CHAPTER - 2

LITERATURE REVIEW

The current chapter has two main purposes; first, to clarify the theoretical framework of the core concepts underlying supply chain management in a general sense. Second, to review extensively the extant literature that relates more directly to the objectives of this research. This chapter produces an overview of what has been done, and it will identify the gaps in the existing research.

2.1 Introduction to Supply Chain Management

For the present Business Environment, with short product life cycles, joint venture complexity, and changing requirements for customer service, it is very essential to study the complete scope of supply chain management, from the suppliers of raw material to in-store demand for products (Davis, 1993). Supply chain management is still a relatively fresh concept in the research literature and thus lacks a clear definition among scholars, industry managers, and researchers. The first academic papers to address SCM directly appeared in the early 1980s. Many of these research papers were advanced by the consulting firm of Booz, Allen and Hamilton (Oliver and Webber, 1982). Oliver and Webber in 1982, have explained the SCM is the single system that is responsible for logistics aspects and it is entirely out of control of the manufacturing and other aspects of an organization.

The following condensation of supply chain definitions facilitates a demonstration of its fundamentals and essential parts, which is included in the research literature. Nevertheless, while there are many definitions of SCM, the intention here is not to find or select the most up-to-date or best definition, but instead to show the different points of view. The APICS Dictionary defines a supply chain using a two-part explanation. Firstly, it covers the processes from the initial raw materials to the ultimate consumption of the finished product linking across supplier user companies. Secondly, it addresses the function within and outside a company to produce products and serving the customers by creating the value chain (APICS, 1995).
Stevens (1989) defines a supply chain as a system that includes material suppliers, production facilities, distribution services and customers linked together through the feed-forward flow of materials and the feedback flow of information. Handfield and Nichols define the supply chain as multiple organizations linked together to provide goods and services to the end customer (Handfield and Nichols, 1999; Handfield and Nichols, 2002). The information flows through the upstream supply chain and the products flow through downstream supply chain.

Based on the research of Bechtel and Jayaram, most of the existing definitions for supply chain management are categorized as follows:

**Table 2.1: Definitions of Supply Chain Management**

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Definition of Supply Chain Management</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chain Awareness School</strong></td>
<td></td>
</tr>
<tr>
<td>Jones and Riley 1985</td>
<td>Supply Chain Management deals with the total flow of materials from suppliers through end users</td>
</tr>
<tr>
<td>Houlihan 1985</td>
<td>Supply Chain Management covers the flow of goods from supplier through manufacturing and distribution chain through the end users</td>
</tr>
<tr>
<td>Stevens 1989</td>
<td>Controls the flow of materials from suppliers through the value-adding processes and distribution channels, to customers</td>
</tr>
<tr>
<td>Lee/Bellington 1992</td>
<td>Networks of manufacturing and distribution sites that procure raw materials, transform them into intermediate and finished products, and distribute the finished products to customers</td>
</tr>
<tr>
<td><strong>Linkage School</strong></td>
<td></td>
</tr>
<tr>
<td>Scott and Westbrook 1991</td>
<td>Supply Chain is used to refer to the chain linking each element of the production and supply process from raw material through to the end customer</td>
</tr>
<tr>
<td>Turner 1993</td>
<td>Technique that at all the links in the chain from raw materials supplier through various levels of manufacturing to warehousing and distribution to the final customer</td>
</tr>
<tr>
<td><strong>Information School</strong></td>
<td></td>
</tr>
<tr>
<td>Johannson 1994</td>
<td>Supply Chain Management is really an operations approach to procurement. It requires all participants of the supply chain to be properly informed. With SCM, the linkage and information flow between various members of the supply chain are critical to overall performance</td>
</tr>
<tr>
<td>Towill 1997</td>
<td>A supply chain is a system, the constituent parts of which include material suppliers, production facilities, distribution services; customers linked together via the feed forward materials and feedback flow of information</td>
</tr>
<tr>
<td>Harrington 1995</td>
<td>Production and information flow encompassing all parties beginning with the supplier’s suppliers and ending with customers or consumers/end users flows are bidirectional</td>
</tr>
</tbody>
</table>
## Integration School

<table>
<thead>
<tr>
<th>Author</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooper and Ellram 1990</td>
<td>An integrative philosophy to manage the total flow of a distribution channel from the supplier to the ultimate user.</td>
</tr>
<tr>
<td>Ellram 1991</td>
<td>Supply Chain Management is an integrative approach to using information to manage the materials flow from the suppliers to end user to achieve improved customer service at reduced overall costs; SCM represents a network of firms interacting to deliver a product or service to the end customer.</td>
</tr>
<tr>
<td>Hewitt 1994</td>
<td>Supply chain integration is only a natural result of redesigned business process not realignment of existing functional organization.</td>
</tr>
</tbody>
</table>

*Source: Bechtel and Jayaram, 1997.*

### 2.2 A Management Perspective: The Four Management Stages

According to Ross (1997), logistics can be seen as developing through four distinct areas: warehousing and transportation management, total cost management, integrated logistics management, and supply chain management (see Table 2.2). In the first management stage, the function of logistics was seen purely as a tactical function consisting of a decentralized group of enterprise-wide operational activities associated primarily with warehousing and transportation. The second stage of logistics is considered as the centralization of logistics functions targeted at optimizing operations costs and customer service. The third stage is derived from two management concepts. The first of these is described as the integration of core logistics functions with inventory planning, order processing, production planning, and purchasing. The second concept can be established in the conservatory of logistics communication outside the company to embrace the entire supply chain, beginning with the initial supplier and concluding with delivery to the end customer.
Table 2.2: The Four Management Stages in Supply Chain Management

<table>
<thead>
<tr>
<th>Period</th>
<th>Stage 1 Until 1960s</th>
<th>Stage 2 1970s-1980s</th>
<th>Stage 3 1980s-1990s</th>
<th>Stage 4 1990s-2000s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management stage</td>
<td>Warehousing and transportation</td>
<td>Total cost management</td>
<td>Integrated logistics management</td>
<td>Supply chain management</td>
</tr>
<tr>
<td>Management focus</td>
<td>Operations performance</td>
<td>Optimizing operations, cost and customer service</td>
<td>Tactics/strategies, logistics planning</td>
<td>Supply chain visions, objectives and goals</td>
</tr>
<tr>
<td>Organization design</td>
<td>Decentralized functions</td>
<td>Centralized functions</td>
<td>Integration of logistics functions</td>
<td>Partnering, virtual organization, market co-evolution</td>
</tr>
</tbody>
</table>


The fourth and final stage of logistics is established via the emergence of SCM. According to Ross’ model, at the foundation of phase 4, SCM is defined as having two dimensions, and it centers on organizations with which to structure close relationships with channel partners. The first dimension consists of an operational strategy based on accelerating the cycle time of inventory and information flow, and optimizing the linkage between internal functions and supply partners. The second consists of the competencies of intersecting supply channels focused on the creation of shared marketplace and competition visions. Ross is also one of the first authors to pinpoint the fact that the first and most important of the SCM strategic resources are the people who define the company’s work culture, and who plan and execute the enterprise business functions.

2.3 An Industrial Environmental Perspective

An additional, simplified clarification of the developments of logistics is given by Moeller (1995). He states that the progression in Logistics has emerged as an outcome of the changing industrial environment over time.

In the 1950s, core interest was focused on production volumes and during that time, production was excluded from logistics. Logistics is largely associated with inventory movements. Increased service and a more expanded variety of
products were representative of the trends in the market in the 1960s. At the time, inventory was the existing mechanism for distinguishing between supply and demand. Efficient physical distribution, warehousing, and material handling processes are observed as logistics activities.

The change from growth to stagnation was the profile of the 1970s. Logistical costs increased, and the cost of capital exploded as well. Inventory turnover rates were the most important focus, and logistics is seen from a holistic system standpoint, which included production as well. In the 1980s, a revolution in information technology had a significant impact on logistics. Computer integrated manufacturing (CIM) was becoming a buzzword around the globe. Sales, purchasing, and further administration functions is united with production and distribution functions through integrated information systems (e.g., SAP R/3). Additionally, trends towards Japanese manufacturing concepts, such as just-in-time (JIT) and total quality management (TQM) in every manufacturing aspect were ubiquitous.

Table 2.3: Changes in The Industrial Environment Related to Logistics

<table>
<thead>
<tr>
<th>Period</th>
<th>Industrial Environment</th>
<th>Industry Focus</th>
<th>Logistics Focus</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950s</td>
<td>Unsaturated markets; production volume</td>
<td>Costs</td>
<td>Inventories</td>
</tr>
<tr>
<td>1960s</td>
<td>Increased service and more diversified products</td>
<td>Service</td>
<td>Distributions</td>
</tr>
<tr>
<td>1970s</td>
<td>Capital deployment</td>
<td>Profitability</td>
<td>Production</td>
</tr>
<tr>
<td>1980s</td>
<td>Competition and saturated markets</td>
<td>Total quality management</td>
<td>Purchase, production, sales</td>
</tr>
<tr>
<td>1990s</td>
<td>Globalization; partnership; ecology</td>
<td>Time</td>
<td>Business processes</td>
</tr>
<tr>
<td>2000s</td>
<td>Outsourcing and global transferring</td>
<td>Cost efficiency</td>
<td>Technology</td>
</tr>
</tbody>
</table>

Source: Adopted from Pejvák, O, 2009.

In the 1990s, topics like global manufacturing, alliances and ecology, and “green” appeared which affected even small and medium-sized companies. Time was also focused on as the single most important factor in logistics. As a result, many companies were forced into order production, from a make-to-stock
environment towards an assembly make to order, one of a kind production, or even engineer-to-order process. As a consequence of the changing industrial environment and the resulting logistics necessities, the logistics focus changed progressively from inventory management to the management of business processes.

