Chapter – 4

Review of the literature
Supply Chain Management

SCM, as we envision, is a novel management philosophy that recognizes that individual businesses no longer compete as solely autonomous units, but rather as supply chains. Therefore, it is an integrated approach to the planning and control of materials, services and information flows that adds value for customers through collaborative relationships among supply chain members. It is a sound concept, turning idea into practice is by no means an easy task and, thus, it has so far received more lip service than accomplishment, except in a few leading-edge companies (Leenders et. al. 2002). The complex network of interrelated activities in supply chains makes it challenging for managers to describe and comprehend how those activities are related and how they influence each other. Increasing global cooperation, vertical disintegration and a focus on core activities have led to the notion that firms are links in a networked supply chain. This strategic viewpoint has created the challenge of coordinating effectively the entire supply chain, from upstream to downstream activities.

The main question in supply chain management is what would constitute the domain of the supply chain management as a management discipline. According to Malhotra (1999) supply chain management should be seen as a discipline in much the way as marketing and has been seen as contentious. But Long and Dowells (1989) argue that “…disciplines are distinguished by the general (discipline) problem they address” (cited in Tranfield and Starkey, 1998). According to Simon et.al. (2000), the scientific development of a coherent SCM discipline requires advancements in the development of theoretical models to further enhance our understanding of the supply chain phenomena. Their analysis confirms that the area is devoid of clear theory. In particular, the relative importance and interrelationships of various supply chain initiatives and constructs, as well as the direct or mediating effects of these activities and constructs on supply chain performance have been hardly explored and, thus, are not well understood.

While supply chains have existed ever since businesses have been organized to bring products and services to customers, the notion of their competitive advantage, and consequently the supply chain management (SCM), is a relatively recent thinking in management literature. Although research interests in and the importance of SCM are growing, scholarly materials remain scattered and disjointed, and no research has been directed towards a systematic identification of the core initiatives and constructs involved
The origins of the notion of supply chain management are unclear, but its development appears to start along the lines of physical distribution and transport (Croom et al. 2000), based on the theory of Industrial Dynamics, and derived from the work of Forrester (1961). In 1963, Mallen developed the organizations extension theory, a theory within a marketing framework and advocating extending the organization to include all members of the distribution channel. SCM advocates a similar approach but takes a production view. Another antecedent can be found in the total cost approach to distribution and logistics (Heckert and Miner, 1940; Lewis, 1956). Both approaches show that focusing on a single element in the chain cannot assure the effectiveness of the whole system (Croom et al. 2000). The term ‘supply chain management’ was originally introduced by consultants in the early 1980s (Oliver and Webber, 1992) and has subsequently gained tremendous attention (La Londe, 1998). Articles specifically about SCM began to appear in the late 1980’s (Tyndall, 1988; Stevens, 1990) as the focus on opportunities for competitive advantage began shifting from inside the manufacturing plant to relationships with suppliers and then to closer relationship with the customers. SCM is relatively new; the precise definition is therefore still evolving.

The supply chain management landscape

In providing the topology of supply chain landscape we support (New, 1995) and (Saunders, 1995) contention that within the supply chain management literature there is a confusing profusion of overlapping terminology and meaning. As a consequence, in the literature many labels can be found referring to the supply chain and to practices for supply chain management, including integrated purchasing strategy, Supplier integration, (Dyer et al. 1998), Buyer-supplier partnership (Lamming, 1993), Supply base management, Strategic supplier alliances, Supply chain synchronization, Network supply chain, ( Tan et al. 1998), Value-added chain, Value stream (Lee and Billington, 1992), Lean approach (New and Ramsay, 1995), Supply pipe line management (Farmer and Van Amstel, 1990).

Following are some of the definitions associated with the concept of supply chain management found in the literature analyzed. It is not intended to provide a comprehensive review of the definitions; rather the purpose here is to highlight some of the contrasting approaches to supply chain management and common aspects, in order to better trace the boundaries of the concept and to highlight the difficulties of its definitions.
Supply chain management encompasses materials/supply management from the supply of the basic raw materials to final product (and possible recycling and re-use). Supply chain management focuses on how materials utilize their suppliers’ processes, technology, and capability to enhance competitive advantage. It is a management philosophy that extends traditional intra-enterprise activities by bringing trading partners together with the common goal of optimization and efficiency, Tan et. al. (1998).

Supply chain management aims at building trust, exchanging information on market needs, developing new products, and reducing the supplier base to a particular OEM (original equipment manufacturer) so as to release the management resources towards developing a meaningful, long-term relationship, Berry et. al. (1994).

An integrative approach in dealing with the planning and control of the materials flow from suppliers to end users, Jones and Riley (1985).

External chain is the total chain of exchange from the original source of raw material, through the various firms involved in extracting and processing raw materials, manufacturing, assembling, distributing and retailing to the ultimate end customers, Saunders (1995).

A network of firms interacting to deliver product or service to the end customer, linking flows from raw material supply to final delivery, Ellram (1991).

Network of organizations that are 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 the ultimate consumer, Christopher (1992).

Networks of manufacturing and distribution sites that procure raw materials so as to transform them into intermediate and finished products and distribute the finished products to the customer, Lee and Billington (1992).

The set of entities, including suppliers, logistics service providers, manufacturers, distributors and resellers, through which the materials, products and information flow, Kopezak (1997).

A network of entities that starts with the suppliers’ supplier and ends with the customers’ customer, the production and delivery of goods and services, Lee and Ng (1997).

• Integrated supply chain management is defined as: "the alignment of buyers, suppliers, and customers and their processes to achieve an advanced form of competitive advantage," Morgan (1997).

• Supply chain structure is defined as: "the organizational efforts by three or more firms to manage and integrate material and related information flows in order to get closer to customers," Morash and Clinton (1997).

One of the reasons for the lack of universal definition of supply chain management is in part due to the way the concept of the supply chain has been developed. The concept of supply chain has been considered from the different points of view in the different bodies of the literature. Such multi-disciplinary origin and evolution is reflected in the lack of robust conceptual framework for the development of the theory on supply chain management. As a consequence the schemes of interpretation of the supply management are mostly partial or anecdotal with a relatively poor supply of empirically validated models explaining the scope and form of supply chain management, its costs and its benefits. This literature review is intended to provide a description and synthesis of the studies impacting in the development of the supply chain management.

The popularity of the supply chain concept has been stimulated from many directions including the quality revolution (Dale et. al. 1994), notions of materials management and integrated logistics (Carter and Price 1993), a growing interest in industrial markets and networks (Ford 1990, Jarillo 1993), the notion of increased focus (Porter 1987, Snow et al. 1992), and influential industry-specific studies (Womack et al. 1991; Lamming, 1993). Thus, researchers find themselves inundated with a plethora of terminology including ‘supply chains’, ‘demand pipelines’ (Farmer and Van Amstel ,1991), ‘value streams’ (Womack and Jones, 1994), ‘support chains’, and many others.

Analytically, a typical supply chain is simply a network of materials, information and services processing links with the characteristics of supply, transformation, and demand. The term ‘supply chain management’ has not only been used to explain the logistics activities and the planning and control of materials and information flows internally within a company or externally between companies (Christopher, 1992; Cooper et. al. 1997b; Fisher, 1997). Researchers have also used it to describe strategic, inter-organizational...
issues (Harland et. al. 1999), to discuss an alternative organizational form to vertical integration (Thorelli, 1986), to identify and describe the relationship a company develops with its suppliers (Helper, 1991; Narus and Anderson, 1995), and to address the purchasing and supply perspective (Morgan and Monczka, 1996).

Various subject areas such as purchasing and supply, logistics and transportation, marketing, organizational behaviour, network, strategic management, management information systems and operations management have contributed to the explosion of SCM literature. From the myriad of research, it can be seen that a great deal of progress has been made toward understanding the essence of SCM. The new orthodox of SCM, however, is in danger of collapsing into a discredited management fad unless a reliable conceptual basis is developed (New, 1996), and many authors have highlighted the pressing need for clearly defined constructs and conceptual frameworks to advance the field (New, 1995; Saunders, 1995, 1998; Cooper et. al. 1997a; Babbar and Prasad, 1998).

The growing importance of SCM has engendered a myriad of disjointed research dispersed across many disciplines. Saunders (1995) warns that pursuit of a universal definition may “lead to unnecessary frustration and conflict”, and also highlights the fragmented nature of the field of supply chain management, drawing as it does on various antecedents including industrial economics, system dynamics, marketing, purchasing and inter-organizational behaviour.

**Matching the supply chain to market and environmental circumstances**

have predictable demand and low margins; innovative products have unpredictable demand and higher profit margins. Functional products require supply chains that are efficient in performing the physical function while, innovative products require chain responsive in performing the marketing mediation function. Fisher's frame work was supported by the findings of Morash and Clinton (1997); Dyer, Cho and chu (1998).

**The consumer is setting the agenda for the entire food system.**

In the twenty-first century customers and suppliers cannot be taken as independent entities; they form an integral part of the network. There are several players involved in fulfilling the needs of the consumer, viz., farmers, traders, transporters, processors, retailers, etc. Supply chain management is a task of integrating the organizational units along a supply chain in order to fulfil the customer demands with the aim of improving the competitiveness (Stadtler and Kilger, 2000). If the supply chain is not managed properly, then the delivery chain automatically gets affected resulting in customer dissatisfaction and loss of business (Sahay, 2000).

In the past, companies were looking at solving the distribution problem through maintaining inventory at various locations throughout the chain. However, the dynamic nature of the market place makes holding inventory a risky and potentially unprofitable business. Customers' buying habits are constantly changing and the competitors are constantly adding and deleting the products and hence the consumer is setting the agenda for the entire food system. Consumer demands are transmitted from food retailers to wholesalers and processors and ultimately back to the farmers. The industry has become consumer-driven (Wim and Luuk, 2005). Producers, who traditionally did not have to worry about where or how their product was delivered to the consumer, now need to be very aware of the impact that their actions have on the marketability of the final product.

As a result, new food products are 'market-tailored'. They take on a more industrialized nature through differentiation and season-independent supplies. Simple food systems are transformed into long and complicated international agri-food chains. The tendency towards increased consumer-orientation entails consequences for agri-food producers. Since many of them are located in developing countries, the current trend warrants the attention of development economists.

Small-scale developing country farmers should receive special attention, because they tend to be the poorest and most vulnerable chain actors. As changes in developed country
consumers' preferences work their way back through the chain, these affect farmers in developing countries as well.

