacturing strategy, inventory management, and cost control.

Min and Mentzer (2000) saw SCM as being composed of two components—an integrated business philosophy and implementation actions; these authors emphasised that SCM extends the concept of ‘functional integration’ beyond a company to all the companies in the supply chain, and that each member of a supply chain contributes to the competitiveness of the chain. Chandrashekar and Schary (1999) also emphasised the integration and coordination of business operations across organisational boundaries. Lambert et al. (1998) contended that the objective of SCM is to maximise competitiveness and profitability for whole supply chain, including the end-customer.
SCM has been perceived as a business philosophy that strives to integrate the various business operations of companies in a channel. In this regard, Bechtel and Jayaram (1997) argued that SCM crystallises the idea of a ‘business ecosystem’ by providing a process framework that enables companies to evolve together, rather than merely compete. Similarly, Coyle et al. (1996) concluded that the perspective of a supply chain recognises that a company is, in a sense, in ‘partnership’ with its vendors and its customers in bringing a product to market.

Harrington (1995) emphasised information flows in noting that SCM deals with bi-directional flows of information that encompass all parties from the supplier’s suppliers to the end-users. Carter et al. (1995) focused on the flow of goods from suppliers to the ultimate consumers, noting that the goal is to meet customer service objectives while minimising inventory costs. Johannson (1994) emphasised the role of SCM as an operations approach to procurement, observing that this requires all participants in the supply chain to be properly informed.

Ellram and Cooper (1993) defined SCM in terms of the analysis and management of the entire network, from the supplier through to the ultimate customer, with a view to achieving the best outcome for the whole system. Turner (1993) also saw SCM in terms of the links in a chain from suppliers of raw materials, through the various levels of manufacturing, to warehousing, and, finally, distribution to the final customer. Similarly, Christopher (1992) perceived the supply chain as a network of organisations with upstream and downstream linkages that produce value in the form of products and services for the ultimate consumer. Towill et al. (1992) saw the supply chain as a system constituted by material suppliers, production facilities, distribution services, and customers—linked together via the forward flow of materials and the feedback flow of information. Lambert (1992) regarded the supply chain as a single entity that aims to satisfy the needs and wants of the ultimate consumer.

Cavinato (1992) perceived the supply chain as actively managed channels of procurement and distribution that add value along the product
flow from original raw materials to final customer by concentrating on relational factors rather than transactional factors. Lee and Billington (1993) referred to networks of manufacturing and distribution sites that procure raw materials, transform them into intermediate and finished products, and finally distribute the finished products to customers.

Scott and Westbrook (1991) stated that the supply chain is the chain linking each element of the production and supply processes from raw materials through to the end customer. Similarly, Novack and Simco (1991) stated that SCM covers the flow of goods from the supplier through the manufacturer and distributor to the end-user. Langley and Holcomb (1992) saw SCM as focusing attention on the interactions of channel members to produce an end product or service that provides best comparative value for the end-user. Stevens (1990) saw SCM as being concerned with the flow of material from suppliers, through the value-adding processes and distribution channels, to customers. Ritchie (1990) considered the supply chain to be a single entity and argued that the end performance of delivering satisfaction to customers is only as good as the weakest link in the supply chain. Ellram and Cooper (1990) perceived SCM as an integrating philosophy to manage the total flow of a channel from supplier to ultimate customer. Houlihan (1988) argued that SCM covers the flow of goods from supplier through manufacturer and distributor to the end-user, and Houlihan (1987) stated that SCM strives to balance a range of business operations, including promotion, sales, distribution, and production. Jones and Riley (1985) concluded that SCM deals with the total flow of materials from suppliers through to the end-users.

This review of opinions and definitions suggests that SCM is a business philosophy that strives to integrate the activities, actors, and resources of channels from the point of origin to the point of consumption. This means that SCM involves different kinds of dependencies in and between companies in channels from manufacturers/suppliers to customers/consumers.

More recently, a broader and more complex approach to SCM has been proposed, incorporating a wider variety of business functions (Levy and Gre-
wal, 2000). For example, although Mentzer et al. (2001) had a relatively comprehensive view of SCM as a systemic and strategic coordination of traditional business functions within a particular company and across businesses within the supply chain, the focus of SCM according to this definition was still on a particular channel from the point of origin to the point of consumption. Explicit reference to other channels plays no part in this conception of SCM. Svensson (2002) has argued that horizontal issues should be included in conceptions of SCM. According to this view, SCM is a business philosophy that should incorporate operative, tactical, and strategic considerations in addressing the overall bi-directional dependencies of activities, actors, and resources from the point of origin to the point of consumption in and between channels. However, this paper is limited to discuss the vertical elements of SCM.

**Sustainable chain management**

The complexity in supply chains relates to generic components (such as actors, activities, and resources) and generic interfaces (such as interaction, coordination, cooperation, and competition). Taken together, these components and interfaces shape the notion of sustainable chain management. The approach of sustainable chain management is contrasted with SCM in Figure 1.