2.4 An Integration Perspective: The Integrated Supply Chain

Christopher (1998) states that the concept of supply chain management is the fact not more than the extension of the logic of logistics. In fact, in the traditional perception, logistics management is concerned primarily with optimizing flows within the organization while supply chain management recognizes that internal integration alone is insufficient. Stevens (1989) suggests a four-stage integration model (see Figure 2.1).

Figure 2.1: The Integrated Supply Chain

Stevens presents a framework for accomplishing an integrated supply chain. Figure 2.1 proposes that there is, in effect, an evolution of integration from

```plaintext
Source: Adapted from Stevens, 1989.
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the stage 1 position of complete functional sovereignty, at which each business function, such as production or purchasing, is responsible for its own activities. Because of this, isolated optimization is the result. At this stage, the largest part of most supply chains is fragmented and can be distinguished by staged inventories, sovereign and often incompatible control systems, and primarily heavy organizational boundaries.

Stage 2 involves functional integration, which focuses principally on the internal flow of goods in the company. This means that companies have acknowledged the need for at least a limited degree of integration between contiguous functions; e.g., distribution and inventory management. The chief distinction here is still the importance of cost reduction rather than performance improvement in the company. Customer orders are forwarded. As a result, there is very poor visibility of real customer demand, which leads to insufficient planning and unnecessary buffer stocks between the different units.

At stage 3, the organization and implementation of an “end-to-end” planning framework within the company are in place. Interrelated to the planning and control systems, companies will use integrated systems, such as ERP, which could include a well-managed master schedule with a MRP system. This stage engages the integration of those features of supply chain management directly under the control of the individual company.

In stage 4, full supply chain integration is achieved by extending the scope of integration outside the company, where the linkage and coordination of activities now proceed upstream to suppliers and downstream to customers.

2.5 Drivers of Integrated Supply Chain Strategy

Firms adopt innovations for various reasons. For instance, firms adopt different enterprise systems (ES) to improve information flow and order processing efficiency (Koh et al., 2006). Another reason is that firms assume that ES will integrate their business information, which provides them with competitive advantage, however concrete business benefits have been uneven across adopting firms (Stratman, 2007). The financial justifications are vital for
managers to decide about adopting new technologies. Nevertheless, the cost is not
the only reason (Reinganum, 1981; Abrahamson and Rosenkopf, 1993; Iacovou et
al., 1995). The type of industry involved, for instance, is one factor that influences
the adaptation of innovation.

Reinganum (1981) emphasized that if the entry costs of an industry are
substantial, then adoption of innovation is not necessarily coincident (Reinganum,
1981). In the past, large manufacturing companies usually adopted ES while
today, such adoption is evident among an increasing number of medium-sized
firms as well (Koh et al., 2006). The literature has identified two theories that are
antecedents of enterprise systems, namely, the Rational Efficiency Theory and
Bandwagon Effect (Frohlich and Westbrook, 2002; Tsikriktsis et al., 2004).

2.5.1 Rational Efficiency Theory

This theory holds that information about new technical systems
disseminates from adopters to non-adopters instantaneously, and firms choose to
adopt the innovation technology rationally. The number of innovative technology
adopters increases, so that more non-adopters become aware of that technology
(Abrahamson and Rosenkopf, 1993). Another fact is that the costs of innovation
decrease over time and attract more users (Abrahamson and Rosenkopf, 1993).
Based on this theory, firms adopt new technologies, assuming that these systems
will improve the efficiency and effectiveness of their businesses, also referred to
as anticipated performance. Additionally, firms assume that these information
systems facilitate their access to new markets (Frohlich and Westbrook, 2002;
Tsikriktsis et al., 2004).

The literature suggests two rational efficiency explanations for the
adoption of enterprise systems (Frohlich and Westbrook, 2002). The first driver is
greater access to new markets. Supply Chain systems are perceived in many
industries as one of the most powerful tools presently available for creating real
competitive advantage for accessing new markets. By providing customers with
unrivaled benefits through different enterprise systems, these systems allow
companies to better satisfy existing clients and win over the most profitable
customers in new markets.
The second rational efficiency argument for adopting Supply Chain systems is the anticipated performance improvement in the focal firm. In theory, better coordination reduces uncertainty throughout networks, and a reduced amount of inventory and finished goods move more efficiently. This improved coordination in the company translates into reduced variability and elimination of non-value adding activities in the company, so it leads to greater operational performance.

2.5.2 Bandwagon Effect Theory

The bandwagon effect theory takes a completely different view compared to the rational efficiency since it holds that firms adopt innovations because of external pressure from other firms that have already adopted that technology. In contrast, rational efficiency states that firms adopt innovations because of their individual assessments of the new technology’s efficiency (Abrahamson and Rosenkopf, 1993).

The other main driver of Supply Chain systems adoption is the theory of the bandwagon effect. These “so-called” bandwagons are dispersal processes in which organizations adopt new technologies, such as different enterprise systems, not because of any core rational efficiency assessment of the practice for the focal firm, but because of the external pressure caused by the main customer of the firm or by a large number of organizations that have already adopted the concept or technology in the same market (Tolbert and Zucker, 1983). It has also been confirmed that in some cases, even after companies have adopted the new technology and are assessed as being highly inefficient such that they will probably cause losses, they are still adopted because of bandwagon pressures (Abrahamson and Rosenkopf, 1993). Particularly in medium-sized firms, the pursuit of legitimacy leads to the adoption of different technologies because companies are anxious about being perceived by customers, suppliers, and competitors as an industry slacker rather than because of any justifiable fears about the costly adopted technology (Abrahamson and Rosenkopf, 1993; Frohlich and Westbrook, 2002).
External pressure is an important antecedent of ES adoption (Frohlich and Westbrook, 2002; Tsikriktsis et al., 2004). Larger firms that have adopted a new technology will pressure their suppliers to adopt the same approach in order to improve the flow of information, materials, and finances between each other.

2.6 Supply Chain Systems

Markets are becoming more transparent, customer demands are being met in a more customized approach (Jensen, 1999; Pepper, 1999), and in general, the rate of change in the business world continues to increase (Brown, 1998; Gleick, 1999). These developments on supply chains having a high force on the firm management. The exclusive implementation of supply chain systems on the firms shows drastic developments on the internal process, plant productivity, product quality and reducing production costs. The companies are mainly focusing on the strategies for supply chain towards the organizational superiority. The supply Chain Systems also leads to the cost reductions in the transportation. Another incentive appears to be the commencement of the network economy (Arthur, 1996; Castells, 1996) that stimulates the management to revise the coverage area and the results of SCM. In this network economy, the completely vertically integrated business firm may be becoming the exception among the ever-changing networks of organizations (Tapscott, 1996; Fine, 1998; Kelly, 1998).

Information technology (IT) infrastructure has become a significant enabler of organizational competencies and a major contributor to firm performance (Frohlich and Westbrook, 2001; Santhanam and Hartono, 2003; Bardhan et al., 2006). ES is one of the most important information technology categories to emerge in the last decade (Cotteleeer and Bendoly, 2006), and it is important and attractive for many firms from an economic perspective (Mabert et al., 2000). There is no specific listing of systems known as enterprise systems per se in the literature; however, the following systems are mentioned as being within the category of ES in various studies: Enterprise Resource Planning (ERP), Electronic Data Interchange (EDI), Customer Relationship Management (CRM), Product Data Interchange (PDI), financials, payroll processing, human capital
management, and various decision support systems (Vickery et al., 2003; Hendricks et al., 2007; Ramasubbu et al., 2008).

In the year 1995 Internet Technology enters the market, gradually the companies have started adopting the Internet for the different transactions. By the mixture of software and hardware with an Internet connection companies are sending the necessary information across the enterprise and get connected with the associate companies and with the other related organizations (Davenport, 1998; Chandrashekar and Schary, 1999).

This can link different types of computer hardware, including mainframes, servers, PCs, mobile phones, and other handheld devices, and it includes public infrastructures, such as the telephone system, the Internet, and public network services.

In the mid-1970s, researchers began to notice that a number of firms were gaining competitive capabilities by utilizing information technology systems to bring down costs and increase revenues significantly. Today, the Internet and information technology are being used in most aspects of our daily lives. Firms are certainly not excluded, as almost all of them utilize IT to some degree in their businesses. Some firms also changed their entire business model and enabled customers to order products directly from their Web sites without relying on third party distributors (Simchi-Levi et al., 2003).

It is generally expected that ES implementation should lead to cost reduction, higher levels of service, and profit increases (Stroeken, 2000; Simchi-Levi et al., 2003), since IT is an important enabler of an effectively integrated supply chain (Simchi-Levi et al., 2003). The discussion of ES for supply chains will include systems that are internal to an individual company as well as external systems that facilitate information transfer between companies, both upstream and downstream.

Although there is substantial, positive theoretical support to achieve business improvements by employing ES, the main concern of managers regarding the cost effectiveness of ES implementation is whether it would lead to
a significant return on investment. It is noted that ES implementation is expensive and could cost a substantial amount of money depending on the level of implementation, applications, and the size of the corporation. For instance, by installing advanced tracking systems, transportation companies would be able to offer detailed information to their customers, but the main issue is whether their clients would actually want to receive such detailed information (Simchi-Levi et al., 2003). Therefore, it is important to analyze what each component can contribute to the enterprise and its partners, and then plan the investment according to specific needs of the company and the demands of the industry (Simchi-Levi et al., 2003).

The strategic use of information technology has been the most predominant research topic since the early 1980s (Sung, 2008). Although practitioners and scholars emphasize the importance of information technology, IT’s actual contribution to firm performance has been controversial (Sung, 2008). More and more firms adopt innovative technologies; therefore, executives and managers are becoming increasingly concerned about the actual ES contribution to the firm performance (Sung, 2008). Some scholars claim that ES could be a threat to firms instead of an opportunity (Sung, 2008). The costs of IT adoption may yield little or no return, but the costs of not adopting may be significant enough to justify the investment (Sung, 2008). It is evident that managers should not view IT adoption as a business project but rather as a competitive weapon that is needed to stay in business.