Commodity chains are broadly defined by Gereffi and Korzeniewicz (1994) as 'sets of inter-organizational networks clustered around one commodity or product, linking households, enterprises within the economy'. The goal of Commodity chain analysis is to trace a particular commodity from its incipient raw material stage towards its final consumption, in order to estimate or predict the generation of added value and its distribution among the different participants in the chain.

An important aspect of Commodity chain analysis is the identification of the nature of governance structure or 'driving force' in commodity chains. Who and where is the main coordinating and organizing actor of the different activities within a chain and how does it behave?

**Shifting preferences in food consumption**

In order to trace the ramifications of a more consumer-oriented food system, we first need to take a closer look at consumer preferences, as they constitute the starting point of agri-food chains. Food products may gratify several human needs, both physiologically and psychologically. With regard to physiological needs, food reduces hunger by providing the consumer with bodily energy through its nutritional value. Besides being 'fuel' for the human body, food is also consumed for the organoleptical or sensory pleasures it creates, i.e. taste, smell, colour, and texture. Moreover, food should at least satisfy minimal health requirements (food safety).

Some food researchers have made an attempt to rank the various consumer needs that food may gratify in analogy to the well-known hierarchy-of-needs developed by Maslow (1954), which consumers are supposed to climb as their income goes up. At the bottom of the needs pyramid figures 'nutrition', as it is directly related to physiological deprivation (hunger), and therefore a so-called 'lower-order' need.
Figure No. 4.1 Hierarchy of needs with respect to food

When survival is guaranteed and income levels rise above subsistence, other needs like taste, health, convenience, novelty, status, and ethics come into play. This results in a needs pyramid depicted in Figure 4.1. Figure 4.1 implies that consumers spend a declining share out of their food budget on nutrition as they grow richer. This accords well with an empirical regularity in food research known as Bennett’s law, which states that food expenditure increases faster than food quantity (measured in terms of nutritional intake) under rising incomes, which is caused by a switch from low-priced foods to more expensive, higher-quality foodstuffs). Although it seems indisputable that minimal nutritional requirements have to be met first in order to ensure bodily survival, it does not mean that the low-income consumers only become interested in higher-order characteristics as soon as their nutritional needs are fully satisfied. As Maslow himself acknowledges, higher-order needs may come into play even before lower-order needs are gratified a full hundred per cent (Maslow, 1954). Certain groups of poor consumers, especially in urban areas, may be willing to pay for higher-order characteristics such as status due to demonstration effects. The mirror image may also hold true. Some affluent consumers may be interested mainly in low-income characteristics (e.g. those who are part of voluntary simplicity movements). Despite this group of ‘down shifters’, however, it seems reasonable to assume that the higher the income of a consumer, the lower the
proportion of total food expenditure used to procure basic nutrition. Although the human body is quite tolerant to overeating, i.e. there is relatively little physiological resistance to an over-supply of energy, utility gains of increased nutrition are likely to decrease beyond a certain point, especially in the Western world where dietary concerns prevail, and may even become negative as an excessive intake of calories starts causing health problems in the form of obesity (Steenkamp, 1997). Consequently, consumers’ willingness-to-pay for nutrition decreases relative to their willingness-to-pay for higher-order needs. Since the final consumer is the ‘ultimate’ buyer of the chain output, changes in food consumption patterns are increasingly shaping global agri-food production. Consumption therefore deserves a more central place in food supply chain analysis.

**Figure No. 4.2: Consumer as the main actor in setting the agenda for entire food system**

![Diagram showing the supply chain with arrows pointing from procurement to production, then to distribution, and finally to the consumer. Arrows from the consumer to ethics, status, novelty, convenience, health, taste, and nutrition.]

**Value analysis across the supply chain**

The objective of every supply chain is to maximize the overall value generated. The point of origin of any supply chain activity should take into account values that are going to be important at the final consumer market, (Wilson and Jantrania, 1995). The value is directly correlated with the success of a supply chain. The value a supply chain generated is the difference between what the final product is worth to the customer and the efforts supply chain expends in fulfilling the customers’ request.

Value analysis will help to unlock the trapped value by creating either more efficient markets or more efficient value systems. It is possible to create more efficient market by lowering the search and transaction costs, as well as more efficient value systems by compressing or eliminating steps in a current value system through either saved time or cost. Hence, an attempt to reconfigure the existing value chain will release the trapped value and companies can look to create new-to-the-world benefits. These new benefits can
enhance an existing offer or become the basis for a new offer, (Rafi et.al, 2003).

The rationale for discussing the value analysis in supply chain management is that, as the speed of change in the marketplace increases, the collaboration and coordination costs of the supply chain will increase.

To stay competitive, it is essential to supply chain integration process to improve business value. Value analysis helps us to understand the connection to the other actors in the chain. It addresses the question: Who adds value and where along the chain? The value chains are not just strings of market relations where buyers and sellers act freely. Often there are powerful actors in the chain who pull the strings and control the flow of goods and information. Value analysis helps to identify pressure points and improve the situations in weaker links, where returns are low.

**Value system**

A value system is an inter-connection of processes and activities within and among the firms that create benefits for the intermediaries as well as the end consumers. Value is created from the first inputs through to the end: customer purchase, usage, and disposal activities.

A value system thus, becomes the anchor to identify and investigate whether all the channel partners are either capable or are delivering the value enhancing activities and also to frame opportunities that will create them. Firms should look at the value system as a lens that yields ideas about the new business opportunities. The starting point for opportunity identification is to identify (map) the arena in which the companies are participating. The objective is to investigate and declare what is in and what is out. The business arena is made up of discrete collections of individual and organizational activities that work together to create and deliver customer value via products and services. These integrating activities describe the value chain.

Within the firm there may be ways to create value. After all the firm is made up of a series of connected activities that result in the creation of an end product or the delivery of a service. From purchasing inputs to manufacturing, to marketing and sales, to product delivery, to after-sales support, all these activities make up a value chain that is contained within the company. In addition, there are supporting activities necessary to ensure a company’s viability, from financial planning and control to employees recruiting and training, to research and development. Just as many of these activities are interconnected
within one company, there are also connections with other companies or consumers. Both
the activities within a firm (value chain) and those connecting firms with other firms and
customer (Value system) are potential candidates for value creation.

Value chain

The value chain describes the full range of activities which are required to bring a product
or service from conception, through the different phases of production (involving a
combination of physical transformation and the input of various producer services),
delivery to final consumers, and final disposal after use. Value Chain Analysis of food
processing industries helps to understand how each unit creates customer value by
examining the contribution of different activities within the business that value. It divides
the activities within the firm into two broad categories, primary and support activities.
Primary activities are those involved in the physical creation of the product, marketing,
and transfer to the buyer, and after sales support. Support activities assist the firm as a
whole by providing infrastructure or inputs that allow the primary activities to take place
on an ongoing basis. The Value Chain include profit margin, since a mark-up above the
cost of providing a firms value-creating value that exceeds cost so as to generate a return
to the effort. The objective is to focus on the cutting edge techniques being used by the
food industry to increase the profitability, accountability, and transparency.

Value chain analysis is important both conceptually and practically. Conceptually, the
value chain approach presents a good picture of the process of creating value. For one
thing, it shows clearly that production is not the only way to create value. A product is
brought to market through a combination of activities, all of which contribute to its final
value. The value chain concept also enhances our understanding of the way trade takes
place today. Research on value chains shows that an increasing amount of international
trade occurs within trading networks. Firms in the networks are formally independent of
one another, but linked by personal relations, repeated transactions, and often dense
information flows. Networks contain firms of many different types, from global buyers to
small local workshops. Perhaps more important to users of this part is the practical
usefulness of value chain analysis as a way to understand problems and find ways of
improving the situation of the “weaker” links in the chain, i.e., those with low returns and
little bargaining power,(Dorothy McCormick, 2001).

Understanding the distribution of gains along the chain: Knowing how and by whom a
chain is governed helps to understand the distribution of gains among firms along it. The ability to govern often comes from strength in particular competences such as design, branding, marketing, which command high returns, but are difficult for developing country firms to acquire. Developing country firms tend to be locked into production activities, in which they manufacture to the specifications of the lead firm. Since many producers are capable of doing this, competition is intense and returns are low.

**SCM-Value chain correlation**

The supply chain is the logistics aspect of a value delivery chain. Within the value chain, the various supply chain partners (from suppliers to manufacturers to wholesalers to retailers to consumer) jointly represent a value delivery system. In supply chain management, all the parties (from suppliers to manufacturers to wholesalers to retailers to consumer) are most apt to be satisfied with their interactions when they have similar beliefs about the value provided and received and agree on the payment for that level of value. From the perspectives of all the parties' concerned, value is embodied by a series of activities and processes – a value chain – that provides a certain value for the consumer. It is the totality of the tangible and intangible product and customer service attributes offered to the customer (Barry, 2006).

Supply chain management has been considered as one of the most popular operations strategies in the twenty-first century for improving organizational effectiveness. The effectiveness of supply chain management depends upon the level of integration between suppliers, partners, and customers that are dispersed all over the world. Supply chain management is the integration and management of supply chain organizations and activities through co-operative organizational relationships, effective business processes, and high levels of information sharing to create high-performing value system that provide the member organizations a sustainable competitive advantage (Sridhar Bhatt, 2008). A Value system is defined as “a connected series of organizations, resources and knowledgeable streams involved in the creation and delivery of value to end customers. Value systems integrate supply chain activities from determination of customer needs through product/service development, production/operations and distribution, including first second and third – tier suppliers (as appropriate). The objective of the Value System is to position organizations in the supply chain to achieve a higher level of customer satisfaction and value while effectively exploiting the competencies of all the organizations in the supply chain. Creating value for customers requires cycle time
reduction. However, without effective organizational relationships among supply chain member organizations, efforts to manage the flow of materials or information across the supply chain are likely to unsuccessful. To increase the value of the output of a process all tasks should be reviewed. Do they all have an added value in the process or are some of them useless or duplicate? In a lot of processes there are superfluous tasks.

The starting point will be to define 'Value' from the point of view of the consumer. Every supply chain is there to serve the final customer, but often chain members do not have either a clear or consistent understanding of the issues that are really important to the end consumer. The general measures of customer value are Quality (Product, Taste, Welfare, and Packaging, etc.), Cost (Price, Promotions) and Delivery (Availability, Merchandising, Range, etc.), (Mark Francis, 2005).