**Figure 1. Sustainable Chain Management versus Supply Chain Management**

![Sustainable Chain Management versus Supply Chain Management](image-url)
As mentioned previously, SCM tends to focus on the connection of elements from the point of origin to the point of consumption (see Figure 1). This means that the boundaries and extensions of channel elements in SCM resemble the classic and traditional structure of elements in distribution/marketing channels (Alderson, 1957, 1965; Weld, 1916). The elements prior to the point of origin (for example, actors and activities associated with the utilisation of re-cycled resources) and the elements following the point of consumption (for example, actors and activities associated with the subsequent re-cycling of used resources) are rarely acknowledged. The connections between these ‘before’ and ‘after’ elements, which can be referred to as the ‘extremity elements’, are not usually acknowledged in SCM.

In contrast, the boundaries and extensions of sustainable chain management take into account the ‘re-connection’ of these loose ends by considering the extremities of the points of origin and consumption—that is, the ‘before’ and ‘after’ elements in channels. In effect, sustainable chain management ‘bends’ the channel to achieve re-connection of the loose ends, as illustrated in Figure 2.

Figure 2. Connection and reconnection of the extremity elements

Although Figure 2 provides a useful overview of the main principle of sustainable chain management (by reconnecting the point of consumption with the point of origin), a more accurate representation of
sustainable chain management would also include the elements of the supply chain itself (as envisaged in traditional SCM). If this is done, as shown in Figure 3, a full representation of the concept of sustainable chain management is obtained. As shown in Figure 3, the point of origin is connected with the point of consumption by the elements of the supply-chain elements. In turn, the point of consumption is then reconnected with the point of origin by the ‘extremity elements’. The overall chain is thus depicted as a ‘loop chain’, without loose ends, which enables the achievement of sustainable chain management over time and across contexts.

Figure 3. Sustainable chain management—connecting upstream/downstream supply chain elements and re-connecting extremity elements
Sustainable chain management not only requires a holistic view of the components (actors, activities, and resources) of the supply chain that goes beyond the points of origin and consumption, but also requires a holistic view of the interfaces (interactions, coordination, cooperation, and competition) of the supply chain that goes beyond the points of origin and consumption. Sustainable chain management is thus concerned with the total circulation of the components in the different interfaces. Moreover, sustainable chain management has neither a beginning nor an end; by adopting the shape of a ‘loop chain’, it connects the upstream and downstream elements of SCM, as well as reconnecting the ‘before’ and ‘after’ elements (or ‘extremity elements’).

**Concluding reflections**

The original focus of SCM was on the supply chain from the point of origin to the point of consumption (Oliver and Webber, 1982; Jones and Riley, 1985; Houlihan, 1985, 1988; Ellram and Cooper, 1990; Scott and Westbrook, 1991). Some authors have emphasised the entire supply chain (Mentzer et al., 2001; Cooke, 1997; Turner, 1993; Cavinato, 1992), whereas others have focused on a limited part of it (Davis, 1993; Giunipero and Brand, 1996; MacBeth and Ferguson, 1993). More recent developments from Cooper et al. (1998) have included: (i) recognition that the supply chain is a network of multiple businesses and relationships, rather than merely being a chain of one-to-one business relationships; and (ii) a focus on the ‘reverse’ supply chain (or ‘demand chain’) from the point of consumption to the point of origin.

Despite these and other developments, difficulties remain with existing formulations and approaches to SCM. In particular, they ignore the reconnection that should exist in sustainable chain management between the point of consumption and the point of origin via the ‘extremity elements’ that follow the point of consumption and precede the point of origin. Such a reformulation of SCM is required to address the question of the total circulation of components and interfaces in and between channels. It is thus
insufficient and simplistic to do no more than match supply and demand between the points of consumption and origin in channels; rather, a re-definition and broadening of the boundaries of SCM with a view to achieving a ‘total circulation’ approach is required for best practice in SCM. It should be noted that the introduced framework is limited to the vertical elements of sustainable chain management, where the horizontal ones between chains provide an arena for further development and research. As illustrated in Figure 3, the present study has provided a model of sustainable chain management, with significant implications for best practice and future research in this area.

Sustainable chain management thus represents a significant broadening of the theoretical foundation of SCM. As such, it has the potential to improve theory generation and best practice in SCM in the future. It also has implications for the sustainable recycling of resources and the conservation of valuable energy resources. For example, it implicitly connects to the recent UN-report (IPCC WGI, 2007, p. 2), which describes progress in understanding of human and natural drivers of climate change, observed climate change, climate processes and attribution, and estimates of projected future climate change. It is contended that the research findings from science presented in this report regarding the projected future climate change on Earth should and will impact current views on SCM. This UN-report should impact future business practices and forthcoming theory generation in the field of SCM. Therefore, taking into account the conclusions of the UN-report, concerns about the appropriateness of current SCM-approaches of business practices and theory generation may be raised.

References