Supply Chain Systems helps businesses manage relationships with their suppliers. According to Kenneth these systems are supporting the inbound and the outbound supply chain partners like raw material suppliers, purchasing firms, distributors, and transport facilitators. It shares the information about orders, production, inventory levels and delivery of products and services so that they can make better decisions about how to organize and schedule sourcing, production and distribution. The objective of implementing the supply chain systems is to get the right amount of their products from their source to their point of consumption with the least amount of time and with the lowest cost (Kenneth et al., 2010).

Supply Chain Systems are one type of inter-organizational systems because they automate the flow of information across organizational boundaries (Kenneth et al., 2010).
2.7 Enterprise Resource Planning

Enterprise Resource Planning (ERP) systems are operational IT systems that gather information from across all functional areas of a firm to enable the organization to monitor the flow of materials, orders, schedules, the finished goods inventory and other information. ERP systems provide a superior scope for supply chain decisions (Hendricks et al., 2007; Jacobs and Weston, 2007).

A large organization typically has many different kinds of information systems built around different functions, organizational levels, and business processes that cannot exchange information automatically because data formats and databases are not standardized. Managers could have a hard time pulling together the data they need to obtain an overall picture of the organization’s operations. For example, sales personnel might not be able to recount the time they placed an order, whether the items ordered are in stock, customers cannot track their orders, and manufacturing firms cannot communicate effectively with finance to plan for new production. This disintegration of data in hundreds of divided systems degrades organizational efficiency and performance (Sodhi, 2000; Umble et al., 2003; Yeh, 2007). ERP provides companies the flexibility to respond quickly to customer requests while producing and stocking inventory only with what is needed to fulfill existing orders. Their ability to facilitate accurate and on-time delivery, minimize costs, and increase customer satisfaction adds to the firm’s profitability (Nicolaou, 2004; Tsai et al., 2007; Häkkinen, 2008).

ERP systems are quite capable of monitoring transactions but generally lack the analytical prowess to establish which transactions should occur. For that reason, they reside more in the operational area of the firm’s IT map than in the planning or strategic areas (Mabert et al., 2000; Fjeldstad and Ketels, 2006; Velcu, 2007; Tarantilis, 2008). However, ERP providers have begun to offer analytical modules in their packages. ERP allows systems to track orders through the entire company from procurement to delivery. The ability to maintain visibility of orders, and foster broad visibility in general, has become more significant as supply chains become globalized and more complex (Meier and Humphreys, 1998; Stratman, 2007; Velcu, 2007).
Today’s development, using a product- rather than a functional-based organizational structure has also helped make ERP system more attractive, since this configuration increases the importance of the cross-functional scope ERP systems provide (Mabert et al., 2000; Akkermans et al., 2003; Beheshti, 2006).

Characteristically, ERP systems have many modules, each addressing different functions like finance, logistics, manufacturing, order fulfillment, human resources, supplier management etc within a company. These modules are linked together so that users in each function can see what is happening in other areas of the company. There are several key modules to an ERP system, each of which can be installed on its own or in combination with other modules:

ERP systems not only allow a company to track items throughout the system, but they also allow the company to automate its processes. By automating processes, companies are often able to boost efficiency and reduce errors. This arrangement can result in significant cost savings if executed properly. It is important to keep in mind, however, that automating poor processes only guarantees that they will be executed poorly each time. Therefore, firms should review their processes before implementing ERP systems (Tarn et al., 2002; Yeh, 2007).

Installing an ERP system often serves as a catalyst for a firm to redefine its processes and make them more effective. ERP vendors build different versions of their software packages for different industries, which are compatible with that industry’s functional requirements. These different versions contain a variety of options for each function, process, or tasks are performed. One example is a scheduling module for a discrete manufacturing plant. By installing this module, the manufacturer can use the scheduling capabilities in the module to replace its existing scheduling system in order to achieve optimum standardization, which is important in today’s modular manufacturing systems (Motwani et al., 2002; Beheshti, 2006; Terpend et al., 2008).

On the constructive side, these functions, such as the scheduling module discussed above, are often coded with the best practice processes that can significantly improve the way a firm does business. Through the installation of an
ERP system, a firm may be able to learn new best practices and increase its operational effectiveness (Dechow, 2005; Gargeya and Brady, 2005).

As well, there can be a downside to the prewritten processes in ERP software. Even though they are modified, these systems are normally difficult to change. Therefore, if there is a better way of performing a function which is not coded into the ERP system, those superior processes can be fairly hard to implement. It is not unusual for firms to change their processes frequently to fit the ERP way of doing things, although they realize that this is not the best way to operate for their particular situation. Therefore, for the sake of visibility of information, firms may be forced to adopt less effective procedures (Umble et al., 2003; Jacobs and Weston, 2007; Tsai et al., 2007; Yeh, 2007; McAfee and Brynjolfsson, 2008).

On the whole, where ERP systems perform extremely well is in the broad scope they provide in real time. This is so striking to customers that the ERP industry saw growth rates of between 30% and 40% percent in the mid- to late-1990s. Nevertheless, growth has slowed as the market has become saturated, particularly within the world’s largest manufacturing companies. In summary, ERP systems are very effective at telling a company what is going on in its supply chain, because they are operationally focused, yet they fall short in actually helping a company determine what ought to be going on in the supply chain because they do not include sufficient analytic capability (Davenport, 1998; Motwani et al., 2002; Akkermans et al., 2003; Umble et al., 2003; Beheshti, 2006; Tsai et al., 2007; Velcu, 2007).

ERP systems were developed to offer an integrated view of information across functions within a company and with the potential to traverse companies. The broadened scope of visibility along the horizontal axis is a significant characteristic of ERP, and it is also the main reason why the ERP industry was so successful during the mid and late 1990s. Within a company, an ERP system will provide visibility of both incoming supplies and orders so that manufacturing managers can be sure that when they schedule production, demand will be met and appropriate materials will arrive on time. The salespeople in a company can
view production schedules and inventory levels in order to determine when a product might be delivered to a customer (Davenport, 1998; Yeh, 2007).

ERP systems can also generate the opportunity to share data across firms so that managers have visibility across the entire supply chain, even though few companies has reached this stage of implementation. Nonetheless, this broad scope of visibility is the largest benefit offered by ERP systems because it allows the company and supply chain managers to make much better decisions. In terms of the vertical axis, ERP systems tend to focus on the operating level and do not include sufficient analytical capability to help with decisions in the planning and strategic phases. They are great at telling managers what is going on but not particularly adept at telling them what should be going on. For instance, an ERP system can tell a manager the current inventory levels for a product in a particular warehouse; however, ERP systems are weak when it comes to determining how much inventory should be purchased to meet a certain level of demand.

2.8 Information Technology Applications for Supply Chain Management

Information technology (IT) is an important enabler of efficient supply chain management, and many IT applications have recently gained popularity. This is due to their ability to facilitate, coordinate, and integrate the flow of information across the supply chain.

2.8.1 Electronic Data Interchange Application

Electronic data interchange (EDI) refers to a computer-to-computer exchange of business documents in a standard format (see Table 2.4 for its relationship to the different industries). EDI encompasses and describes both the practice and the capability of communicating information between two or several organizations electronically compared to classical methods, such as a letter, fax, and phone. Thus, not only is the practice of linking together the computer systems of different partners for better communication a key component of EDI, but so is the capability of an organization to willingly share and utilize effectively the information exchanged.
When using EDI, firms place orders to distributors and vendors when there is a shortage of product in the warehouse or on the shelf. In this process, a buyer is typically responsible for ordering hundreds of items each week, with those orders being placed once or twice weekly. The EDI process generally uses the existing purchasing infrastructure when using this electronic medium. EDI provides some advantages over traditional purchasing systems by eliminating the paper trail, reducing the ordering lead time, and establishing direct connections with suppliers. It allows the members of a supply chain to share information on invoices, orders, payments, inquiries, and scheduling among all channel members, thus creating benefits by quick access to information, better customer service, improving tracing and expediting, billing, and other activities (Handfield and Nichols, 1999).

### Table 2.4: EDI Standards and Formats

<table>
<thead>
<tr>
<th>Industry Specific Standards</th>
<th>Non-Industry Specific Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>VDA-Automotive industry</td>
<td>EDIFACT-Electronic data interchange for administration, commerce and transport-standard in commerce documents</td>
</tr>
<tr>
<td>SEDA-Retailing and commerce</td>
<td></td>
</tr>
<tr>
<td>SWIFT-Financial business(banks, insurance)</td>
<td>ODA/ODIF-Office document architecture, standard in office documents</td>
</tr>
<tr>
<td>GAEB-Construction industry</td>
<td></td>
</tr>
<tr>
<td>ETIM/ELDANORM-Electronic industry</td>
<td></td>
</tr>
<tr>
<td>DATANORM-Distributor and retailer business</td>
<td></td>
</tr>
</tbody>
</table>

*Source: Adopted from Pejvak, O, 2009.*

Some authors argue that EDI can be used to create a competitive edge (Galliers *et al.*, 1995; Beheshti, 2004). Table 2.5 lists some of the potential benefits associated with the use of EDI systems as opposed to traditional purchasing systems (Bowersox and Closs, 1996; Murphy and Daley, 1996; Handfield and Nichols, 1999; Bowersox, 2000).
Nevertheless, the results of using EDI technology have been mixed. In general, EDI improves productivity through faster information transmission as well as reduced redundancy in information entry. However, EDI systems are still very expensive and costly to maintain.

Many of the organizations that has used EDI have observed little or no impact on organizational performance. For example, Carter (1990) noted that most firms that implemented EDI did not achieve the expected level of cost savings. Erickson (1990) reports that few companies has realized significant cost savings or other benefits from EDI.

