

2.1 Supply chain

This section focused on the literature that analysed the term “supply chain”. The concept of a “supply chain” was explored in terms of its definition, components, role in an organisation, organisational structure and costs.

2.1.1 Definition

Several definitions of a supply chain were available in the literature. Most authors agreed that a supply chain could be defined in terms of many facets, i.e. (solely or as a combination of two or more aspects) material flow, information flow, entities involved, monetary flow, objective/goal, role in an organisation, geography and organisational structure. These facets are explored further later in this section.

The term “supply chain management” (SCM) was first time used in the 1940s (Stadtler & Kilger (eds.), 2007). Table 2-1 presents a list of initial definitions, from the 1980s and 1990s, of the term “supply chain” as identified in the literature.

Author	Definition
Jones & Riley (1985)	Total flow of materials from suppliers through end users.
Christopher (1986)	Series of activities and organisations that materials move through on their journey from initial suppliers to final customers.
Stevens (1989)	The connected series of activities, concerned with planning, co-ordinating and controlling material, parts and finished goods from supplier to customer.
Cooper & Ellram (1993)	Total flow of distribution from supplier to the ultimate customer.
La Londe & Masters (1994)	A set of firms that passes material forward.
Fisher (1997)	Supply predictable demand efficiently at the lowest possible cost.
Lambert, Stock & Ellram (1998)	Alignment of firms that brings products and services to market.
Monczka, Trent & Handfield (1998)	Integrate and manage the sourcing, flow and control of materials using a total systems perspective across multiple functions and multiple tiers of suppliers.

Table 2-1: Initial definitions of supply chain

As can be seen from the above table, the earlier definitions found a supply chain to be unidirectional (supplier to customer) and considered only its tangible elements (material movement).

One of the most used definitions of a supply chain was given by Christopher (2005:15), who defined it as: “a network of organizations that were involved, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services in the hands of ultimate customer.” This definition was a step up from the previous definitions, as it indicated that supply chains were bi-directional (upstream/downstream), managed processes and organisations.¹⁴ The focus, however, was still on managing customer expectations and internal processes.

A supply chain was also defined by Investorwords (2007:1) as “the network of retailers, distributors, transporters, storage facilities and suppliers that participate in the sale, delivery and production of a particular product.” This definition was aligned with the previous definition, suggesting the involvement of external organisations in a supply chain.

Two supply chain bodies considered supply chain activities in order to define the term “supply chain”. The first was the Association for Operations Management (APICS). Blackstone (ed.) (2008:134) defined a supply chain as “the global network used to deliver products and services from raw materials to end

¹⁴ The organisations included manufacturer, logistics service providers and customers (Christopher, 2005).

customers through an engineered flow of information, physical distribution, and cash.”

A second, similar body, the Supply Chain Council (SCC) (2008), defined supply chain activities as all customer interactions, from the order entry through to paid invoice; all products (physical, material or service) from the supplier’s supplier to the customer’s customer; and all market interactions, from the understanding of the aggregate demand to the fulfilment of each order.

The above two definitions saw a supply chain as a global phenomenon (global network) and focused further on its processes, which concerned both suppliers and customers. This also indicated that the monetary aspect¹⁵ should also be considered to be part of a supply chain.

Mentzer, DeWitt, Keebler, Min, Nix & Smith *et al* (2001:5) defined three levels of supply chains, as shown in Table 2-2.

Level	Definition
Basic supply chain	a supply chain is a set of three or more firms directly linked by one or more of the upstream and downstream flows of products, services, finances, and information from a source to a customer.
Extended supply chain	an extended supply chain includes suppliers of the immediate supplier and customers of the immediate customer, all linked by one or more of the upstream and downstream flows of products, services, finances, and information.
Ultimate supply chain	an ultimate supply chain includes all the firms involved in the upstream and downstream flows of products, services, finances, and information flow from the initial suppliers to the ultimate customer.

Table 2-2: Three levels of supply chain

Source: Adapted from Mentzer, DeWitt, Keebler, Min, Nix & Smith *et al* (2001:5)

¹⁵ Cash flow was considered as one of the key performance indicators and a success factor for the supply chains (SCC, 2008).

These definitions added another dimension to the concept of a supply chain. The progression of the supply chain from the “basic” to the “ultimate” level indicated that a difference existed among the various supply chains with respect to their maturity levels.¹⁶

The term “supply chain” was also applied to a large firm with several sites often located in different countries with a supply network that was defined as a “transnational supply chain”. Stadtler & Kilger (eds.) (2007), from a supply chain perspective, identified co-ordinating information and material flows for such a multinational firm in an efficient manner as the key to success for competing supply chains. This brought yet another dimension to the concept of a supply chain, indicating that supply chains (not businesses) compete with one another. The aspect of competing supply chains was studied in further detail later in this thesis.