Within the strategic management literature, the concept of value plays a pivotal role in the study of a sustainable competitive advantage. To explain profit differentials between firms one needs to take into account not only the creation of value but also the available means of appropriating this value in a competitive context (Zajac and Olsen, 1993). Within the whole value system, there is only a certain value of profit margin available. The term, 'Margin' implies that organizations realize a profit margin that depends on their ability to manage the linkages between all activities in the value chain. In other words, the organization is able to deliver a product / service for which the customer is willing to pay more than the sum of the costs of all activities in the value chain. This is the difference of the final price the customer pays and the sum of all costs incurred with the production and delivery of the product/service (e.g. raw material, energy, etc.). It depends on the structure of the value system, how this margin spreads across the suppliers, producers, distributors, customers, and other elements of the value system. Each member of the system will use its market position and negotiating power to get a higher proportion of this margin. Nevertheless, members of a value system can cooperate to improve their efficiency and to reduce their costs in order to achieve a higher total margin to the benefit of all of them.

Primary activities of value generation can be organized as Value Creation, Value Addition and Value Protection. Bowman and Ambrosini, (2000) define value creation as the contribution to the utility of the final good to end users. Value Addition is the group of activities in which an organization recoups combination of products and services to create richer product bundles. Foss (2003) noted that in addition to creating and capturing value, firms also deploy resources to protect themselves against the threat of competition.
Governance of value chain

Governance is the act of governing or controlling the inter-firm relationships between various segments of members within value chains, (John Humphrey and Hubert Schmitz, 2001). It is quite easy to point to instances of governance in inter-firm relationships within value chains. These requirements are enforced through a system of auditing and inspection and, ultimately, through the decision to keep or discard a supplier.

The literature by Gereffi (1994), shows that many chains are characterized by a dominant party (or sometimes parties) who determine the overall character of the chain, and as lead firm(s) become responsible for upgrading activities within individual links and coordinating interaction between the links. This is a role of ‘governance’, and here a distinction is made between two types of governance: those cases where the coordination is undertaken by buyers (‘buyer-driven commodity chains’) and those in which producers play the key role (‘producer-driven commodity chains’).

Setting the parameters for value chain governance

Governance in value chains has something to do with the exercise of control along the chain. At any point in the chain, the production process (in its widest sense, including quality, logistics, design, etc.) is defined by a set of parameters. The four key parameters which define what is to be done and what are to be produced? How it is to be produced? This involves the definition of production processes, which can include elements such as the technology to be used, quality systems, labour standards, and environmental standards. When it is to be produced? How much is to be produced? To these four basic parameters one might add a fifth parameter, price. In short, governance refers to the inter-firm relationships and institutional mechanisms through which non-market co-ordination of activities in the chain is achieved. Governance, in the sense of arrangements that make possible the non-market coordination of activities, is not a necessary feature of value chains. Many goods are traded in markets through a series of arm's-length market relationships between firms. The parameters are defined solely by each firm at its point in the chain. So, for example, a firm might make a product according to its own estimations of market demand ("make to forecast"), using a design that has no reference to any particular customer (i.e. either a completely standard product, or a product developed in-house) and using its own processes. There are various ways in which inter-firm relationships can differ from this pattern. For example, the decisions about "when" and
"how much" will be made jointly by the producer and the buyer when production is scheduled according to "make-to-order" rather than "make-to-forecast". This is typical when products have many possible variants, which renders make-to-forecast uneconomic.

From the point of view of the analysis of inter-firm linkages in the global economy, the critical parameters for value chain governance are the first two: what is to be produced, and how it is to be produced. These parameters are often set by buyers. In some cases, the buyer may merely refer to the process standards to be attained. In other cases, the buyer will specify precisely how particular standards should be attained by requiring and perhaps helping to introduce particular production processes, monitoring procedures, etc. When the buyer plays this role, we refer to it as the "lead firm" in the chain. The fact that this lead role can be played by a variety of firms leads to Gereffi's distinction between producer-driven and buyer-driven global value chains (Gereffi, 1994). In producer-driven chains, the key parameters are set by firms which control key product and process technologies - for example in the car industry. In buyer driven chains, the key parameters are set by retailers and brand-name firms who focus on design and marketing, not necessarily possessing any production facilities.

Product and process parameters can also be set by agents external to the chain, as has been argued by Kaplinsky, (2000). Government agencies, Institutional organizations, International organizations regulate product design and manufacture, not only with a view to consumer safety, but also in order to create transparent markets (for example, by defining standard weights and sizes or technical norms). Examples of such parameter setting by agents external to the chain include food safety standards, norms with regard to the safety of products such as children's toys, electrical equipment, and motor vehicles and control of hazardous substances in a wide range of products. Once again, these norms can refer to the product (are its physical characteristics and design in conformance with requirements?) or to the process (is it being produced in ways which conform to particular standards?). In some cases, process norms are pursued as a means to achieving product standards (for example, hygienic food preparation systems are designed to produce safe food) and in others because of the intrinsic value of particular types of processes (for example, animal welfare requirements). Governments may set standards which are compulsory and have legal force.

Standards may also be set by non-legal agreements (code of conduct, etc.) and by a variety of unofficial agencies, such as NGOs, which pressure for compliance with labour and
environmental standards.

Parameters set from outside the chain lead to chain governance when one agent in the chain enforces the compliance with parameters of other agents or translates the parameter into a set of requirements which it then monitors and/or enforces. This situation usually arises when agents at one point in the chain might be held responsible for actions by agents (or the consequences of these actions) at other points in the chain. The UK Food Safety Act, for example, places upon food retailers a requirement for "due diligence" with respect to the manufacture, transport, storage, and preparation of food. They can be held liable for not serving food fit for consumption. U.K. supermarkets have developed systems of traceability and monitoring, to meet the industry requirement. Lead firms of the chain "undertake the functional integration and coordination of various dispersed activities" (Gereffi, 1999). The producers that gain access to the chains' lead firms tend to find themselves on a steep learning curve. The lead firms are very demanding with regard to reducing cost, raising quality and increasing speed (and are therefore unpopular with the local workforce). But they also transmit best practices and provide hands-on advice (and pressure!) on how to improve layout, production flows, and raise skills. It is this combination of high challenge and high support which is often found in the highly governed chains However, there is also recognition that the governance structures which facilitate the fast acquisition of production capabilities can create barriers for the acquisition of design and marketing capabilities (Schmitz and Knorringa, 2000).

Understanding the governance of a chain helps to understand the distribution of gains along the chain. Kaplinsky (2000), in particular, suggests that the ability to govern often rests in intangible competences (R&D, design, branding, and marketing) which are characterized by high barriers of entry and command high returns – usually reaped by developed country firms. In contrast, developing country firms tend to be locked into the tangible (production) activities, producing to the parameters set by the 'governors', suffering from low barriers of entry and reaping low returns.

The basic rules which define the conditions for participation in the chain need to be set. In the past, these rules were largely concerned with meeting basic cost parameters and guaranteeing supply, but increasingly as Japanese management practices spread during the 1990s, the critical success factors came to include what is known as “QPD” (that is quality, price and delivery reliability). More recently, the “rules” of participation have increasingly come to include conformance to international standards such as ISO9000 (on
quality), ISO14000 (on environment), SA8000 (labour standards) and other industry-specific standards such as phyto-sanitary and HACCP (hazard analysis and critical control point) in the food processing industry. The definition of these various sets of rules as defining the basis of participation in value chains can be termed ‘legislative governance’, i.e. setting the parameters governing the value chain. But it is also necessary to audit performance and to check compliance with these rules – this can be seen as ‘judicial governance’, i.e. coordinating the conformance to the set parameters. However in order to meet these rules of participation, there needs to be some form of proactive governance (which might be termed ‘executive governance’) which provides assistance to value chain participants in meeting these operating rules, i.e. managing the various subordinate links in the value chain. This executive governance may be direct (helping a supplier achieve quality standards for example) or indirect (forcing a first-tier supplier to assist a second-tier supplier, or introducing a supplier to a service sector firm which can assist it in meeting the standards which are required). These governance roles may be provided by producers in the chain (that is, from within) or by parties external to the chain (that is, from without). But, in reality it is seldom the case that the three functions are in fact performed by the same firm, which is one of the reasons why the supply chain literature has difficulty in explaining the prevalence of value chain inefficiency in the real world.

**Emerging trend in chain governance**

Brands play an increasingly important role in enterprise strategy, particularly in consumer products. The enormous investment required to create (or maintain) brands is being increasingly made by retailers or other companies which have no (or only limited) production facilities of their own. Product and process definition, however, is a strategic part of their operation. This tendency is already evident in parts of the Italian footwear industry (Rabellotti, 2001). Brands stand for high quality or well-defined images, they need to define and enforce product and process parameters. Branding and chain governance thus tend to go together. Chain governance is not however limited to the sourcing of branded products.

**The role of lead firm in value chain governance**

A chain without governance would just be a string of market relations. Instances of governance are easy to describe. The lead firms of chains become the entry point for reaching out to a multitude of distant small and medium sized suppliers. It is recognized,
however, that some buyers may require ‘mentoring’ in order to fulfil this funnel and transmission function. Lead firms of the chain "undertake the functional integration and coordination of internationally dispersed activities" (Gereffi 1999). Decisions by the chains’ lead firms may lead to particular types of producers and traders losing out. Those producers that gain access to the chains’ lead firms tend to find themselves on a steep learning curve. The lead firms are very demanding with regard to reducing cost, raising quality and increasing speed (and are therefore unpopular with the local workforce). But they also transmit best practices and provide hands-on advice (and pressure!) on how to improve layout, production flows, and raise skills. It is this combination of high challenge and high support which is often found in the highly governed chains and which explains how relatively underdeveloped regions became the major 3 export producers in a short period of time. The Brazilian shoe industry in the early 1970s and the Vietnamese garment industry in the late 1990s are good examples.

**Value chain upgrading across supply chain**

It is possible to identify four trajectories which firms can adopt in pursuing the objective of upgrading, namely, process upgrading-increasing the efficiency of internal processes such that these are significantly better than those of rivals, both within individual links in the chain, product upgrading-introducing new products or improving old products faster than rivals, functional upgrading-increasing value added by changing the mix of activities conducted within the firm or moving the locus of activities to different links in the value chain, chain upgrading-moving to a new value chain(Gereffi 1999).