Wallace (1988) found that 95% of survey respondents could not identify any advantages associated with the use of EDI. Hollis (1991) concluded that the EDI systems in most companies are largely underutilized, while other researcher, such as Riggins and Mukhopadhyay (1994), stated that the cost of developing EDI systems is often greater than the expected benefits. Many researchers state that it is hard to relate EDI directly to superior performance (Carter and Frendall, 1990; Erickson, 1990; Hollis, 1991; Riggins and Mukhopadhyay, 1994).

### Table 2.5: Benefits of Electronic Data Interchange

<table>
<thead>
<tr>
<th>Quick access to information</th>
<th>Cost efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Better customer service</td>
<td>Competitive advantage</td>
</tr>
<tr>
<td>Reduced paper work</td>
<td>Improved billing</td>
</tr>
<tr>
<td>Better communication</td>
<td>Reduced labor and materials cost</td>
</tr>
<tr>
<td>Increased productivity</td>
<td>Reduced IT telecommunications cost</td>
</tr>
<tr>
<td>Improved tracing and expediting</td>
<td>Reduced clerical cost</td>
</tr>
</tbody>
</table>

*Source: Own Compilation.*

Nowadays, a new and cost-efficient alternative for SMEs is offered by Web-EDI. Here, the EDI application is not an in-house system. Rather, it is achieved via Internet access, which allows HTML or Java documents and forms to be processed and posted to an external hosting system. This ultimately converts the documents and transfers them to the EDI system of the customer or supplier.
2.8.2 Internet and Supply Chain Management

Most of the literature related to the Internet implementation has been anecdotal or case-oriented in nature. This section of the literature review will highlight some of those cases and the effectiveness of Internet in practice.

The Internet did not trigger the increasing velocity and randomness being seen in the supply chain. On the contrary, major retailers and manufacturers have been using inter-organizational information systems to order goods and share information with vendors and suppliers for decades. Before the Internet, supply chain coordination was challenged to some degree by the difficulties associated with making information flow smoothly among disparate internal supply chain systems for purchasing, materials management, manufacturing, and distribution. There are some difficulty in sharing the information with external supply chain partners because the systems of suppliers or logistics providers are based on incompatible technology platforms and standards.

Enterprise systems could supply some integration with internal supply chain processes, but they were not designed to deal with external supply chain processes. With older systems, such as EDI, the format in which data exchanged is limited and the rate of data transmission is slow, making the technology not well suited for build-to-order production models (Arnst and Baker, 2008). The Internet is less cost prohibitive and allows almost everyone in the supply chain to exchange data affordably. The Internet is more flexible than traditional EDI systems in allowing organizations to exchange a greater amount of information, with greater detail, and at faster speeds.

The Supply Chain activities are integrated through Internet, by using intranet the coordination among the internal supply chain processes will be high and by using extranet the coordination can be enhanced with the external supply chain processes (see Figure 2.3). By using intranets and extranets, all members of the supply chain become able to communicate with each other instantly, using an up-to-date information to adjust purchasing, logistics, and manufacturing schedules. A manager can use a Web interface to tap into suppliers’ systems and determine whether inventory and production capabilities match demand for the firm’s product. Business partners will use Web-based supply chain management
tools to collaborate online regarding forecasts. Many firms have international suppliers from different countries, and the Internet helps them coordinate overseas sourcing, transportation, communication, and other issues with customs regulations.

Figure 2.3: Intranet

![Intranet Diagram]

Source: Own Creation

There are also few problems associated with the Internet, the primary challenge being the security issues that surround the exchange of confidential information. The Internet can exchange some types of confidential information, such as e-mail, banking and finance information, but it does not have the ability to protect all of the transactions a business must use to conduct commerce. Since the ability to protect transactions is rather limited, fewer than 1 in 5 businesses are willing to adopt the Internet to exchange sensitive and crucial data (Arnst and Baker, 2008). The cost and labor requirements associated with maintaining a security system for Internet-based transactions can be high for organizations that adopt the technology.

Additional problems faced by corporations that use the Internet to exchange information are its unreliable nature and difficult system administration. By offering data in multiple forms and varieties, data are exchanged in a non-standardized format, which can create problems for those interpreting such data.
The transmission of data in non-standardized forms forces organizations to have on-site staff to update Web pages continually for data exchange in addition to the traditional personnel involved with purchasing functions.

### 2.9 Supply Chain Integration

As discussed earlier, global competition compels managers to seek relentlessly unique competitive approaches in their business. Integrating the supply chain has been found by scholars and practitioners to be a critical factor for companies to stay ahead of their rivals (Tarn et al., 2002; Simchi-Levi et al., 2003).

In order to grasp how the integrated supply chain advances competition capabilities, the structure of supply chain network is described. It consists of a focal firm, its suppliers, and customers as displayed in Figure 2.4. All of the boxes in Figure 2.4 represent members of the supply chain network so that the membership is not limited only to one supplier, focal firm, and one customer. Firms on the supplier side are also known as upstream whereas those on the customer side are called as downstream.

**Figure 2.4: Supply chain network structure**

*Source: Lambert et al., 1998*
Figure 2.5 illustrates the evolution and structure of the integrated supply chain. In 1997, Fisher stated that the supply chain performs two principal functions: a physical function, which is primarily about inventory management and logistics, and a market mediation function, which is concerned with matching demand and supply (Fisher, 1997). In this regard, the supply chain is a network that consists of suppliers, manufacturers, distributors, retailers, and customers (Akkermans et al., 2003).

Figure: 2.5: The Evolution of the Integrated Supply Chain

This network supports three types of flows at the operational level: financial flows, which represent payment schedules, credit terms, and title ownership arrangements; Information flows, which represent order tracking, order transmission, and coordinate the material flows; and Material flows that represent physical product flows from suppliers to customers, as well as the reverse flows for product returns, servicing, and recycling (Akkermans et al., 2003).

Three pillars support the network: processes, which embed the firm’s capabilities in knowledge management, logistics, and new product development; organizational structures, which include management approaches, performance
measurement and reward schemes; and enabling technologies, which include both information technologies and processes (Akkermans et al., 2003). In order for companies to market their products and services successfully in today’s global business environment, they must work together and collaborate with each other to sustain their competitive edge. Due to advances in information and communication technologies, e-supply chain management has made it possible for companies to use their supply chain network as a competitive weapon. According to (Lee, 2005), the supply chain management is the major system implemented commonly in the business today, so the competition today is based on supply chain versus supply chain rather than business versus business. In fact, there is a growing body of literature that addresses the importance of integrated supply chain strategy (Frohlich and Westbrook, 2001; Kim, 2006a; Kim, 2006b). As acknowledged by different researchers, the key factor for remaining competitive in market is the effective integration of suppliers (Eisenhardt and Tabrizi, 1995; Ragatz et al., 1997; Birou and Fawcett, 1998).

The benefits of an integrated supply chain can be realized through efficient linkage among various supply chain activities, and that linkage should be subject to the effective construction and utilization of various supply chain practices. This means that a firm pursuing the effective construction of SCM practices must pay attention to Supply Chain Integration. SCM practices implemented to achieve superior supply chain performance require internal cross-functional integration within a firm and external integration with suppliers or customers to be successful (Narasimhan, 1997). Individual supply chain practices cannot improve their own efficiency and effectiveness since they are achievable through the interaction of different members in the supply chain (Dawe, 1994; Kim, 2006a). Substantial previous research highlighted that many opportunities associated separately with supply integration. Although the theoretical integration of customers and suppliers has been recommended constantly, only lately, because of advances in the Internet and new technologies, has doing so become practical. Before the emergence of the Internet, real-time supply and demand information and inventory visibility were understandably infeasible to achieve, and most supply “integration” was simply a concoction of facilities of Electronic Data Interchange (EDI), telephoning, and faxing (Bowersox, 2000; Frohlich and Westbrook, 2001). However, with the
advent of the Internet, which is broadly available via Web-based technologies, it is now possible to have strong customer and supplier integration for strategic planning, to include demand forecasting, order and inventory scheduling, marketing and customer relationship management. Thus, SCM systems have become more sophisticated and much more efficient (Dehning et al., 2007; Slone et al., 2007).

Figure: 2.6. An Integrated Model of the Supply Chain

Examining the figure below, it is clear that the supply chain network is more concrete (see Figure 2.7), which shows the path over which materials from suppliers are converted into products by a manufacturer. Then, they are stored and distributed by distributors to retailers before finally reaching the end customer. If a product is returned by a customer, then it travels from downstream to upstream. For this reason, the information, product, and finances flow between the members of the supply chain network in both directions (Min and Mentzer, 2004).
Designing and implementing the most favorable supply chain is quite complex due to its dynamics and the conflicting objectives employed by different facilities and partners. Major companies like Tetra Pak or ABB have implemented the supply chain integration concept and found successful, it improves the performance in the market and also in the financial activities (Simchi-Levi et al., 2003). The level of integration is divided into four different stages. The first level is internal integration; the second is integration with suppliers; the third is integration with customers; and the fourth integration level is full integration, both up- and downstream. The first two strategies are described detail in following sections; last two are excluded from the study because of no scope.

The supply chain integration strategy creates value for the firm’s customers and draws suppliers and customers into the value creation process (Tan and Kannan, 1998; Vickery et al., 2003). Frohlich and Westerbrook (2001) described that the most powerful and esteemed competitors are those who link their customers and suppliers together into integrated networks. They also introduced four strategies, which have been identified for supply chain integration, as illustrated in Figure 2.8. The first strategy is very limited, and integrates only internal processes by automating and standardizing each internal function of the firm; there is little to no integration among customers and suppliers. Nevertheless, it is very important to achieve a high integration level in the company (Kim, 2006b). The second strategy is integrating the firm with its suppliers, which can be achieved by information sharing and strategic linkage with suppliers. The third strategy is integrating the firm with its customers. In general, this is about the backward coordination of information and the flow of data from customers to
suppliers (Frohlich and Westbrook, 2001). A firm is fully integrated when it has demand and supply integration that proceeds in both directions.

