Chapter-3

RESEARCH METHODOLOGY AND SURVEY INSTRUMENT

In line with Chapter 2 on literature review and the subsequent Section 2.1 and Section 2.2, this chapter identifies the gap in performance measuring systems from retailers’ and suppliers’ perspective for a retail business. A set of objectives was listed and various scholarly literatures were studied to address these objectives and design a set of testable hypotheses statements. The empirical design and methodology used in this research to test the hypotheses are from both the retailers’ and suppliers’ perspective and are presented in this chapter. Specifically, this chapter aims to elaborate (1) Need for the Study and Objectives, (2) Hypotheses Statements, (3) Research Methodology, (4) Sample Selection, (5) Instrument Design and Data Collection, and (6) An Explanation of Statistical Methods used to analyse the Data.

3.1 Need for the Study

Today most of the organisations are making conscious efforts to change some or all of their core business processes to survive and excel in the highly competitive and complex business environment. The needs and expectations of the customers are getting more and more unstable and difficult to identify. At the same time, today’s customers have many choices, often similar in terms of quality and price. The supply chain process is a core business process of major importance for the realisation of business strategy of an organisation. It determines numerous key performance indicators of an organisation and has a major impact on its profitability and competitiveness. Therefore, supply chain can be considered as the most suitable operational framework for a transformation process to be based on. Every company faces a different set of challenges and issues with respect to transforming their supply chain and integrating with companywide growth strategies. The challenge is to integrate supply chain execution with the overall corporate business strategy and to use the supply chain as a catalyst for business transformation or business reinvention. These challenges are faced by one of the most booming industry in India.
today – the Indian Retail Industry. The backbone of retail business operation is its Supply Chain and Logistics. So far, most of the survey-based researches have not addressed all relevant issues and the findings are not all clear, yet. This study has enough scope to go to the roots of retail supply chain issues and tap the parameters responsible for making a substantial impact on the performance of an organisation. The research work is expected to bring forward understanding of issues relating to supply chain integration, assess the level of logistical integration among the supplier and retailer, and to determine whether a linkage exists between implementation of the integrated supply chain concept and a firm’s performance. During the study, considerable efforts have been made to understand the relationship between retailers and their suppliers in terms of their integration and business performance.

Following are the challenge areas identified in the management of supply chain:

1. Link supply chain strategy to overall business strategy to align supply chain initiatives to business objectives.
2. Identify supply chain goals and develop plans to assure every process is individually capable of meeting supply chain goals.
3. Develop systems to listen to signals of market demand and plan accordingly, including changes in ordering patterns and changes in demand due to customer promotions.
4. Manage the sources of supply by developing partnerships with suppliers to reduce the costs of materials and receive materials as needed.
5. Develop customized logistics networks tailored to each customer segment.
6. Develop a supply chain information systems strategy that can support decision making at all levels of the supply chain and offers a clear view of the flow of products.
7. Adopt cross-functional and cross-business performance measures that link every aspect of the supply chain and include both service and financial measures.
Companies who are successful will be those that are managing across all nodes of the supply chain from their supplier’s supplier to their customer’s customer. A clear understanding of supply chain concepts and a willingness to openly share information between supply chain partners is a necessary first step to make the supply chain a competitive force for a business. So far, most of the survey-based researches have not addressed all relevant issues and findings are not all clear, yet. This study has enough scope to go to the roots of retail supply chain issues and tap the parameters responsible for making a substantial impact on the performance of an organisation. The research work is expected to bring forward understanding of issues relating to supply chain integration, assess the level of logistical integration among the supplier and retailer and determine whether a linkage exists between implementation of the integrated supply chain concept and a firm’s performance.

To address the gaps in the existing supply chain relationship literature as detailed in Chapter 2, Section 2.3, some important questions considered in this research are as follows:

1. What are the key factors having greatest impact on the retail supply chain performance?
2. What is the extent of role played by Information Technology in the supply chain integration process in improving the overall business performance?
3. What important performance measures should be included to appropriately assess the performance of retail supply chain?
4. Do purchasing strategy and its components play a role in improving the performance measures?
5. What are the underlying dimensions of supplier selection and assessment that managers consider important in making purchase decisions and how do these dimensions impact the business performance?
6. What are the important factors for evaluating retail operations more specifically the shelf management and inventory management?
3.2 Research Objectives

Though some studies have addressed the importance of the relationship on performance, the performance outcomes of long-term cooperative relationships were either too narrowly or too broadly operationalised. Chen and Paulraj (2004b) and O'Toole and Donaldson (2002) also pointed out that focus on a particular aspect of performance that measures either financial or operational performance is what is often found in many buyer-supplier relationship models, and others emphasize the performance of either buyer or supplier firm. Such studies do not provide the exchange parties with a clear picture of the performance of a firm or a supply chain, what actions should be taken to improve business operational processes or how to manage their relationships by the development of cooperative activities. Although the works of Gao et al., (2005) and Johnson and Pharr (1997) have shown that some relationship factors such as trust, dependence and communication can reduce the buyer's decision-making uncertainty, a critical question of 'whether better relationships can lead to improved supply chain performance through mitigating the exchange partner's decision-making uncertainty' is unanswered. This suggests that a more holistic model is required for better understanding about the relationships among buyer and supplier, decision-making uncertainty and supply chain performance.