**Behavioural aspects of buyer-seller relationships**

According to a report by Deloitte Consulting (1999), “no longer will companies compete against other companies, but total supply chains will compete against other supply chains.” Setting up the supply chain network and managing it in an optimized way, balancing customer needs with increased performance along the whole supply chain network, may be a key factor for the competitiveness of a company. There is an increasing interest in exploring the opportunities for competitive advantage that arise from reinforcing core competencies and innovative capabilities of the individual companies, and by forming integrated supply chain networks. The literature on supply chain networks recognizes the critical importance of intense inter-firm relationships for their competitiveness (Gulati, 1998). Advances in information technology may now enable
firms to build partnerships and re-engineer business processes to coordinate in an effective way to optimize supply chain operations (Tamer Boyaci and Guillermo Gallego, 2004).

Cunningham, (1980) investigates the behavioural complexities between seller and buyer and how these are associated with operating performance. One way to cope with the above problems is by adopting a relational perspective in studying marketing phenomena (Ford and Leonidou, 1991, Styles and Ambler, 1994, Leonidas and Kaleka, 1998). This approach underscores the fact that both seller and buyers are equally active in distribution business, and that distribution can best be understood by studying the factors shaping the organizational interaction between the two parties involved. In essence, relational research in distribution could be beneficial in a number of ways, such as: revealing that a seller has a portfolio of multi-episodic relationships with buying customers; unveiling the dynamics of the atmosphere underlying marketing exchanges in markets; and finding the right mix of behavioural factors that are linked to success in national markets. Hence, relational studies enable the contractual and contractual relationships between seller and buyer, which provide the essence of modern marketing, to be better understood and adequately manipulated (Reid, 1983).

Coordination and Cooperation across the supply chain

Co-ordination is an orderly arrangement of group efforts to provide unity of direction and unity of action in the pursuit of common goals or objectives, (Sridhar Bhatt, 2008). The coordination of participants along the supply chain is becoming increasingly important. For the success of any supply chain network, the innate cooperative spirit is a precondition. A cooperative or close relationship refers to the process of working together, over an extended period of time, for the benefit of both firms. Moreover, a short-term oriented adversarial buyer-supplier relationship is not consistent with the long-term corporate level strategic planning (Cooper and Ellram, 1997a). Increasing global cooperation, vertical disintegration and a focus on core activities have led to the notion that firms are links in a networked supply chain. This strategic viewpoint has created the challenge of coordinating effectively the entire supply chain, from upstream to downstream activities, (Chen and Paulraj, 2004).

Trust and commitment in buyer-seller relationship

Behavioural aspects of buyer-seller relationships is still in the early stages of theory advancement, with a long way to go before reaching maturity, thus making difficult, if not
hazardous, the development of a solid conceptual framework. Instead, it would be more appropriate to provide an in-depth analysis of the limited number of studies conducted on the subject and make some general inferences (Leonidas and Kaleka, 1998). Supply chain management is built on a foundation of trust and commitment (Lee and Billington, 1992; Kumar, 1996). Trust contributes significantly to the long-term stability of the buyer-supplier relationship (Handfield and Bechtel, 2002). Committed partners also dedicate resources to sustaining and furthering the goals of this relationship. Thus, buyer-supplier relationships enforced by strategic purchasing and based on trust and commitment foster sharing of information ranging from R&D to product design and production plan. With higher levels of trust and commitment, relationship partners share a common vision of the future, recognizing that their long-term success is only as strong as their weakest supply chain link. Researchers also note that the strategic nature of purchasing reflects its integrative role (Freeman and Cavinato, 1990; Gadde and Snehota, 2000). The conceptual re-description of purchasing as integration of internal and external exchange functions, therefore, illustrates that it is conducive and instrumental to supply network coordination and enterprise-wide logistics integration. Similar to the three SCM external driving forces, strategic purchasing, serves as an internal driving force for supply management.

Cooperation, whereby firms exchange bits of essential information and engage some suppliers-customers in longer-term contracts, has become the threshold level of supply chain interaction. SCM is built on a foundation of trust and commitment (Lee and Billington, 1992; Kumar, 1996). The consensus is that trust can contribute significantly to the long-term stability of an organization (Heide and John, 1990; Handfield and Bechtel, 2002). Trust is conveyed through faith, reliance, belief or confidence in the supply partner and is viewed as willingness to forego opportunistic behaviour. Trust is one's belief that one's supply chain partner will act in a consistent manner and do what he/she promises. It is the sense of performance in accordance with intentions and expectations that hold in check one's fear of self-serving behaviour on the part of the other members of the supply chain. Commitment implies that the trading partners are willing to devote energy to sustaining this relationship (Dion et al. 1990). That is, committed partners dedicate resources to sustaining and furthering the goals of the supply chain. To a large degree, commitment makes it more difficult for partners to act in ways that might adversely affect overall supply chain performance. With commitment, supply chain partners become integrated into their major customers' processes and more tied to their goals. A high level
of inter-organizational trust is found to be related to enhanced supplier performance, lowered costs of negotiation and reduced conflict (Zaheer et al. 1998). Kenworthy (1997) views that apart from innate to propensity to co-operate he argues that, institutions can be constructed on the basis of purely economic incentives. David, et.al. (2005) observes Trust-building in food supply chains appears particularly problematic due to the volatile prices associated with commodity markets, isolation of farmers from markets, and size imbalances between the various actors.

Historically, supply chain relationships are based on either on power or on mutual trust. In power-based relationship, the stronger participants dictates its view to the other. Exploiting power may seem to be beneficial in the short-term, but has negative consequences in the long-term. Because, when the power is exploited by one stage of the supply chain, it usually uses power to maximize its profits at the expense of the other stages resulting in decreased total supply chain profits.

**Relationship marketing and its inadequacy**

Business-to-business exchange literature has over the last twenty years focused on the move away from individual transactional exchanges to a relational approach and this is well documented, for example, in Berry, 1983; Gummesson, 1999; Sharma and Sheth, 1997; Fournier et al. 1998; Parvatiyar and Sheth, 2000; Webster, 1992 and Grönroos, 1994. Described is the move from arms length dealings to partnering (Araujo et al. 1999) and from adversarial to relational exchange (Kalafatis, 2000).

**Relationship marketing**

Relationship marketing is sourced from an eclectic mix of influences, not only from academics in marketing and management disciplines but also from practitioners in business organizations (Brodie, et al. 1997; Buttle, 1996; Sheth and Parvatiyar, 2000). RM is based upon social exchange and perpetuation of ongoing, long-term mutual beneficial relationships through collaboration (Gummesson, 1996; Palmer 1994; Dodge and Fullerton, 1997). For some, the concept seeks to operationalise the acknowledged view of marketing and concerns servicing and satisfying existing customers through long-term, close, interactive and collaborative relationships, networks and interactions that are mutually beneficial and profitable (Berry, 1983; Dodge and Fullerton 1997; Jüttner and Wehrli, 1994; Palmer, 1994; Sheth and Parvatiyar, 1995).
A significant point in balancing the view that a relational approach is always a good thing is the expression that relationships have a 'dark side' (Welch and Zolakiewski, 2004). The reverse side of the positive attributes espoused in relationship marketing idealism of trust and commitment are issues of conflict, abuse of power, and opportunism. Welch and Zolkiewski (2004) suggest that further exploration should be made of what could be termed negative relationship values, such as guile and self-interest. The latter point of which forms the basis of the contention of Palmer (2000; 2002) that individuals and organizations are not motivated by co-operation and collectivism at all, but by self interest. Palmer contends that co-operation is an aberration and that motivation in business exchange is for self-benefit and longer-term self-preservation. He argues that selfishness is critical to the study of successful business relationships and may produce greater economic welfare than pervasive collectivism. This is re-iterated in Cox (2001) who contends that participants enter into exchange relationships for reasons of self or organizational gain, usually surrounding issues of money.

The role of power in relationship marketing

Any understanding of the nature of business exchange in vertical chains and attempts to promote a co-operative/collaborative approach, must first address the nature of power and its influence on relationship forming. Power as a construct in business-to-business relationships has received irregular and contrasting treatment from analysts. There are those that view the concept of power as alien to the effective workings of exchange relationships, where success is determined through principles of co-operation and trust; and that power negates co-operation (Doney and Cannon, 1997; Bretherton and Carswell, 2002 and Pole and Haskell, 2002). In contribution to the debate, Gummesson (1996), for example, considers power imbalance to be detrimental to sustaining a business relationship and Naude and Buttle (2000) express the common view of power to be a negative influence and not helpful in the building of relationship quality. In their comparative study of power in UK and Australian business-to-business retail relationships, Dapiran and Hogarth-Scott (2003) note that other writers such as Kumar (1996) and Kumar et al. (1998) also view power as the antithesis of trust; and that power is only viewed in a negative sense. A negative view of the role of power is, however, by no means universal. A differing viewpoint comes from a number of authors (Blois, 1998; Campbell 1997; Earp et al. 1999; Kalafatis, 2000 and Svensson 2001), who emphasize that not all relationships result in joint benefit, that they are not all based on mutual trust and nor do
they always need to be, and that trust alone cannot be depended upon. Earp, et al. (1999) for example, warn that the risk of viewing relationships as if they must involve commitment and trust is to ignore the rich diversity of business exchanges that not only exist, but are appropriate in different contexts.

Given the influence of the relationship marketing treatment of business-to-business relationships, and perhaps in the enthusiasm for what should make for ideal business exchange conditions; the role of power has been either overlooked or dealt with as a side issue, whereby it is rarely discussed in supply chains except to deny its importance (Williamson, 1995; Cox, 1999). There are authors, for example, Cox et al. (2003) who consider that power should be at the centre of any study of buyer-seller relationships; and recent texts have revisited seminal works in its study. The work of French and Raven (1959), for example, where power and influence is explored in organizational buying situations, is cited in Berthon et al. (2003), Farrell and Schroder, (1999), Collins and Burt, (2003) and Dapiran and Hogarth-Scott, (2003).