**Figure: 2.8. Levels of Supply Chain Integration Strategies**

<table>
<thead>
<tr>
<th>1) Integrated with Suppliers</th>
<th>4) Fully Integrated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suppliers → Firm ← Customers</td>
<td>Suppliers → Firm ← Customers</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2) Integrated Internally</th>
<th>3) Integrated with Customers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suppliers → Firm ← Customers</td>
<td>Suppliers → Firm ← Customers</td>
</tr>
</tbody>
</table>

**Source:** Adapted from Frohlich, 2002.

### 2.9.1 First Level of Integration: Internal Integration

In an organization with no integration level at all, every division and department have a separate system for handling the information at hand. In most of these cases, only the staff within that specific department has access to that system and information. Consequently, the flow and accessibility of information in such organizations are very poor and handled ineffectively.

**Figure 2.9: Information System before Integration**

**Source:** Adapted from Simchi-Levi et al., 2003.
Often, the same information is stored in different places in the company or in different departments. These systems are highly inefficient and in many instances contain redundant and inaccurate data (Simchi-Levi et al., 2003).

Conversely, the idea behind integrated supply chain management is to connect these different information systems into one system and grant members from different department access to all data from a single point (see Figure 2.10). Standardized data formats and a centralized information system would help companies to communicate and do business in less time and at a lower cost (Simchi-Levi et al., 2003). Additionally, the literature highlights many different opportunities with this system that are associated with either upstream or downstream integration (Frohlich and Westbrook, 2002).

**Figure 2.10: Integrated Information System**

![Integrated Information System](image)

*Source: Adapted from Simchi-Levi et al., 2003.*

To make the most of information within the supply chain network, several steps are recommended regarding the collection of accurate information on each product to the delivery point. These include having accessibility to all data and using the appropriate tools for its analysis, and sharing the data for collaboration purposes. Thus, the collaboration with other supply chain partners will allow companies to be prepared for and manage uncertainty. The information
technology solution plays a crucial role, and the ultimate aim of IT in the supply chain is to link the point of production seamlessly with the point of delivery. This information flow allows planning, tracking, and estimating lead times based on real data. Any member of the supply chain network that has an interest in the whereabouts of the product should have access to this information (Simchi-Levi et al., 2003).

**Figure 2.11: Goals and Means of Integrated Supply Chain**

![Image of a diagram showing the goals and means of integrated supply chain]

*Source: Adapted from Simchi-Levi et al., 2003.*

Integrated information systems enable all functional areas within the firm to access and transmit information from one area to another, thus facilitating horizontal or inter-firm linkage within an organization. The cross-functional units strengthen this linkage, and collaboration between these units decentralizes the decision-making process, accelerates it, and increases cooperation among the different parties (Vickery et al., 2003). Other examples of the literature have highlighted that cross functional teams for internal integration have a positive effect on marketing and logistics performance (Stank et al., 1999).

A growing body of literature has suggested that firms that are partly or entirely disconnected from other members of the supply chain are in the first level of integration. These firms are generally organized functionally and with a low degree of integration; they do not have comprehensible and consistent supply
chain management. Furthermore, these firms usually do not have qualified supply chain leadership and measurements aligned with their objectives and goals (Salmon, 1993; Simchi-Levi et al., 2003; Vickery et al., 2003; Powers and Hahn, 2004; Rabinovich et al., 2007).

2.9.2 Second Level of Integration: Integration with Suppliers

Many researchers have confirmed that integrative information technologies (integrative IT) increase the flow of relevant information amongst process participants to facilitate the integration of processes that transcend functional, and in some cases, firm boundaries. Computerized production systems serve to integrate manufacturing activities into an overall planning system that typically stretches beyond the boundaries of the manufacturing unit (Lewis and Talalayevsky, 1997; Vickery et al., 1997; Narasimhan and Carter, 1998; Walton and Marucheck, 1998; Tracey et al., 1999; Walters and Lancaster, 2000). Key examples of such systems are Enterprise Resource Planning (ERP), which we will look at closer in this chapter.

As was mentioned earlier, Michael Porter (2004) calls “vertical integration” firms’ integration with suppliers and customers (Porter, 2004). The Vertical integration is accomplished in two forms: forward or backward. Forward integration is when a firm integrates with its customers while backward is with its suppliers. Ideally, a firm should do both for maximum efficiency.

A premeditated collaboration between the focal firm and its suppliers constitutes a mutual, ongoing relationship that engages a high level of trust, commitment over time, long-term contracts, joint divergence resolution, and the sharing of information, risks, and rewards (Vickery et al., 2003). Both sides work together to ensure high product quality and low costs, which leads to sharing higher benefits. Supplier partnering may enhance firms’ competition capabilities, which may form an uncertain block for potential entrants (Stroeken, 2000). Cooperation with trustworthy suppliers is becoming increasingly important for firms. For that reason, the larger companies make fixed and reliable agreements about supplies, usually with smaller companies that are able to function as main suppliers (Stroeken, 2000). The strong vertical relationships with a limited number
of suppliers are strengthened and facilitated by different ES, such as Electronic Data Interchange (EDI) and ERP (Stroeken, 2000). New technologies lead to more efficient logistics members of the supply chain and will, for instance, enable them to go through the design and process stages in less time (Stroeken, 2000). As mentioned, integration with suppliers is the second integration level, and companies that use this strategy have higher degrees of organized functionality. The integration of functional information with suppliers leads to decreased inventory and improved efficiency in their communications by having accurate information about materials in almost real time (Simchi-Levi et al., 2003).

2.10 Competition Capabilities

Intensifying global competition, rapidly changing markets and technology, and escalating involvement and improbability are creating a new competitive environment (Board, 1986; Bayus, 1994). These factors are causing firms to consider carefully a shift from industrial systems driven by efficiency and enabled by hard automation to new systems, where success depends on quick response to customer demands for customized, high quality products. In the post-industrial environment, high quality and consistency, on-time delivery, improved customer service, rapid new product development and introduction, flexible systems, and efficient capital deployment rather than cost reduction are the primary sources of competitive advantage (Skinner, 1969; Skinner, 1986; Doll, 1987; Goldhar, 1991; Hayes, 1994; McCutcheon, 1994; Roth, 1996).

The design of manufacturing systems should focus on developing competitive capabilities that satisfy customer needs and improve performance (Ward et al., 1994). Firms also pursue CC within standard strategies for competing on price, quality, time, flexibility, innovative marketing, or service differentiation according to their supply chain’s structure, the nature of their business, and their competitive environment (Kim, 2006b). In his book “Competitive Advantage,” Michael Porter (1998) explains competitive strategy in an efficient way. The central theme of his book is how a firm can actually create and sustain a competitive advantage in its industry, and how it can implement Porter’s proposed broad generic strategies. While he builds a bridge between
strategy and implementation, his focus is more on strategy development and less on implementation, the latter of which has been the subject of much previous research in the field. Porter’s competitive strategy classification has been used by many authors and researchers, and it offers three generic strategies: cost leadership, differentiation, and market focus (Bowersox and Daugherty, 1995).

Indisputably, Michael Porter’s theory of generic competitive strategy is among the most substantial and powerful contribution to the study of strategic behavior in organizations (Porter, 1998). In today’s hyper-competitive environment, firms constantly compete along several competitive dimensions (Swafford et al., 2006). The business environment experiences a competitive environment that is much more demanding, especially due to the present global financial problems and demand elasticity. However, the competitive advantage in the business is at the heart of its performance, which determines the appropriateness of the activities that can contribute to their performance, such as innovations, cohesive culture, or effective implementation of different systems and applications (Porter, 2004). In essence, the theory contains two elements; first, a scheme for describing firms’ competitive strategies according to their market scope (focused or broad) and their source of competitive advantage (cost or differentiation) and second, a theoretical proposition about the performance outcome of these strategic designs.

2.10.1 Linkage between Competition Capabilities and Supply Chain Management

The strategic part of supply chain management (SCM) necessitates consideration of the possible implications of efficient linkages between corporate competitive capability and supply chain strategy in order to develop logical and integrated strategies. SCM can be referred to as the strategy outline of statements associated with sourcing products, demand management, capacity planning, the conversion and distribution of finished products, communication, and delivery. Seeing these as the main business processes associated with producing a company’s product, it is significant to link them to the capability of the entire business. In other words, a firm is obliged to develop strategic capabilities in order to manage the supply chain, which is the foundation for achieving high-level
competitive capabilities. A set of detailed strategies should be developed for each process within the supply chain. In addition, a good understanding of the connection between corporate competitive capability and supply chain strategy is required when these strategies are developed.

Nevertheless, the essential point is that SCM assertions should be strategic and must be associated with a firm’s business strategy and capability. The literature has not been consistent in showing the interactive relationship between competition capability and SCM strategy or between firms’ competitive capability and supply chain strategy. A reasonable explanation for this discrepancy may be the failure of empirical studies to address specifically the continuation, role, and potential benefits of a strategic “switch.” Here, the firm’s competitive and supply chain strategy capabilities can be used to improve the chances for its success. For that reason, there is a need to investigate variables to clarify the interactive relationship between corporate competitive capability and the supply chain strategy, and therefore to learn whether the interactive relationship could be influenced by such moderating variables. This means that a firm is tracking the efficient linkage of supply chain capabilities and strategies requirements as it considers supply chain integration. The practical capabilities of a supply chain are executed to accomplish superior supply chain performance (cost, quality, flexibility, and delivery performance). This necessitates internal cross-functional amalgamation within a firm, and external integration with suppliers and/or customers (Phillips et al., 1983; Narasimhan, 1997; Wisner and Tan, 2000; Powers and Hahn, 2004; Kalra and Soberman, 2008).