Based on the above questions and the summary detailed in Chapter 2, the major objectives of this research are presented below:

Objectives:

6. To examine the role of supplier – retailer integration in business performance of the retail organisations. (Reference: Chapter 2, Section 2.2.1 and 2.2.3)

7. To study the extent to which Information Technology provides the feature and fit to the requirement of supply chain integration process between retailer and supplier. (Reference: Chapter 2, Section 2.2.2)

8. To study the purchasing strategy of retail organisations and explore the requisites of effective purchasing strategy. (Reference: Chapter 2, Section 2.2.4)
9. To investigate the supplier selection process and identify the factors and criteria of selection. (Reference: Chapter 2, Section 2.2.5)

10. To examine the inter-relationship between retail shelf management and inventory management. (Reference: Chapter 2, Section 2.2.6).

3.3 Theoretical Framework

A theoretical framework enables to predict the interrelationships between different constructs. In this research work, attempts have been made to predict the interrelationships amongst organisations' business performance, extent of integration between two partners and extent of Information Technology use in providing feature and fit to the integration process and finally to assess its impact on the business performance of the organisation. Based on the literature review, need for the study, research questions and subsequent research objectives, a framework has been established that describes the casual relationships amongst the constructs identified and mentioned above. The rationale underlying this research is that considering the relationships between each pair of constructs a number of hypotheses have been developed and theoretical support for these objectives and hypotheses are discussed in the following section (Refer Section 3.4). Figure 3.3.1 represents the theoretical framework based on which the research work has been done.

![Theoretical Framework Diagram](image-url)
3.4 Development of Hypotheses Statements:

3.4.1 Supply Chain Integration and Business Performance

Research work of Ramdas and Spekman (2000) and others emphasize the need for sound constructs and methodologies to better understand the relationship between supply chain integration and performance. Tan (2001) and Croom et al., (2000) stated that the variety of supply chain management and integration definitions is large. The same can be concluded with respect to the constructs and measurement scales that are used in survey research in supply chain management (Chen and Paulraj, 2004). All in all, the consistency of measures and constructs is still limited according to Ho et al., (2002). One point of concern is that different aspects of integration are measured, without explicitly addressing such choices. E.g. the papers of Johnston et al., (2004) and Frohlich and Westbrook (2001) both address integration, but the first one measures patterns of behaviour, while to second one focuses on operational practices. The number of items used to measure a specific aspect of integration seems to be small in some research. And, thirdly, a last point of concern relates to the level of analysis. Some studies measure integration as an organisational variable and only a few (Johnston et al., 2004; Gimenez and Ventura, 2005) consider single links and relationships. Related to this point is what a measurement of performance actually means from a conceptual or theoretical perspective, e.g. the relationship between the level of integration with one single supplier and the buying firm’s financial performance is hard to understand. Based upon the above considerations, the study seeks to serve two different but related goals. The firstly the study aims to develop a framework for measuring the relationship between integration and performance that incorporates different aspects of integration and explicitly takes into account the influence of business conditions. Second, it aims to empirically investigate the above relationship by conducting a survey among retailers and suppliers.

Based upon the above findings an alternative way of analyzing and categorizing the study is considering the items used to measure integration and labelling these items as operational parameters. Supply Chain (SC) practices are concrete activities or technologies that play an important role in the collaboration of a focal firm with its
suppliers and/or customers. Examples are the use of EDI, integrated production planning, procurement, packaging congruence, Vendor Managed Inventories (VMI), order management and deliveries synchronisation (De Toni and Nassimbeni, 1999; Frohlich and Westbrook, 2001; Kulp et al., 2004). Related to these practices are the SC patterns or interaction patterns between the focal firm and its suppliers and/or customers. Examples are regularly visits to the supplier’s facility, frequent face-to-face communication, high corporate level communication on important issues with key suppliers, and formal, periodic written evaluation of suppliers (Bagchi and Skjoett-Larsen, 2005; Carr and Pearson, 1999; Chen et al., 2004; Duffy and Fearn, 2004; Stanley and Wisner, 2001).