Williamson (1975) contends that each partner is motivated by the self-interest of retaining as much of this share for themselves (Cox, 1999), and that a situation of power must be the ideal position to be in. As a result there is a situation in buyer-seller relationships of continual manoeuvring for power superiority in order to secure a greater share of surplus value created through the possession and/or control of resources (Berthon et al. 2003; Stern and El Ansary, 1996). Kumar (1996) states that the vast majority of manufacturer-retailer relationships are imbalanced, a more extreme view is that channel imbalance means that relationships are inherently unstable and even those that do exist are in danger of becoming fief-like, where suppliers are tied-in to powerful, dominant partners (Blois, 1997). Johnsen and Ford (2002) cite the dangers of such asymmetrical relationships, where the power of the dominant party disadvantages the weaker party, and Kumar et al. (1998) warn that powerful channel members can enforce punitive capabilities and actions (in response to the errors or failings of a partner) in which they can inflict negative consequences. A significant point about power, however, is the contention that it has no regard as to whether exchange relationships are balanced or unbalanced (symmetrical or asymmetrical). Therefore, it is not safe to assume that the natural state for exchange relationships is one of symmetry and equilibrium or even fairness; indeed organizations may actively seek to unbalance symmetry in order to gain a larger share of the benefits (Feldman, 1998).
Relationships are seldom fair in the division of power or reward, nor are all parties equally active in commitment to a relationship (Gummesson, 1996; Kumar, 1996). Fearne et al. (2004) consider the issues surrounding fairness and justice in agri-food supply chains, gathering empirical data from supplier and retailer organizations. This is very useful with regard to identifying application of power imbalance and relational conflict. However, regardless of a desire to fulfil what is fair, a more general conclusion is that such partnership arrangements tend to ultimately offer the most to the more powerful business partner (Christopher and Jüttner, 2000). It is not, therefore, surprising that benefits are, or seem to be unevenly shared, but this does not mean that such power imbalanced relationships are not workable or enduring. Davies (1996) offers a compromise to this issue of living with power imbalance. He contends that the successful approach to partnering is through the admission that one channel member is normally in charge, and channel members that wish to co-operate to mutual advantage must focus on joint satisfaction of common objectives regardless of the background context of inevitable imbalance.

**Relationship marketing and Power issues in agri-food channel relationships**

Given the scant and mostly negative treatment of the context of power in business relationships and the predominance of study of what are viewed as positive relational factors: trust, commitment, co-operation, and mutuality, there appears to be a gap in business relationship literature concerning the role of power and the ability of organizations to manage power imbalance. The issue of building, lasting, meaningful and workable relationships where power imbalance and power-dependency are ever present is highly pertinent to the study of agri-food industry supply chain relationships. Here, power is generally skewed in the favour of those large retail buyers, and suppliers of (usually unbranded) products are dependent. Issues of power-dependency, conflict, trust, commitment, co-operation, and collaboration (Earp et al. 1999; Johnson et al. 1999) have been applied specifically to food supply chain and retailing industry contexts, for example, in Christopherson and Coath, 2002; Collins and Burt, 1999; Hogg et al. 1996; Hogarth-Scott, 1999; Matanda et al. 2001, Siemieniuch et al. 1999, Egan, 2000 and O'Keefe and Fearne, 2002. The UK agri-food industry has experienced concentration in most parts of the supply chain through backward vertical integration initiated by powerful multiple retail buyers (Collins and Burt, 1999; Galizzzi and Venturini, 1996; Howe, 1998; Hughes, 1994; Kumar, 1996 and Robson and Rawnsley, 2001). As a result there has been a shift in power
within food marketing channels towards the multiple retailer (Bourlakis, 2001; Fiddis, 1997) where the retailer is seen as the main gateway to consumers’ and gate-keeper between producer and consumer (Lang, 2003). Such developments are not restricted to the UK though, with Hobbs and Young (2000), for example, reporting on similar trends being witnessed in the United States.

Hughes (1994) describes food marketing and supply channels as having senior partners, channel captains, or channel leaders Shaw and Ennis, (2000) and O’Keefe and Fearne (2002) describe category leaders and these are normally large processor or retailer buyers. Retailers are looking for fewer and larger suppliers who can work with them in partnership (Fearne and Hughes, 2000; Hingley, 2001; White, 2000; Cowe, 1996 and Rademakers and McKnight, 1998). Hughes (1996), for example, states that retailers will continue to reduce the number of food suppliers and this is in agreement with the general business trend towards industrial buyers reducing their vendor relationships to a reasonable few. The trend is, therefore, for multiple retailers to develop exclusive relationships with fewer, favoured, single source or dedicated partnerships, and in this way suppliers are described as locked or tied-in (Dorsch et al. 1998).

Agri-food industry relationships are power-dependent. However, in contrast to some views in the relationship marketing literature, such relationships as these can exist and thrive despite imbalances in mutuality. Although power is notably imbalanced in agri-food relationships, in favour of retailer buying organizations, this does not necessarily result in a state of instability; rather the opposite is true, with the existence of many long-standing vertical supply chain relationships (Hingley, 2001). However, for those advocating collaboration in the supply chain, perhaps utilising a reduced source model (maybe even a co-operative supply structure) it is important to consider the origins of partnering behaviour in a business context; as identified in the lean-thinking concept pioneered by Toyota in car manufacture (Cox, 1999). In criticism, Cox (1999) calls this approach an ‘operational innovation treadmill to oblivion’, the process whereby a reduced supply base of suppliers benefit from preferred supplier status, but are forever engaged in the vicious circle of efficiency and cost led competition. In the medium-term there are oligopolistic benefits for suppliers that survive the consolidation process; however, buying organizations then use their power to aggressively apply leverage to supply chain survivors, thus using power to maximize value for them. Exclusivity may derive initial gains for suppliers, but the longer-term result of the consolidation /rationalization cycle
and re-cycle is more power play and thereby the process is perpetuated. The outcome, therefore, is not truly partnership and all that that implies in terms of mutuality, it is a state of exclusivity derived from cycles of supply base reduction. But even then, the natural state for a supply chain may not be one of stability; rather that this is just an interim phase in the continued power battle for share of surplus value. Further, in circumstances of preferred or even single source supply, it is the suppliers' that are much more likely to bear the burden of asset specific investment. As a result, consolidation may not produce security at all, but conversely it might increase dependence on the buyer (Feldman, 1998).

The notion devised in mainstream relationship marketing literature that power is always a negative and divisive influence that precludes relation forming, is clearly flawed. Power is ever-present in business-to-business exchange. A relationship approach does not replace the friction and continual power play between business exchange partners. Trust and mutuality exist to some degree in agri-food relationships, but expression is conditional and often at the behest of the retailer. Commitment and trust based relationships are not the only effective way of conducting business exchange. It is usual for organizations, even those engaged in partnering activity to seek to gain the upper hand. The ongoing power-play in vertical supply chain relationships endures in a state of flux, although this is not always overt (Cox et al. 2001; Ogbonna and Wilkinson, 1996; Howe, 1998), but this does not mean that effective exchange relationships cannot endure.

There is no doubt that the abuse of power is a destructive force, but the exercise of power in asymmetric relationships (be that through punitive action or just through functional conflict) is a more typical state than the existence of perpetual co-operation and power symmetry contended by some contributors to the debate. It is a natural desire for all organizations to gain advantage and to disrupt symmetry. However, striving for self-interest does not preclude organizations from acting in a co-operative manner, and cooperative and competitive business strategies can co-exist alongside one another, they are not polar opposites. Weaker parties in asymmetric relationships have a certain degree of tolerance to imbalance of power and such relationships are not necessarily unstable or short lasting (Blundel and Hingley, 2001; Narayandras and Rangan, 2004). A key element appears to be the admission by weaker parties of the existence of channel captains. Asymmetry is no barrier to entry, especially if suppliers have something a buyer wants, or suppliers consider that they may profit from the situation despite power imbalance.
The challenge for agri-food suppliers, big and small, is to first of all take the pledge that begins: I am a supplier to a vastly more powerful organization; my job is to meet the needs of end consumers via this outlet. Only by making this admission of channel leadership and where power lies, can suppliers move forward and strive for what are important, market survival and a level of organizational profit worth getting up in the morning for. If the supplier cannot accept market channel imbalance, or the derived living is not there, then it is time to try their hand in another market place. To move forward requires the acceptance of power-imbalance and the inherent nature of inequity and unfairness in supply chains and to this end the author is in agreement with the Davies (1996) view. Rather than fruitlessly fighting against imbalance, it may be more rewarding to concede control and this may be the first step to agri-food suppliers benefiting from the efficiencies of a truly integrated, (but retailer controlled) network, (Martin, 2005).

Majority of the approaches ignore a more fundamental and basic understanding of business-to-business relationships, which are driven by a much baser human and business instinct, the desire for power and its use to derive personal and organizational gain. It is this factor that will determine the relative failure of efforts at re-connection, vertical channel re-balance, and true relational marketing exchange in agri-food supply channels. Collaborative/co-operative activity makes good business sense, but it does not work as a blunt instrument of countervailing power. To be realistic such actions, undertaken even by large and integrated supply bodies, are unlikely to exert much leverage on even bigger and more powerful buyers. What collaboration does do is to bring suppliers closer to the heart of the market. It may bring in some joint channel reliance and interdependence, but must never be mistaken for mutuality of market control or reward. As an option to enforce symmetrical balance between exchange parties in agri-food channels, the possibility of legislative control and to a certain degree resultant voluntary codes, have been non-starters. Even if exchange relationships could forcibly be made to be balanced in partner size, input, and resultant reward (and assuming that trust were present and reciprocal), buyer and supplier organizations would still pursue preferred or exclusive supply arrangements.

Integration

The important dimension to be understood in a supply chain network is Integration. Integration aims to understand the degree of interactivity that exists within the organization and with their partnering organizations. This dimension considers how
‘interactive’ the value creation process is within their organization and with their supply chain partners.

**Internal integration**

Internal integration is the degree to which firms are able to integrate and collaborate across traditional functional boundaries to provide better customer service (Gadde and Snehota, 2000). New, (1995) pointed out that managing logistical activity involves other functions within the firm, namely marketing, finance, purchasing, and production. Coordination is required within the firm’s internal supply chain departments to realize the desired benefits for the firm (Lee and Whang, 2000). It is widely agreed that task interdependence is the catalyst for interdepartmental integration (Frazier and Gary, 1999). In simpler terms, customer satisfaction is dependent on the output of more than one worker or one functional area. Benefits will be realized by companies that operate their logistics processes as an integrated system rather than by optimizing functional subsystems (Babbar and Prasad, 1998). Numerous empirical studies suggest that collaborative cross-functional integration is positively associated with performance (Christopher and Juttner, 2000). Collaborative interdepartmental integration involves a predominantly informal process based on trust, mutual respect and information sharing, the joint ownership of decision, and collective responsibility for outcomes (Dudley and Lasserre 1989, Narus and Anderson, 1995, Doney and Cannon, 1997, Dapiran and Hogarth-Scott, 2003). Thus, collaboration between departments is often needed to ensure delivery of high quality services to customers, and involves the ability to work seamlessly across the silos that have characterized organizational structures (Hakansson and Wootz, 1979). Collaborative behaviour is based on cooperation (willingness), rather than on compliance (requirement). Its success is contingent upon the ability of individuals from interdependent departments to build meaningful relationships (Hingley, 2001). Higher levels of internal integration are characterized by increased coordination of logistics activities with other departments in the firm, increased importance of logistics in the overall business strategy, and a blurring of the formal distinction between logistics and other areas of the firm (Ellram, 1991).