These observations recognize that supply chain integration intended to pursue these capabilities may fluctuate in scope and prominence. In other words, the role and advantage of supply chain integration as a strategic switch for the interactive relationship that connects corporate competitive capability and supply chain strategy can be diverse depending on the stage of supply chain integration (Stevens, 1989; Narasimhan and Jayaram, 1998; Jayaram et al., 2000).

Stevens (1989) states that as the phase of integration shifts from independent operation and functional integration to internal and external
integration, the focal point of competition capabilities would move from operational and tactical to strategic features.

2.10.2 Linkage between Competition Capabilities & Performance

The literature on strategic management has long stressed the significance of the relationship between competition capability and functional level strategies for corporate performance. Research has shown that firms operating in the same market segment and following comparable strategies could have noticeably different levels of performance (Cool and Schendel, 1988; Lawless et al., 1989; McNamee and McHugh, 1989; Klassen and McLaughlin, 1996; Stabell and Fjeldstad, 1998; Nicolaou, 2004; Powers and Hahn, 2004). This might be clarified by differentiation in the strategies and competition capabilities between the corporate and functional levels. That is, significant differences in competition capabilities and supply allocations could exist across companies that are pursuing the same strategies, and such distinctions could have a significant impact on corporate performance (Narasimhan et al., 2001). Briefly stated, “insufficient” reliability in the strategy and capability that link the corporate and functional levels could lead to substandard corporate performance while better reliability could lead to superior corporate performance (Narasimhan and Carter, 1998).

Observed from this standpoint, the configuration between functional level supply chain capability and corporate level competitive capability is very important. Watts and colleagues (1995) emphasize that the SCM function should play a significant role in determining the competitive capability of the firm in its marketplace. Other researchers noted that supply chain strategies and competition capabilities should be used to support business strategies and facilitate the achievement of superior competitiveness of the firm (Watts et al., 1995; Narasimhan and Carter, 1998).

Morash (2001) pointed out that supply chain management is certainly a building block for supply chain strategy and a foundation for the competition capability needed for a firm to achieve superior performance. Dangayach and Deshmukh (2001) also state that companies able to manage more efficiently the capabilities and resources associated with SCM are positioned to increase their
competition capabilities and achieve superior performance. The logistics capability approach emphasizes that when main strategic supply chain capabilities and resources are important, continued competition capabilities can be acquired (Shang and Sun, 2004; Dehning et al., 2007). Lynch and colleagues (2000) recognized empirically that superior firm performance is achieved when logistics capabilities are coordinated suitably with certain competition capabilities.

2.10.3 Forces of Competition Capabilities

The extensive acceptance of Porter’s model by researchers is apparent in the wide variety of its applications. These applications embrace industries as diverse as shipping (Brooks, 1993) and banking (Median and Chin, 1995), and countries as diverse as Ireland (McNamee and McHugh, 1989), Portugal (Green et al., 1993), Korea (Kim and Lim, 1988), and the People’s Republic of China (Liff et al., 1993). The model has also been used extensively by researchers studying the interaction between firms’ competitive strategies and other features of management; i.e., their human relations strategy (Schuler and Jackson, 1989); information technology (Huff, 1988); industrial engineering (Petersen, 1992); manufacturing strategy (Kotha and Orne, 1989); logistics (McGinnis and Kohn, 1988); environmental scanning (Jennings and Lumpkin, 1992); planning process (Powell, 1994); and management selection (Govindarajan, 1989). The framework has also been used comprehensively to structure managers’ perceptions about their firms’ strategies.

Porter (2004) asserted that the rules of competition are represented in five competitive forces in all industries, whether the firm produces products or services, or it is domestic or international. The five forces follow these lines: the entry of new competitors, threat of substitutes, the bargaining power of buyers, the bargaining power of suppliers, and the rivalry among the existing competitors (illustrated in Figure 2.12). The ability of firms in an industry to produce, on average, a rate of return on investment is determined by the combined strength of these five competitive forces, which vary from industry to industry and can change as an industry develops (Porter, 2004).
The paradigm’s theoretical propositions have also motivated intense debate. Early challengers argued that choosing between cost- or differentiation-leadership could result in inferior performance, which is the so-called “stuck in the middle” hypothesis (Karnani, 1984; Hill, 1988; Murray, 1988). The challengers argued that conditions which might favor cost-leadership (such as the reduction of transaction costs throughout vertical integration, process innovation and learning, and scale effects) were independent of conditions that might favor differentiation (such as consumer preferences, product innovation, and quality differentiation based on the firm’s superiority in a particularly complex value system). For this reason, external conditions provide no reason to discriminate against mixed cost and differentiation-strategic designs (Murray, 1988).

Moreover, when differentiation strategies can be used to expand market share, which in turn permits greater economies of scale and scope, external conditions might favor mixed strategies (Phillips et al., 1983; Hill, 1988). Conditions that have been considered in this way include the particular nature of retailing against manufacturing industries (Cappel et al., 1994) and the distinctive characteristics of an industry’s technology application (Oskarsson and Sjöberg, 1994). These five forces influence the prices, costs, and the required investment for firms in an industry.
Powerful buyers demand products with lower prices; for instance, Tetra Pak, the world largest processing and packaging solutions company for food, requires some of its suppliers to move their factories to China and elsewhere to reduce prices (Berg, 2008). The cost of raw materials and other inputs are unyielding according to the bargaining power of suppliers. The intensity of rivalry affects prices as well through the costs of competing in areas such as plant, product development, advertising, and sales force. Finally, firms must always find ways to remain competitive (Porter, 2004).

Firms always seek to position themselves in the industry based on their profitability. Sustainable competitive capability has been mentioned by Porter, as the primary basis of above average performance in the long run. A firm can have countless strengths and weaknesses, similar to its competitors, and based on them, it can seize two basic types of competitive capability: low cost and differentiation. These result from a firm’s ability to handle these five competitive forces better than its rivals. These two fundamental types, combined with the scope of activities a firm seeks to achieve, lead to the following three generic strategies: cost leadership, differentiation, and focus (illustrated in Figure 2.13) (Porter, 2004).

Fig 2.13: Generic Strategies

![Generic Strategies Diagram]

*Source: www.marketingteacher.com, adapted from Porter, 2004.*
Competitive capability stems from the many distinct activities a firm performs in designing, producing, marketing, delivering, and supporting its products. Each of these activities can contribute to a firm’s relative cost position and create a basis for differentiation. For instance, a low-cost physical distribution system, a highly efficient assembly process, or superior sales force utilization may lead to cost advantage. Alternatively, the procurement of high-quality raw materials or a superior product design can result in differentiation (Porter, 2004).

In order to investigate the sources of competitive capabilities, all of the activities a firm performs, and how these activities cooperate, should be examined (Porter, 2004). All these actions can be represented using a value chain, shown in figure 2.14. The mechanisms of the value chain, which are known as value activities, are defined as follows.

For every reputed organization the usual procedure is followed i.e. input, process and output. For input there are some important processes should be followed, to get the raw materials, proper storage, material handling through inbound logistics, production and operations produce the products, final products are distributed systematically through outbound logistics, the responsibility of Marketing team is to promote the product and get the necessary information from the market, pricing, channel management etc., Human resource team manages the flow of skilled workers, discipline, compensation etc., made necessary changes periodically related to the technology, processes etc. (Porter, 2004). Dissimilarities among competitors’ value chains are a key source of competitive capability (Porter, 2004).
Fig: 2.14: The Generic Value Chain

The connection between the processes performed and its performance within the value chain is called linkage. Optimizing and organizing these linkages can affect competitive capability (Porter, 2004). Porter explained that the linkages connecting a firm’s chain and the value chain of suppliers and other channel members are known as vertical linkages (Porter, 2004).

The value activities have an entity cost structure and could be exaggerated by linkages and interrelationships with supplementary activities, both within and external to the firm. Manufacturing companies compete by reducing the increasing cost of performing valued activities, and the firms that accomplish this gain the cost advantage (Porter, 2004). The cost structure may be affected by the level of vertical integration in a valued activity; therefore, a firm should consider the potential benefits of integration for each value chain (Porter, 2004).

Differentiation strategy is another competitive capability a company may have. This is not limited to differentiating in terms of physical products or marketing practices but also differentiating anywhere in the value chain. Manufacturing firms can only accomplish this strategy if customers value the exclusivity they offer (Porter, 2004). Each value activity has a latent source of

Source: www.cmu.edu, Adapted from Porter, 2004.
uniqueness, and one may affect another (Porter, 2004); e.g., delivery time can be prejudiced by operations, outbound logistics, and order processing. For that reason, the sources of differentiation in the firm’s value chain is often multiple. The overall level of differentiation a manufacturing firm offers to its customers is seen in the increasing value it creates for its buyers (Porter, 2004).

Focus strategy is the third generic competitive strategy, and it rests on the choice of a narrow competitive scope within a manufacturing industry. A firm may select a segment or a cluster of segments in the industry and modify its strategy for serving them to the exclusion of others (Porter, 2004). This means manufacturing firms pursue cost advantage or differentiation in a specific market or with specific products (Kumar et al., 1997).

Porter explained that cost advantage and differentiation are mutually exclusive since differentiation is usually costly, and each element requires a different approach (Porter, 2004 p. 18). However, there is opposition to this view. A stream of literature (Hill, 1988; Miller and Dess, 1993; Kumar et al., 1997) suggests reconsideration of Porter’s guidelines as researchers have found that not only mixed or hybrid strategies are feasible, but that they are also much more profitable in special situations compared to pure strategies. The strategy is viewed fundamentally in this dissertation as the positioning of resources of the firm about its environment in order to achieve desired performance outcomes (Schendel and Patton, 1978).

The development of technology can also influence any value activity in a firm’s value chain; consequently, it can affect competition (Porter, 2004). Since 1990, the relationship between technology and competition has become much stronger (McAfee and Brynjolfsson, 2008).

In concluding this section, the principles of competitive advantage have been discussed, and describes their resources, abilities, environment, and industry, firms pursue, pure or hybrid forms of competitive strategies. Furthermore, technology has a strong relationship with competition.