Despite the popular usage of the term “supply chain” both in practice and academia, a clear definition for the term could not be obtained. As can be seen from the definitions discussed above, the term “supply chain” was interpreted as having different meanings according to its different usages and applications. For research purposes, this thesis used the following definition of the term “supply chain”:

¹⁶ The aim of supply chains was identified to achieve the ultimate level status by linking all the supply chain entities (including the ones external to the organisation) involved with such activities as procurement, transport, receiving, warehousing, inventory management, materials handling, order processing, distribution, recycling, information processing and payment.

“The linkage of strategic, tactical and operational activities dealing with the flow of goods, information, money and services between the supplier’s supplier and the customer’s customer for an organisation.”

The above definition focused on the elements of activities (across planning levels)¹⁷ and the various kinds of flow possible and linked all the different entities involved (suppliers, customers and the organisation).

It was also clear that the term “supply chain” could not be defined adequately unless it was analysed at a lower level. All the components of a supply chain needed to be understood in order to define the term comprehensively.

2.1.2 Components

Stevens (1989) identified the need for an integrated supply chain (hence integrated components), which he saw as a connected series of activities concerned with planning, controlling and co-ordinating materials, parts and finished goods from supplier to customer in order to achieve organisational success. Stadtler & Kilger (eds.) (2007) identified a supply chain as the seamless information and material flow among three different entities; the customer, the manufacturer and the supplier. Figure 2-2 depicts these components of the supply chain.

¹⁷ The planning levels are discussed in section “2.2.2 – FMCG supply chains”.

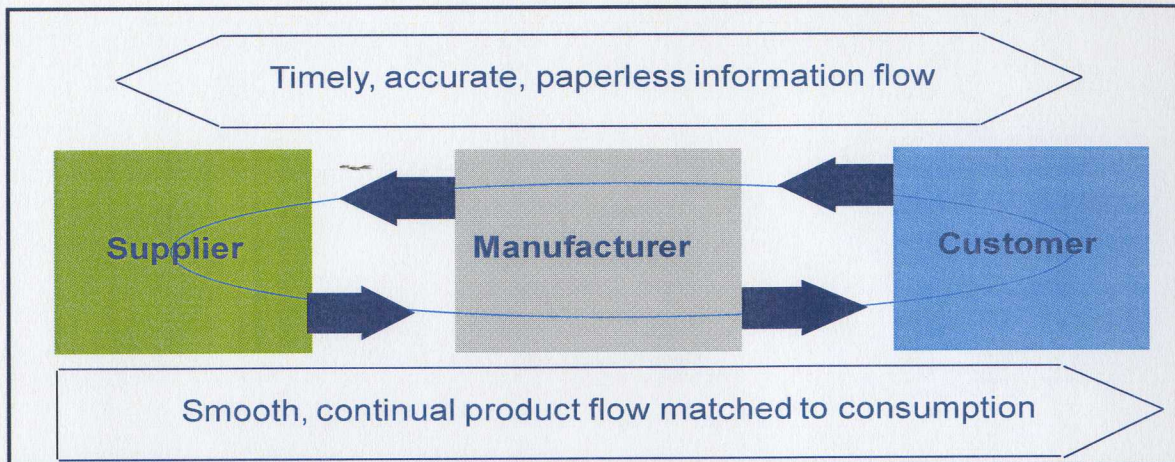


Figure 2-2: Components of supply chain

Source: Adapted from Stadtler & Kilger (eds.) (2007:25)

The flow (material and information), physical entities (suppliers, manufacturers and customers) and extended model (third-party logistics, management parties, financial houses, policy departments and government regulations) were the key components constituting a supply chain.

The supply chain was studied (for analysis and management) by categorising it into the following functional components, as identified by Saxton (2006:30) and SCC (2008):

- a. planning: an end-to-end planning cycle to manage resources
- b. sourcing: choosing suppliers, the buying function and evaluation
- c. making: the manufacturing of products
- d. delivering: the warehousing and transportation of finished products
- e. returning: excess and defective products received back from customers.

As discussed above, most of the authors identified the components¹⁸ of the supply chain as:

“The supplier, the manufacturer (the organisation) and the customer.”

For research purposes, this thesis used the above basic components of the supply chain and the following business functions of the supply chain:

“Planning, sourcing, making, delivering and returning.”