**External integration**

External integration is the integration of logistics activities across firm boundaries. It reflects an extension of manufacturing enterprise to encompass the entire supply chain, not just an individual company, as the competitive unit (Ford, 1982). Managers are
coordinating with companies beyond their own, seeking new ways to lower costs or improve service through mechanisms such as vendor managed inventory and just-in-time scheduling (Jones and Riley, 1985). Collaboration is needed across enterprise boundaries interfacing with external suppliers, carrier partners and customers. As such, logistics is in a boundary-spanning role with these external customers as well (Hobbs, and Young, 2000). (Araujo et.al. 1999), identify customer service, quality, channel distribution, and total cost minimization as major boundary-spanning interface capabilities. Although not meant to be exhaustive of logistics capabilities, these concepts are mentioned most often in modern logistics literature and are central to modern logistics thinking (Christopher, 1992). Various external logistics interactions have been examined extensively in prior research (Cooper et.al. 1997). Higher levels of external integration are characterized by increased logistics related communication, greater coordination of the firm’s logistics activities with those of its suppliers and customers, and more blurred organizational distinctions between the logistics activities of the firm and those of its suppliers and customers (Morgan and Monczka, 1996).

Theory on network structure and dynamics

It should be noted that, from an analytical and a managerial perspective it is not feasible to examine any inter-company relationship in isolation. Relationships are influenced by other organizations that also interact and influence the parties to a dyadic interaction. The early IMP research largely focused on dyadic relationships and, indeed, the greater part of the theory and empirical research cases presented in Hakansson (1982) related to relationships with only two parties. This was the result of the methodology used and the explicit decision to focus initially on the dyad while recognizing that relationships are often, if not always more complexly connected. Turnbull and Ellwood (1984) developed the approach by examining tri-partite interaction involving international sales subsidiaries and agents.

Concurrently, both theoretical and empirical research was developing in the understanding that individual relationships could not be fully understood in isolation from the other relationships in which each party was involved and from the effects of relationships which surrounded them in the wider network of relationships. This has led to the development of theory on network structure and dynamics. Unfortunately, the pace of conceptual development in the network area has not always been matched by empirical study. This means that the network literature does not always provide clarity of description of network phenomena, let alone guidelines for managerial decision making. However, the network
view does provide a useful framework for analysis of business situations. It highlights the range of influences on individual companies, and relationships as well as the nature and implications of different actions by relationship participants. But, it does add another level of complexity to the description of business market behaviour and understanding of buyer-seller relationships. A useful overview of the literature is provided in Axelsson and Easton (1993) and in Henders (1992).

Peter Turnbull et al., (1996) has made an attempt to integrate various themes and findings of some of the series of studies conducted by the International Marketing and Purchasing (IMP) Group, in Europe and US over the past 20 years, in the nature of buyer-seller relationships. The themes of interaction, relationships, and networks encapsulate the major research thrusts of this group. He addresses these themes, which represent the major phases of challenging conceptual and empirical research with which the IMP Group have been concerned since its inception in 1976.

By 1974, early fragmented research into the industrial markets in the USA and Europe had established that purchasing was a multi-person activity, that customers were often reluctant to change their sources of supply and that there was a surprising degree of stability and durability in their dealings with many of their suppliers. Risk reduction and satisfying behaviour were evident and even large, powerful customers frequently sought cooperation with suppliers rather than brutally and unilaterally exercising their purchasing power in the market. Such cooperative behavior developed through relationships often entailed modification of systems and adaptations of products and service by both seller and buyer.

In Europe, during the 1970s, various explanations for these phenomena were offered, drawing on research conducted in Sweden, Britain and France (Hakansson and Wootz, 1979). It was apparent that increasing market concentration resulting in a few powerful players gave a more restricted choice of partners, and the large increment of change of partner became of increasing importance. Risk perception and risk reducing strategies were clearly possible explanations. High costs of change (switching costs) and strong source loyalty and inertia were observed in studies of organizational buying behaviour (Cunningham, 1986; Hakansson and Wootz, 1979). It also became clear that buyers take an active role in seeking out suppliers and influencing the interaction.

By 1975 these studies had led to a recognition that supplier-customer relationships were a
complex phenomena and that independent studies of buying behaviour or marketing activities should give way to research focused directly on the patterns of interaction between the two partners to a relationship (Johanson and Vahlne, 1977; Hakansson, 1982).

The IMP Group was formed in 1976 to develop and carry out cooperative research into the nature of the relationships between companies in these complex markets. Rather than following the previous research tradition of studying discrete purchasing decisions, it was agreed that it was important to understand the pattern of dependencies between companies, the evolution of their dealings over time, the adaptations that each made to meet the requirements of the other party, and the inter-organizational person contact that took place. As a result of a number of in-depth case studies carried out in France, Germany, Italy, Sweden and the UK a revised framework was proposed by the IMP Group to guide the development of research in business-to-business markets. This became known as the Interaction Approach (Hakansson, 1982; Turnbull and Cunningham, 1981).

**The interaction approach**

The paradigm which has become known as the Interaction Approach marked a reaction against the previous research tradition in business markets which had sought to analyze the different categories of single industrial purchases and the processes by which these individual purchase decisions are taken (Hakansson, 1982). Briefly stated, their observation at that time led them to a continuing research approach based on several ideas. First, the great majorities of business purchases do not exist as individual events and hence can not be fully understood if each one is examined in isolation. Nor did we believe that business purchases could be characterized as a process of action by the seller and reaction (or not) by the buyer. Instead, we saw business markets as arenas within which buying and selling companies interacted with each other. This interaction takes place within the context of a relationship between the companies. The previous experience of individuals and their companies in that relationship and in others are important influences on attitude and behaviour in both purchasing and selling. These relationships vary widely in nature; they can be distant and largely impersonal, so that they have similarities to those which might exist between consumers and the marketers of non-durable goods. However, it is observed that for a majority of companies in business markets, a small number of suppliers and/or customers were individually responsible for large volumes of their purchases or sales, and that in these circumstances the relationships between companies and these
important customers and suppliers tend to be close, complex and long term, with extensive contact patterns between many individuals from each company and significant mutual adaptation by both parties. This view contrasted with previous studies which tended to see markets as atomistic and consisting of large numbers of more or less anonymous customers with which marketers dealt at a distance.

Whatever its closeness or distance, the relationship between companies is the receptacle for the combined experience of the participants. The relationship consists of learned rules and norms of behaviour. It provides the atmosphere within which individual episodes take place. These episodes include negotiations, payments, deliveries, and social contacts, etc. Each episode in turn is affected by and affects the overall relationship. Furthermore, relationships evolve over time and can be considered to traverse a series of stages characterized by increasing mutual adaptation, reduced “distance” and increasing commitment (Ford, 1982). Relationship is not a dichotomous variable and the question for researchers is not whether a relationship exists in any particular situation. Similarly, for business people it is not a question of whether a company should establish a relationship in a particular case. Relationships do exist in a wide variety of forms and the agenda for researchers is to understand the nature of the relationships. Inter-company relationships are complex. It is simplistic to suggest that they can or should develop along a single continuum between “distant” and “close”, “good” and “bad.” All inter-company relationships simultaneously exhibit conflict and cooperation, with guile and self-seeking.

The Interaction Approach takes the relationship as its unit of analysis rather than the individual transaction. It involves simultaneous analysis of the attitudes and actions of both parties and emphasizes the essential similarity between the purchasing and marketing tasks in relationships. It sees relationships both as important in themselves and as predictors of individual transaction behaviour and is reviewed in detail in Hakansson (1982). Among the individual research tasks which have been addressed has been to find the variables which can best be used to describe relationships; how these relationships evolve over time; the variation in the nature of relationships in different circumstances; the atmosphere within which the interaction takes place; the contact patterns between the two parties and the bonding which occurs between the companies.

The research has highlighted the importance of separating the short-term management of individual relationships from the longer-term development of a strategy for the company’s portfolio of supplier and customer relationships (Turnbull and Valla, 1986). The research
has also shown the inter-relationship between the resources possessed by companies and how these are used in and affected by their relationship activities. A review of this work is found in Ford (1990). This research has lead to the view that it is the co-ordination and mobilization of the company’s portfolio of relationships and the use and enhancement of the resources of both companies through interaction in those relationships that is the basis of enhancing a company’s network position and hence its competitive advantage (Ford et al., 1996). This conceptual link between networks and competitiveness leads us to consider several contemporary research thrusts in the area of market competitiveness.

**An interaction approach view of competitiveness**

Research studies in the field of competitiveness and competitive performance have assumed increasing importance in recent years and were originally stimulated by the contribution of Porter (1981) and Peters and Waterman (1982). Obviously achieving a competitive position in a market depends on many inter-related factors. Gains in productivity, market share dominance, high R&D investment, achieving economies of scale and concentration on knowledge-intensive, high value-added products have been the subject of study (Cunningham, 1986).

Several researchers have linked competitiveness with a company’s ability to develop and manage its array of network relationships. Competition is viewed as being based on conflict, competitive advantage, co-existence, cooperation or collusion. They use three theoretical frameworks for their analysis, first the traditional marketing strategy paradigms; second, the interaction approach and, third, the network approach.

**Interaction and relationship strategy**

The importance of inter-company relationships as a way of exploiting and enhancing resources requires that a strategic approach is made to their analysis and management. But it is important to base ideas on the development of relationship strategy on an understanding of those wider factors which strategy must bear in mind and seek to change. Without a wider network view, any approach to relationship strategy runs the risk of degenerating into short-termism. It can also mean that the company may be unaware of the potential effects on itself and its relationships arising from the actions of other companies elsewhere in the network or of the opportunities for improving its overall position in the wider network which can be achieved through its interaction in its relationships. This means that development of relationship strategy depends on analysis of the company, its
individual relationships and its overall relationship portfolio and network position.

The starting point for the development of relationship strategy is the interdependence of companies. This interdependence takes many forms. Perhaps the most obvious is the need to generate revenue from other companies for the continuing existence and development of the company. Interdependence is also based on the need to use the knowledge and abilities of others, delivered in the form of products or services. Perhaps even more importantly, a company may also need to acquire some of the knowledge of other companies for itself, or wish to develop its own knowledge through interaction with the other company.