2.11 Firm Performance

According to Webster’s Dictionary of the English Language (1987), performance is defined as “any recognized accomplishment.” According to Zou and colleagues (1998), one can question whether the obtainable results relating to performance are a consequence either of the variables related to performance or of their operationalization. It is been asserted that performance is one of the least understood areas in international marketing and logistics (Katsikeas et al., 2000; Frohlich, 2002; Sousa, 2004; Dehning et al., 2007; Hendricks et al., 2007) and that the extensive diversity of employed performance conceptualizations have led to inconsistent and conflicting results (Aaby and Slater, 1989; Zou and Stan, 1998; Katsikeas et al., 2000; Sousa, 2004). This is a distinct weakness in extant research resources since it has been argued that, firms which implement robust performance measures will also be benefited from better marketing and managerial performance in general (O’Sullivan and Abela, 2007).

It is also important that rigorous measurement always precede high-level execution and the attainment of world-class results. As important as it is to measure the right things, it is equally important to measure them correctly. When companies measure the right things using the right measures, good things happen. Harvard’s Robert Kaplan has stressed the fact that good decision making requires correct measurement. He identified three characteristics that define “correct” measurement practices, the designed system should generate the relevant information accurately. When managers have this type of information for every value-added process and each valued SC relationship, they can make effective decisions (Kaplan, 1991). When this type of information is properly shared up and downstream in the supply chain, the characteristic collaborative capabilities can be built. On the other hand, inaccurate measurement leads to non-aligned strategies, poor understanding, and contradictory if not counterproductive behavior (Stank et al., 2001; Nicolaou, 2004; Sengupta et al., 2006).

In provisos of assessment, indicators that are based primarily on absolute numerical values are classified as being objective, while concepts that require perceptual or attitudinal input are seen as subjective (Sousa, 2004). Even though both financial and non-financial performance measures can be operationalized in
both objective and subjective terms, it is common that financial measures are objective, whilst non-financial measures are subjective (Zou and Stan, 1998; Lages, 2000).

Regarding the suitability of measuring performance subjectively, this topic has been subjected to some argument, as the methods are at odds in that objective indicators are more direct, while subjective indicators will permit the respondent to measure based on an awareness of a predetermined reference point. Nevertheless, most researchers agree that subjective measures are often very appropriate, given the fact that formal company statements and reports often make no real distinction between the sizes of companies. Inconsistency can also exist between different firms’ measures due to diverse internal accounting practices (Phillips et al., 1983; Katsikeas et al., 2000; Lynch et al., 2000).

Furthermore, managers can view certain data as sensitive information, and consequently be unwilling to reveal specific numbers and figures that relate to firm performance. The stage of strategic goal accomplishment is also very challenging to capture by objective numbers alone (Lages, 2000; Scannell et al., 2000). The suitability of subjective measures is evidenced additionally by the findings in strategic management literature, which highlight the general reliability of subjective performance measures due to their high correlation with their objective counterparts (Venkatraman and Ramanujam, 1986; Venkatraman and Ramanujam, 1987; Venkatraman and Prescott, 1990).

There has also been some argument in the literature concerning the unit of analysis when conceptualizing and reviewing firm performance. Even though most research conducted before the new millennium conceptualized firm performance at the corporate level by focusing on firms’ total production and sales (Katsikeas et al., 2000; Powers and Hahn, 2004), Cavusgil and Zou (1994) have strongly promoted that the proper unit of analysis should be the product rather than the firm. The reason for this is that by using the firm as a unit of analysis, there are risks of imprecise measures of strategy and performance variables, particularly if the targeted firms are large or medium-sized with diversified business portfolios, where some firms might be successful and others unsuccessful (Cavusgil and Zou, 1994; Katsikeas et al., 2000).
Great supply chain companies, such as Dell and Tetra Pak, are dedicated towards measurement. Managers at these companies will explain that SCM’s most important goals, such as SC alignment, outstanding collaboration, and ultimately competitive advantage all depend on effective measurement. Nevertheless, few companies have harnessed the power of measurement (Fawcett and Swenson 1998). They also described this power as “when performance is measured, performance improves. When performance is measured and reported, the rate of improvement accelerates” (Fawcett and Swenson, 1998 p. 198). Managers can capture this accelerated improvement by designing measurement systems to leverage better understanding, behavior, and results.

Managers cannot efficiently control processes that they do not understand, and they cannot fully understand a process without careful and accurate measurement. As in the saying, “if you cannot measure it, you cannot manage it,” it is true for the most basic role of a performance measurement system, which provides insight into the nature and workings of value added processes. This is especially important for supply chain strategy development and implementation (Tan and Kannan, 1998; Kim, 2006a; Rai et al., 2006).

A well-designed measurement system provides feedback regarding customer requirements, the capabilities of the company and its suppliers, and the future success of collaborative initiatives (Cooper et al., 1997; Tan and Kannan, 1998; Tan et al., 1999). This means that measurement creates an understanding of supply chain processes and guides a company’s progress towards real collaboration. In summary, organizations appear to have an extensive range of measures at their disposal for assessing performance. Even though there is some argument about how performance should be conceptualized and what measures should be used, there is also some agreement that such conceptualizations should embrace multiple dimensions and measures in order to capture all of the details of this important and multifaceted construct (Aaby and Slater, 1989; Zou and Stan, 1998; Shoham, 1999; Katsikeas et al., 2000; Lages, 2000).

Still, researchers face two significant challenges in conducting a study on integrated supply chain and its impact on firm performance. First, it is difficult to
measure the firm’s performance and second, justifying the functional relationship between supply chain integration and performance is even more difficult (Ketokivi and Schroeder, 2004). Yet researchers deal with these issues theoretically and empirically.

A recent study was conducted on the impact of enterprise systems on corporate performance by (Hendricks et al., 2007), with a focus on CRM, ERP, and supply chain management. They show the objective performance data on stock returns and accounting metrics. Their analysis of the financial benefits of ES implementation yields mixed results. Another study was done by Dehning and colleagues (2007) on 123 manufacturers during the period 1994-2000. This effort analyzed secondary data by examining the financial benefits of IT investments centered on newly adopted IT-based SCM systems by using Porter’s (1998) value chain model. Dehning and colleagues (2007) showed empirically that SCM systems increase market share, inventory turnover, return on sales, gross margin, and reduce administrative and selling expenses.

Tracey’s (1998) study demonstrated that logistics influences a manufacturer’s ability to satisfy customers and overall performance. Powers and Hahn (2004) claim that competition capability is the best route to a superior performance. Kim’s (2006b) study reveals that competition capability has a positive effect on firm performance only within large firms, and it showed empirically that this connection is not significant within small firms.

There has been some debate on definite answers and findings regarding the results of IT adoption on performance. For that reason, this thesis also investigates that issue, which also has been called by researchers in this field, and shows categorically that a research gap exists specifically within the companies. Table 2.6 provides a list of literature on the empirical studies conducted to investigate the relationship of supply chain integration, competition capabilities, and firm performance in the manufacturing and service sector. The response rate for the studies depicted in Table 2.6, varied from 9% to 45%. Table 2.6 also demonstrates in detail the research method utilized, sample size, context, response rate, research approach, and major findings. A balancing view of performance, as opposed to
considering it solely as financial or non-financial, is to conceptualize performance according to the expected outcomes of the firm’s activities.

2.12 Coffee Cafes and Supply Chain Management

A coffee supply chain is the sequence of stages involved in delivering a coffee product to the final consumer. It includes production (cultivation, harvest and initial processing), roasting, distribution and consumption. The green bean is produced from primary processing of coffee either by the growers or by the secondary processing players like processors, roasters. Since the majority of coffee is consumed in non-producing countries, coffee is exported to the consuming places largely in the form of green beans. Several firms may be involved in the international trade of coffee including exporters, importers and roasters. The trade can also take place directly from grower to the roaster. Moreover, growing and roasting can be vertically integrated into ownership and management. Green beans need to be processed in order to display its aromatic and flavor characteristics. This processing is called coffee roasting and consists of the heating of the coffee that transforms dried beans into roasted coffee products. Finally, coffee is ground and brewed for consumption as a hot or cold beverage (Bharath and Gowda, 2014).

In the Supply Chain of Coffee, Manufacturers, Wholesalers, Suppliers, Retailers and Consumers are involved. The Supply chain describes the suppliers, storage facilitators and modes of transport which are all involved in getting the product from its origin source to the end user (Angola et al., 2012).

The fair-trade system of Starbucks CAFÉ practices (Coffee And Farmers Equity) program contributes the empowerment of marginal workers and producers of Coffee in the global coffee industry. To imply there are four conditions: Empowering the small coffee planters by giving proper training, product quality, economic accountability takes the responsibility of making the payment properly to the coffee farmers, social responsibility is another practice, the company ensure the members of the company are following certain social responsibilities like fair trade system, fair labor system etc. environmental leadership strengthening by applying practices to conserve water, air energy etc. (Macdonald, 2007).
In recent years, the specialty coffee industry has actively focused on the producer. The coffee industry faces two problems. The pricing is done by the commodities market at international level, it is not possible to empower the coffee farmers and the vertical integration of several coffee café companies (Kubota, 2014).

The main feature of SCM is the collaboration between two or more business linking the players of supply chain in coffee production and sustainable local fresh milk, the interchange of information through top-down navigation and SCM oriented design considers the effect of proper decisions on the partners in the supply chain (Knolmayer et al., 2009).

By making use of different supply chain systems leads to the integration of information systems, and there are good benefits to the enterprises after implementing such systems. Information Systems are used in Coffee cafes to manage inventory and Ordering, Business Operations Management, Employee Time Management, Employee Time Management, supplier relationship, POS Software and Customer Enticement. Supply Chain Systems are using an Internet-based Information Technology for specialty coffee. Supply Chain Systems helps coffee cafe companies to build high-performance supply chains. It manages operations, assets and management in all areas, using advanced techniques and real world know-how. Based on open data models the concept of Supply Chain System applications are developed, so the sharing of the data inside and outside of the organization is possible. The storage of the shared data is stored in the database management systems and different websites of the same companies (Bharath & Gowda, 2015).