Once the term “supply chain” was defined and its components identified, it was necessary to understand its role in an organisation.

2.1.3 Role of a supply chain

Drucker (1964) emphasised the importance of physical distribution (i.e. the supply chain) and stated that it was always a central and essential feature of all economic activities. Shapiro & Heskett (1985) agreed with this and pointed out that there were only a few aspects of human activity that did not ultimately depend on the flow of goods from point of origin to point of consumption. Seifert (2003) spoke about utilising a supply chain as the backbone needed to create competitive advantage on a global platform. Poirier & Quinn (2003) stated that 98 percent of firms considered SCM to be either critical or very important.

Goldratt & Cox (2004) stated that fulfilling the aim of organisations – to make money – enabled them to thrive in competing economies. Supply chains provided

¹⁸ The extended supply chain model included such additional components as “supplier’s supplier” and “customer’s customer”. Those were represented in the model by the components “supplier” and “customer” respectively.

a platform for organisations to reach their goals by aligning and optimising various value-adding tasks such as production, sourcing and distribution. Furthermore, an organisation's goals were achieved by eliminating non-value-adding tasks such as unnecessary transportation.

Christopher (2005) also confirmed supply chains as the backbones of organisations. He stated that firms used to compete in the past; however, in future, chains linking all the components together will compete. The focus has moved from a reactive cost perspective to a proactive performance perspective. Figure 2-3 represents the difference between the past and the future of the competing economy.

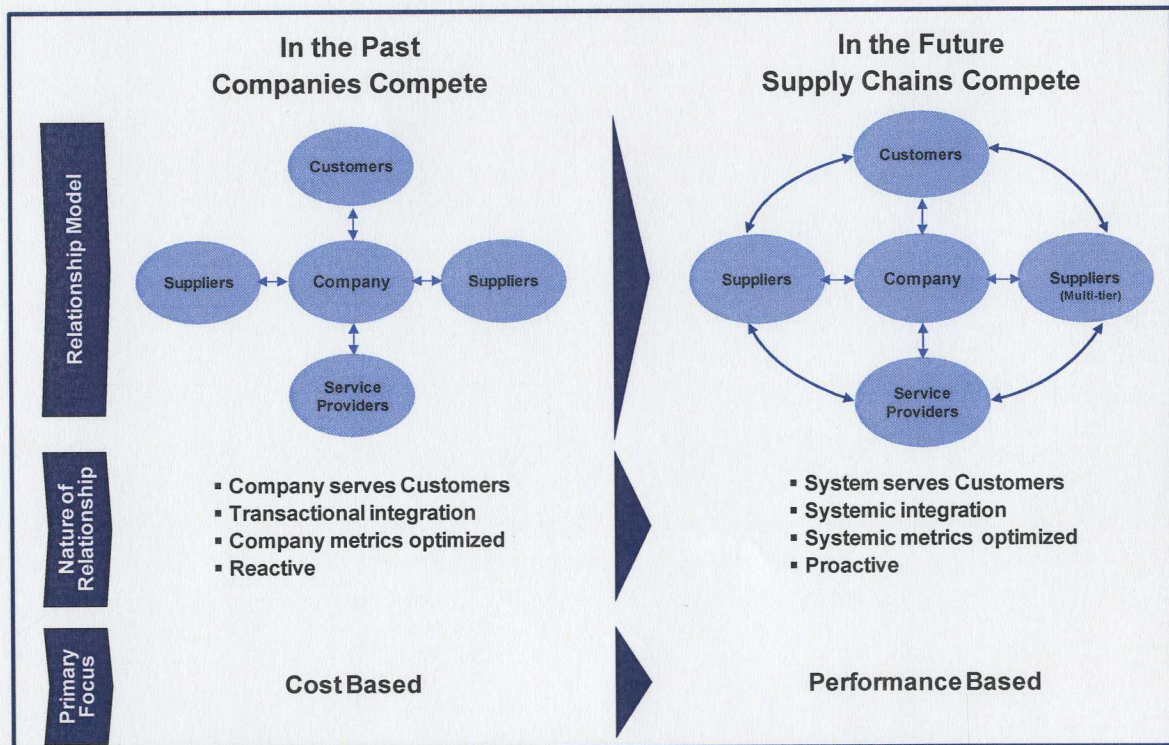


Figure 2-3: Supply chains: past and future
Source: Adapted from Christopher (2005:37)

Supply chains also aligned themselves to support an organisational goal. The goal of a supply chain was competitiveness or, ultimately, customer service (Sahay,