The basis for the interdependence of companies in business relationships is the resources which they possess. Companies interact with each other and develop relationships in order to exploit and develop their resources (Turnbull and Wilson, 1989).

Relationship strategy comprises the tasks of managing each of these relationships both individually and as part of an interrelated portfolio, each element of which has a different function for both of the parties involved. It involves the process of exploiting the company’s technologies in its relationships so as to maximize the return on the company’s technological investment (Turnbull and Valla, 1986).

**Relationship development and investment**

Ford (1980) suggests that supplier-customer relationships in business-to-business markets evolve over time, and considering the process of relationship development, careful management can obtain the best possible value from these relationships. Consequently, Ford analyses the process of establishment and development of supplier-customer relationships over time according to the variables of experience, uncertainty, distance (including aspects of social, geographical, cultural, technical, and time distance), commitment and adaptation. By considering the extent to which each of these variables is present in a supplier-customer relationship, it is suggested that such relationships follow a five-stage evolution process – pre-relationship, early, development, long term and final stage. Thus the development of supplier-customer relationships can be seen as an evolutionary process in terms of - the increasing experience of both partners; the reduction in their uncertainty and all kinds of distance in the relationship; the growth of both actual and perceived commitment; the formal and informal adaptations, and investment and savings involved in both sides’ organizations (Ford, 1980).
In order that supplier-customer relationships develop over time, it is necessary for both suppliers and customers to make some degree of investment in relationships. Consequently, business-to-business marketing can be seen as: A process of investments in market positions at the micro- and macro level (Turnbull and Wilson, 1989). Investment is of particular interest as investments in the relationship can be made by both the buyer and the seller. Johanson and Mattson (1985) suggest that marketing expenditures can be viewed as investments in market networks. They point out that most of the literature on investment in marketing deals with methods of calculating investments and not with the conceptualization of investments within marketing theory, although they quote two Swedish studies on the topic. Hagg and Johanson (1982) classify marketing investments as general, market-specific, and relationship-specific. Although there have been a number of studies focusing on investments in relationships, (Hagg and Johanson, 1982; Johanson and Mattson, 1985), it is worthwhile to consider one of these studies, the framework developed by Wilson and Mummaliani (1986).

The framework begins with the assumption of need complementarily leading to exchanges through interactions, as does the Johanson and Mattson (1985) model. It suggests that “relationships develop through incremental investments of resources”, which to be have made by both supplier and customer organizations. Such investments tend to be made only if the outcomes of these interactions within the relationship are perceived to be satisfactory, either now or potentially in the future. These investments may take the form of adaptations to the areas of product, process and organization (Hakansson, 1982). However, such investments are made not only to intensify the relationship and to demonstrate the interest that the partner has in developing a strong relationship, but also with the faith that the other partner will reciprocate (Turnbull and Wilson, 1989). In addition to furthering the development of supplier-customer relationships, according to Hammarkvist et al. (1982), these investment and adaptation activities may create social and structural (economic) bonds. These lead to mutual commitment as a measure of true source loyalty (Jarvis and Wilcox, 1977) and thus to long-term strong and profitable relationships with and are cemented with social and structural bonds and which become difficult to break (Wilson and Mummaliani, 1986).

It follows then that most cost factors and marketing expenses involved in supplier-customer relationships can be regarded as investments in relationship development (Johanson and Mattson, 1985). Such investments are classified as “general”, “market-
specific” and “relationship-specific” by Hagg and Johanson (1982). These investments “made by one party in a relationship with another party have an important impact on the costs of that party’s current or future transactions with the other” (Williamson, 1979, 1981). It might be expected then that the supplier-customer relationships will be very costly, perhaps making a negative contribution to supplier profitability, in their early stages. However, the costs of managing supplier-customer relationships might also be expected to decrease over time as a result of decreasing levels of investment and other marketing expenses in the following stages of the relationship (Turnbull and Wilson, 1989). Thus, the analysis of customer profitability is a key tool of strategic marketing management.

It has been explicitly recognized that the successful management of supplier-customer relationships depends on the company’s relationship management skills, the investments in initiating, developing and maintaining relationships and the allocation of resources between different relationships according to their likely return (Ford, 1980). To achieve this both sides of a dyadic relationship need to analyze the current and projected benefits resulting from the relationship. Ultimately, and specifically taking the supply side perspective, current and projected profits of customers (existing and potential) need to be analyzed and forecast, ideally on an individual basis but at least at market segment level. Such analysis if combined with an identification of the stage of each customer relationship allows a better understanding of the potential of the customer base and helps in the strategic and tactical planning and allocation of resources between customers of all types.

Shapiro et al. (1987) also developed the concept when investigating customer behaviour and produced a matrix to classify customer types on “cost to serve and net price dimensions.” They identify four types of customers – passive, carriage trade, bargain basement, and aggressive – and argue that profitability will vary between the groups. They further suggest managerial actions to manage this profit dispersion.

Krapfel et al. (1991) have further developed the strategic approach to managing buyer/seller relationships. They suggest a model in which relationship types and relationship management modes are mapped together to assess the optimal relationship portfolio. This mapping takes into account the transaction costs involved. As part of the relationship management process they also recognize the importance of matching the relationships and signalling intentions to partners. They see signalling as an important aspect in the adaptation process. The relationship types they identify (partner, friend,
acquaintance, and rival) are determined by two factors: relationship value and interest commonality (commonality of a firm’s economic goals with its perception of its potential partner’s economic goals). While the relationship management modes, again identified two-dimensionally by perceived power position and interest commonality, suggested are collaboration, negotiation, administration, domination, accommodation, and submission.

Wilson and Mummalaneni (1986) see relationship development as a process of bonding which leads to mutual commitment to the relationship. The Wilson and Mummalaneni framework draws on the work of Turner (1970) and McCall (1970) on bonding and on Rusbult’s (1980) work on investments in relationships.

Investments by any party serve to intensify the relationship, for they demonstrate not only the interest that the party has in building a strong relationship, but its faith that the other party will reciprocate. Commitment results from satisfaction and investment and is the measure of true source loyalty as it involves the bond of attachment to the source of supply (Jarvis and Wilcox, 1977). Investments are key elements in the development, or structural bonds. Structural bonds have four components: investments, termination procedures, social pressures, and available alternatives. A detailed description of the model and its operationalization is contained in Wilson and Mummalaneni (1986).

**Demand Management - concept**

Demand Management is a component of a planning process that needs to have the right product (or service) in the right place, at the right time, at the right price. Demand Management (DM) is defined as “making decisions and acting in real time to track, assess, and handle real demand and supply in the context of plans and forecasts.” And also “DM is a process that involves balancing demand and supply between forecasting / planning cycles.” A simple yet broad definition of DM is “matching of supply and demand over time.” Under this definition, the phrase “over time” is important because it not only means at every instance of time (i.e., continuously in real time), it also means while making decisions about future supply and demand during planning cycles. This means DM processes are involved in long-term, medium-term, and short-term (including real time) planning processes. Under this broader definition, it is extended beyond just “balancing demand and supply between planning cycles.” (Larry Lapide, 2006). Demand Management requires coordinated decision making among supply-side and demand-side managers. In order to sustain optimal profits, Demand Management decisions need to be made jointly.
across these management functions. True optimization needs to proactively manage
demand, not just react to it. This involves recognizing that customer demand is variable
and somewhat controllable, so that it can be optimally generated and shaped in
conjunction with supply. It is also important to recognize that Demand Management is not
synonymous with Demand Forecasting.

Demand uncertainty

Demand uncertainty reflects the uncertainty of the customer demand for a product. Demand volatility is the main sources of environmental uncertainty encountered by
companies in which the supply chain operates. Demand volatility reflects the variability
and unpredictability of market demand, which tends to be distorted and amplified along a
supply chain, a phenomenon commonly called the Forrester effect or the Bullwhip effect
(Lee et al. 1997). The bullwhip effect might be caused by a manufacturer’s behaviours in
responding to demand forecast updating, order batching, price fluctuations, and rationing
and shortage gaming (Lee et al. 1997).

Another source of environmental uncertainty facing firms is industry clockspeed, which
also tends to be amplified along a supply chain (Fine, 1998). Clockspeed amplification
describes the fact that manufacturers face a remarkable decline in the price / performance
ratio and compression of product life cycle as they are situated closer to the consumer end
of the supply chain. As the rates of change in an industry increase especially changes in
technology, consumer preferences, and competition so does the clockspeed of the industry.
To compete, firms in such an industry need to adjust the speed of their internal operations
to meet the accelerating external clockspeed.

Forecast volatility

The forecast changes are continually updated as the buyer receives new information about
the demand it faces. This problem, which we refer to as forecast volatility, raises the
question of when the forecast information provided by the buyer is sufficiently accurate to
justify the supplier acting on it. A supplier that will act immediately on any given forecast
will likely face significant future adjustment and rework costs.

Second, forecasts provide information about what the buyer intends to do in a given future
state of the world. These intentions, however, are not verifiable and cannot be enforced.
This makes contracting based on shared forecasts extremely difficult. In the absence of a
contractual obligation for the buyer to purchase what it has forecasted, the buyer has an
incentive to inflate forecasts to assure sufficient supply (forecast inflated forecasts, the supplier might prefer to delay its actions to a point in time when the buyer is willing to commit to its forecast).

Confidentiality

Lee and Whang (2000) point out several hurdles that face information sharing in a supply chain, including the issue of confidentiality. In general, vertical information sharing, e.g., transmission of point-of-sales data between a retailer and a manufacturer, has two effects, the 'direct effect' on the payoffs of the parties engaged in information sharing, and the 'indirect effect' (or 'leakage effect') from other competing firms. For example, knowing that the manufacturer receives some information from a retailer, the other retailers may respond to the fact by changing their strategies, and such reaction may cause additional gains or losses to the parties directly engaged in information sharing. . . . Vertical information disclosures often result in horizontal information ‘leakage.’ For example, when a retailer shares its information with a supplier, other retailers may be able to infer such information from the actions of the supplier even though the information transmission is confidential, and hence change their strategies for the game of horizontal competition. (Li. L, 1999)

Demand distortion

Demand distortion is mainly due to information distortion. Information distortion is a troublesome problem in supply-chain management. The most familiar form of information distortion is the bullwhip effect. Information transparency among different functions within an organization and across the supply chain partners reduces the information distortion. Information transparency means sharing information among all stakeholders. The decision made in isolation without other departments of an organization and other partners of the supply chain leads to demand distortion.