The products such as cocoa, coffee, cotton or palm oil are traditionally traded by intermediaries, which inhibits the direct interaction between the customer and the supplier. The indirect relationships, combined with the non-descript commodity nature of the product itself; make it difficult or impossible for a customer to track the origins of the merchandise. This is especially so in the case of products such as cocoa or coffee where the supply base consists of the very large number of small scale farmers (UNCTAD, 2013).
In most of the coffee producing regions, the coffee companies are restructuring their supply chain by adding the coffee farmers groups and rural cooperatives so that the integration between bottom up initiatives at farm level or institutional changes at supply chain organizations and bottom up sustainability standards set by the private sectors (Arifin, 2010).

Starbucks, the world’s topmost café industry has implemented Oracle’s GEMMS system. This system manages the flow of supply. In the organization, the automated information system manages the distribution planning, manufacturing scheduling, and inventory control. Starbucks manages multiple distributing strategies in their promotional activities; it sells coffee drinks and also selling grounded beans to businesses such as Airlines, Super markets, Departmental stores and Ice cream makers. The coordination of supply with multiple distribution channels requires timely and accurate information flow about demand, inventories, storage capacity, transportation scheduling and more. The supply system implemented by the Starbucks company are doing all the above with maximum effectiveness and reasonable cost (Turban and Potter, 2003).

In case of coffee industry, the traditional marketing system has been taken over by global supply chain, due in general to the private sector and also market driven forces that influence coffee as a world commodity. The global operations of the coffee industries are very strong, for the purpose of flexibility and providing good services to its customers the integration of the enterprises with the supply chain is strongly needed to expose themselves to the global competition (Ibrahim and Zailani, 2010).

Gayo Coffee Supply Chain System (GSCS) includes many actors of coffee, which begun from coffee farmers including agriculture, harvesting and the primary process of coffee to produce cherry coffee. Hard skin coffee is moved to the collectors and sent to the processors to convert into green coffee beans. In GSCS exporters also acts as the main partners to sell coffee in Japan, USA, Australia, New Zealand, South Korea, and several countries of European Union (Jaya and Machfud, 2014).
To support the business environmental changes there is a shift from the operational level to the strategic level in the Supply Chain Management of food and beverage industries (Jessica, 2007). Starbucks has strategically worked towards building a vertically integrated organization, to keep all the steps in production towards the end product under their own ownership, in order to gain and maintain control over the entire value chain (Brzelins and Johansson, 2012).

In the country like India, the factors of internationalization, an increase in the middle class population, going up disposable money, and lifestyle changes are leading towards the consumption of coffee has increased. This leads the Coffee Café industries to sell coffee drinks and other food and beverages for consumption on the premises or for takeout. Intensifying global competition, rapidly changing markets and technology, and escalating involvement and improbability are creating a new competitive environment. The consumer preferences and income level of the place will decide the competition of the particular market, locations of the outlets is the strategic decision for making high profits by the individual companies. The selection of the places for outlet is the big challenge for the coffee cafes. The accommodation should be big so that more number of customers can sit and chat for long time, in India the customers preferred to sit and drink rather than take away. An essential part of the coffee shop experience continues to be a problem as supply chain players struggle to establish the quality and reliable supplier relationships (Bharath & Gowda, 2015b).

To achieve the competitive advantage, Risk, Uncertainty, strategy, innovation, relationship and technology are the important factors of supply chain management. These are very much implemented in the manufacturing sectors of developed nations. But these concepts are can be implemented to the Agri-Supply Chain in developing nations (Jayaratne et al., 2011).

The demand for the coffee café market is increasing; the consumers visiting cafes and drinking coffee along with snacks are increasing so the service, quality and the value for the coffee and its customers are so important. The integration, collaboration and improving the supply chain management of the coffee café industries around the world is very much required to achieve the success in the market (www.econ.iastate.edu, browsed on 10.08.2014).
The core key factors for the business growth and sustainability are the high product quality, service reliability and management of operations at Starbucks to influence the market share, productivity and profitability. The quality and reliability of the products at Starbucks are the higher priority to improve the market share and customer loyalty (Kioumers, 2011).

Since coffee is largely a globally traded commodity and predominantly large players are involved in trading, the supply chain of coffee is quite complex. The value chain of coffee is typically an example of a buyer driven chain, specifically controlled by large roasters (Ponte, 2001). This is so after the dismantling of quotas and International coffee agreement. Sellers are oligopolistic and buyers are oligopsonistic in nature. They hedge price fluctuations by trading in the futures markets (Almeidia et al., 2009, Upendranadh and Subbaiah, 2012). After the liberalisation in coffee marketing which put an end to the monopoly of the Coffee Board, the roasters and exporters have gained tremendous control on the market. Earlier studies on coffee supply chain in India concluded that there is a lack of vertical integration between the producers and roasters/exporters (Venkatesh, 2011; Upendranadh and Subbaiah, 2012).

The green coffee growers are very much linked to the industrial coffee processors (Roasters, Brand owners) for establishing and managing the origin protection. The coffee supply chain relationship reshapes the geographical indications for value addition (Xiomara et al., 2015).
### Table 2.6: Empirical Contribution In SCM, Competition Capabilities and Firm Performance

<table>
<thead>
<tr>
<th>Study</th>
<th>Research method</th>
<th>Sample and context(response rate)</th>
<th>Research title</th>
<th>Analytical approach</th>
<th>Major findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dehning et al., 2007.</td>
<td>Secondary data between years 1994-2000</td>
<td>123 Manu-USA (20%)</td>
<td>The financial performance effects of IT-based supply chain management systems.</td>
<td>Regression analysis</td>
<td>Implementation of different systems in SCM -gross margin -inventory turnover -market share -Return on sales</td>
</tr>
<tr>
<td>Sengupta et al., 2006.</td>
<td>Survey</td>
<td>73 Manu &amp; 72 Serv-USA (21.8%)</td>
<td>Comparing the manufacturing and service supply chain performance.</td>
<td>EFA, Multiple regression analysis</td>
<td>Findings provide insights into the similarities and differences between the manufacturing and service supply chain</td>
</tr>
<tr>
<td>Kim, 2006b.</td>
<td>Survey</td>
<td>99 Manu-Korea; 137 Manu-Japan (44.8%)</td>
<td>Effects of supply chain management practices, integration and competition capability on performance.</td>
<td>CFA SEM</td>
<td>Efficient supply chain integration may play a more critical role for sustainable performance improvement in small firms. In large firms the close interrelationship between the levels of the SCM practices and competition capability may have a more significant effect on performance improvement.</td>
</tr>
<tr>
<td>Rai et al., 2006.</td>
<td>Survey</td>
<td>110 Manu and Serv-USA (30.55%)</td>
<td>Firm performance impacts of digitally enabled supply chain integration capabilities.</td>
<td>SEM</td>
<td>IT-enabled supply chain integration capability results in significant and sustained firm performance gains, especially in</td>
</tr>
<tr>
<td>Study Description</td>
<td>Research Method</td>
<td>Sample Size</td>
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<tr>
<td>Frolich, 2002</td>
<td>Survey</td>
<td>486 Manu-UK (20%)</td>
<td>Barriers and performance of e-integration in the supply chain. Positive link between e-integration and performance. Internal barriers impeded e-integration more than either upstream(supplier) barriers or downstream barriers (customer).</td>
<td></td>
<td></td>
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<tr>
<td>Frolich &amp; Westbrook, 2001</td>
<td>Survey</td>
<td>322 Manu in 23 countries (20%)</td>
<td>Areas of integration and corporation performance. Demonstrate consistent evidence that the widest degree of integration with both suppliers and customers had the strongest association with performance improvement.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ranganathan et al., 2004</td>
<td>Survey</td>
<td>249 Manu and Serv-North America (20.75%)</td>
<td>An examination of key drivers and performance impacts on assimilation and diffusion of web technologies in supply chain management. Internal assimilation and external diffusion of web technologies significantly affect the benefits realized by SCM in the firms.</td>
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<td></td>
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</tbody>
</table>

EFA-Exploratory Factor Analysis; CFA- Confirmatory Factor Analysis; SEM-Structural Equation Modeling; Manu- Manufacturing firms; Serv- Service firms.

Source: Own Compilation.
2.13 Research Gaps

The research gaps have been identified based on the literature review. The supply chain management of coffee is a long process. Starting from the grower the coffee bean reaches as a product to the coffee cafes. At every stage there is a proper process, so that the coffee changes from one form to the other form. Most of the research related to supply chain management has been made on manufacturing firms. The review of literature was made on different research related to supply chain systems. This is the major system which deals with the supply chain management through computerized systems. Most of the coffee cafes are having this kind of systems, but the factors may differ. Some small studies has been made on computer systems by using few factors related to Café Coffee Day company. The factors chosen for the present study is very detailed for the supply chain systems of café coffee day. The drivers of Supply Chain Systems is another important part of the research, which is derived from different theories of supply chain management, which is mainly connected to the supply chain systems is yet to fully mature into coffee café industries. There is little literature available on Supply Chain Integration of coffee cafes. The factors for deriving Supply Chain Integration are very unique kind of nature in the present study. The supply chain partners of cafe coffee day company are very different than any other reputed cafes of the world. Therefore, there is a lot more scope to contribute in this area. The previous studies were made on either supply chain systems or supply chain integration. For the present study an attempt is made to connect the supply chain systems and supply chain management. By combining the major business factors like competition capabilities and firm performance in terms of supply chain management for Café Coffee Day needs to be studied. It was observed that there is no standard model regarding supply chain management connected to the major business factors like supply chain systems, supply chain integration, competition capabilities and firm performance for Café Coffee Day Company. It needs to be formulated around a specific business context. Therefore there is a need to construct the generic model for the company to implement the newly created concepts of supply chain management by combining the above explained business factors.