Speed

Speed refers to how quickly information is communicated. There have been many changes that have affected the speed, accuracy, and overall effectiveness of forecasting. Technology has increased the speed at which forecasts can be calculated and updated. The market dynamics is changing very rapidly and it is important that information be disseminated quickly to the appropriate people to take a corrective action based on the latest information available. This can only be achieved by simplifying the process and
developing the demand signals based on changes in demand pattern. If we can significantly reduce throughput time, we can take corrective actions more frequently, enabling companies to follow demand patterns more closely. All these can help the Sales & Operations Management to reduce Demand volatility.

**Demand sensing & respond capabilities**

Demand sensing refers to distinguishing changes in customer demand much more quickly through alert systems. Most companies take longer than two weeks to handle a change in demand and relay that change to their supply chain. However, a few larger companies have developed demand signals based on changes in demand pattern and then pass them on to the supply chain. As companies shift from demand and supply matching to demand sensing via alert systems, demand shaping via stochastic/probabilistic approaches, focus on demand visibility, and fast response to demand signals, many organizations will be redeploying or retooling their existing demand management and forecasting systems and processes. This will make their supply chains more agile, flexible, predictable, and profitable.

Sense and respond capabilities allow manufacturers, the ability to monitor their supply chains through alert systems and then decide quickly how to profitably respond to the demand. Digitalizing the Supply Chain allows companies who have complex and very widely dispersed supply chains around the world to digitally represent those supply chains and exercise many “what-if” scenarios to develop the most effective supply chain environment and develop demand signals by studying demand patterns.

**Sales Force Automation (SFA)**

SFA was conceived as an electronic method to collect and analyze customer information from marketing and contact center organizations that could be used to advance opportunities for customer retention and acquisition as well as enhance marketplace relationships and revenue. In addition, the sales force needed automation tools that could assist them to more effectively manage their existing accounts; prospect for new customers; track the effects of pricing, promotions, campaigns, forecasts, and other sales efforts on their pipelines; generate meaningful analysis and statistics from their sales database; become more mobile; organize their contact lists; and have real-time customer information in an easily accessed presentation.
Virtual Integration

Virtual integration creates ability on the part of the firm to affect better process control and also to manage demand volatility better (Mason et al., 1998), allowing manufacturers to substitute “information for inventory” and thereby improving resource utilization for both manufacturers and suppliers (Dudley and Lasserre, 1989; Ramamurthy et al., 1999; Waller et al., 1999). Thus, virtual integration can be seen as strategies to reduce the influences of environmental uncertainty by improving inter-firm information processing, coordination, and control (Forster and Regan, 2001), Mason-Jones (1998). Consequently, it is suggested that virtual integration will be more likely to be observed when firms operate in uncertain environments.

With greater information processing and communication capabilities, as well as better control and feedback mechanisms provided by IT, trading partners are able to achieve greater inter-firm collaboration without common ownership (Bensaou and Venkatraman, 1996; Chatfield and Yetton, 2000). The major advantage that virtual integration can bring about for managing a supply chain is enhanced visibility (Allem, 2000). An electronically integrated supply chain allows the suppliers to have greater downstream visibility, thus giving them greater ability to meet downstream manufacturers’ varying market conditions. The visibility dramatically expands knowledge base of the system. With seamless information channels connected to suppliers, and thus a high level of supply-chain visibility, manufacturers can more easily track variations in production, product quality, inventory levels, and delivery capability of suppliers. By receiving such information in a more timely way, manufacturers can plan and adjust their own operations more rapidly, and thereby achieve greater adaptability to any unexpected events caused by suppliers. On the other hand, by providing suppliers with timely information regarding their own changes of plan, manufacturers also allow their suppliers to adjust themselves to such changes more rapidly.

‘Virtual’ enterprises

Requirements Networked and ‘virtual’ enterprises are becoming a new organizational paradigm, creating challenging opportunities in terms of management. The coordination and optimization of complex and dynamic supply and production networks, consisting of independent and autonomous companies, require a thorough rethinking of traditional business processes and the definition of new collaboration methodologies (Beamon, 1998).
In fact, full benefits of a close cooperation within the production network can only be achieved when the individual companies are able to inter-operate at the business processes level. By adopting new approaches for supply chain integration and collaboration, companies can achieve significant returns through efficiency improvement, higher delivery reliability, better asset and capacity utilization, faster time to market and responsiveness (Lee and Whang, 2001).

As a recent general trend, companies are focusing on their core competencies, with a large recourse to subcontracting, leading to very complex links in terms of information systems. Scheduling production in a large manufacturing environment requires a real-time knowledge of the status of the resources, of the availability of manufacturing lines, of inventories, etc. In general, current systems do not fully provide a real-time flow of information between any given plant and the rest of the supply chain. Rather limited functionality is available concerning integrated planning and optimization of the manufacturing network. In particular, this is the case for processes such as promising a delivery due date to a customer order (available-to-promise activity), providing active early warnings across the whole network, and solving the problems related to large overstocks, long throughput times and reduced responsiveness to unplanned events (Westkamper, 1998). On the other hand, it is recognized that there is a lack of simple and low-cost solutions for small and medium enterprises, capable of increasing their responsiveness and their level of integration into existing networks (Pillep et al. 1999). In general terms, information systems supporting dynamic networked enterprises should be able too (Azevedo and Toscano, 1999; Azevedo et al. 2001). It should be noted that substantial research has been done on topics such as decentralized production management systems (Richards et al. 1997), network organizations (Ching et al. 1993; Sauer and Bruns, 1995), supply-chain management systems (Fox et al. 1993; Thomas and Griffin, 1996) and decision support systems for order planning (Kingsman et al. 1993; Leachman et al. 1996).

**Issues and challenges in adaptation of IT**

**Electronic partnering options**

Electronic partnerships (The word “partnership” is used broadly to encompass formal and informal, one-time and recurring, contractual and non-contractual inter-organizational exchanges and relationships) are IT-enabled inter-organizational (B2B) relationships for pursuing mutually beneficial business interests, which range from generating revenue to
gaining access to new markets and technologies, to reaping economies of scale and scope, to improving product quality, and to developing new products and services (Gulati, 1998). To realize these business objectives, companies engage in different types of electronic exchanges, involving physical or information flows. While the most visible and tangible outcome of such exchanges is the sale or purchase of a product or service, exchange relationships also involve coordination and collaboration to facilitate the development and production of goods and services (Johnson and Selnes, 2004).

**Procedural complexities**

Standardizing, streamlining, and synchronizing business processes is a critical yet challenging aspect of electronically enabling these activities. Especially when several business partners are involved, with each subscribing to a different set of standards and protocols, the task of seamlessly integrating these processes across firms can be extremely complex. Procedural complexity is a function of many factors, such as the number of tasks that need to be performed, the inherent complexity in performing one or more of these tasks, the nature of linkages between the tasks, the number of people required to execute the tasks, and the number of functions, departments, and business units involved.

**Technological compatibility and competency**

Expansion of integration efforts across the supply chain is complex not only due to the diversity of processes but also due to the different IT systems and platforms that characterize most business coalitions. The integration of disparate systems within and across organizations may require: revamping of the current technological platforms; developing front- and back-end interfaces that can readily exchange and process information; outsourcing part of IT operations; and selecting appropriate integration methods, tools, and vendors. Such technological decisions can be very challenging, especially for non-IT savvy companies.

**Partner perceptions and beliefs**

Companies also have to deal with the various perceptions and beliefs (about engaging in electronic exchanges) of their current and prospective business partners. These concerns range from impersonalization of business relationships to loss of control, ownership, and flexibility. There is also the risk of partners losing interest and motivation due to a perception of inequity (feeling unfairly treated or being under rewarded in the relationship).
Financial feasibility

Building and operating a private electronic hub is a costly proposition; costs can run into millions of dollars. Even from the standpoint of the participants, it is expensive to invest in the proprietary technologies required to join these private networks. In addition, if the company does not have the required technical expertise, it will have to incur significant expenses in recruiting, training, and buying expertise from technology vendors and business consultants.

Political forces

Finally, there is the human/political factor that influences all change related decisions. Developing electronic partnering capabilities can entail significant revamping of existing processes and systems and require retooling and retraining of employees. The necessary change in business models, work processes and governance structures is often radical enough to fall under the category of “transformational” change, which is always a challenge, especially if people don't perceive the imminent business risks. Resistance is likely to occur when suggested changes are viewed as a direct threat to proven business models and competencies.

E-Participation

A key challenge facing the industry is to widen e-participation. The lack of a common frame work and platform across the whole intermediary sector continues to be key factors inhibiting the widespread participation of intermediaries in e-commerce. Some of the other barriers to participation to SMEs are E-commerce adoption, connectivity, lack of resources etc.

IT - Knowledge

There are obstacles in developing the necessary skills and technical knowledge, many businesses are tempted to postpone adoption of the innovation until the barriers to adoption are lowered or circumvented. The implication of this theory is that overcoming the lack of knowledge of the innovation will lead to greater likelihood of adopting the innovation. Ettlie (1990) also found that business owners with more knowledge of the technological innovation are significantly more likely to implement an aggressive technology adoption policy. Niedleman (1979) attributed the failure of European small businesses to utilize IT to lack of IT knowledge. In a study of Singapore small businesses, Gable and Raman (1992) found that small business owners tend to lack basic knowledge
and awareness of IT.

E - Security

The studies show that considerable security deficiency/threats exist in SCM systems of organizations. The issue of security is raised on a number of occasions in the Internet adoption literature and forms an area of serious concern for most small and medium enterprises. Feelings of insecurity can be caused by perceived risk, lack of privacy, or lack of trust for an innovation. Bauer, (1960); Webster (1969), and Ostlund (1974) introduced risk as an additional dimension in diffusion and adoption. Cox and Rich (1964) referred to perceived risk as the overall amount of uncertainty perceived by a consumer in a particular purchase situation. Chaudhuri (1998) stated that low levels of perceived risk in products are related to high level of positive feelings during consumption. A common and widely recognized obstacle to electronic commerce adoption is the lack of security and privacy over the Internet (Bhimani, 1996; Cockburn and Wilson, 1996). These factors led many to view e-commerce as a risky undertaking.

High cost

The high costs of e-business development, implementation, and maintenance on the one hand and the failures of numerous dot-coms on the other hand, necessitate the development of a well thought out e-business plan and model.