The review of the literature confirms that many surveys measure output performance of the focal firm on an aggregate level. If it is assumed that integration means investing in a buyer-supplier relationship, it would make sense to measure performance in terms of the aims of these efforts with respect to this particular relationship. Possible aims are to reduce reaction times and/or stocks, but also to increase the visibility in the chain or to attain a more effective and efficient way of communication. Measuring on the level of relationship directly as some papers do (Benton and Maloni, 2005; Duffy and Fearn, 2004; Humphreys et al., 2004; Johnston et al., 2004; Giménez and Ventura, 2003, 2005), can also help in dealing with the measurement issue. A large amount of the current papers uses subjective measurements of performance relative to the past or relative to competitors, that are hard to validate. Directly measuring the performance of the relationship could be relatively easy.

One recent study has put more emphasis on supplier integration stating that when supplier integration is at a low level, customer integration can even produce a reduction in efficiency (Pamela Danese and Pietro Romano, 2011).

Although the paper of Fisher (1997) is widely cited, it has taken some time to influence the survey-based research, with a clear exception of Ramdas and Spekman (2000) and Maloni and Benton (2000). Only recently, some more studies (Benton and Maloni, 2005; Fynes et al., 2005) have considered the role of business conditions further. Earlier case
study based work (Van Donk and Van der Vaart, 2004; Van der Vaart and Van Donk, 2006) clearly shows that the assumption that higher levels of integration improve supply chain performance needs revision. One of the main determining factors for the type and level of integrative practices is uncertainty related to demand (volume, mix, specification) that has been considered by others as well (Childerhouse and Towill, 2002).

Based on the above literature and keeping in mind the research gap, following four hypothesis statements are designed to address the objective ‘To examine the role of supplier – retailer integration in business performance of the retail organisations’:

**Hypothesis IRA**

H_{0}: There is no significant difference between perception rating on performance of the organisation resulting from supplier-retailer integration process in terms of agreeing to the factors and degree of satisfaction achieved as a result supplier-retailer integration process impacting business performance. (Retailer Version)

H_{1}: There is a significant difference between perception rating on performance of the organisation resulting from supplier-retailer integration process in terms of agreeing to the factors and degree of satisfaction achieved as a result supplier-retailer integration process impacting business performance. (Retailer Version)

**Hypothesis IRB**

H_{0}: Performance of retailer doesn’t depend on the extent of supply chain integration.

H_{1}: Performance of retailer depends on the extent of supply chain integration.

**Hypothesis 2SA**

H_{0}: There is no significant difference between perception rating on performance of the organisation resulting from supplier-retailer integration process in terms of agreeing to the factors and degree of satisfaction achieved as a result supplier-retailer integration process impacting business performance. (Supplier Version)
H$_1$: There is a significant difference between perception rating on performance of the organisation resulting from supplier-retailer integration process in terms of agreeing to the factors and degree of satisfaction achieved as a result of supplier-retailer integration process impacting business performance. (Supplier Version)

**Hypothesis 2SB**

H$_0$: Performance of supplier doesn’t depend on the extent of supply chain integration.

H$_1$: Performance of supplier depends on the extent of supply chain integration.

3.4.2 Supply Chain Integration and Information Technology

Increasingly, IT is used to facilitate internal coordination within a firm and enhance external integration with external constituencies (e.g., customers and suppliers) and also to enhance decision making among supply chain members. This phenomenon is evident by the increased usage of information systems for integration purposes; for instance, information systems infrastructure (e.g., data communication tools, network connection, standard data structure and unified coding standards), information systems software (e.g., enterprise-wide information system such as SAP), and information systems applications (e.g., centralized database management systems, electronic data interchange (EDI), web-based or internet-based information systems). Although the advances in information technologies are considered a key driver of supply chain integration; what is the best way to deploy these technologies and to coordinate supply chain-wide activities is still under research (Gangopadhyay and Huang, 2004).

The benefits of IT utilisation in enhancing organisational performance (Kim and Narasimhan, 2002; Rushton and Oxley, 1994; William et al., 1997; Bardi et al., 1994; Carter and Narasimhan, 1995; Gross 1984; Kaltwasser, 1990; Karthik N.S. Iyer, 2011), the mechanism by which IT utilisation enhances supply chain are well documented in literature. Although some studies have pointed out that IT utilisation can lead to productivity, performance, and differential and sustainable competitive advantages because it can strengthen linkages between functions within a firm and between firms (Hammer, 1990; Hammer and Champy, 1993; Davenport and Short, 1990; Venkatraman.
empirical studies have not shown consistent results. In fact, several studies have shown that, in some instances, IT investment has had negative, dysfunctional effects on organisational productivity and performance (Hitt and Brynjolfsson, 1994; Roach, 1989; Weill, 1988). In retail environment, IT utilisation in context to data capture finds a strategic role and can be seen as a potential area of research. Selection of technology for data capturing is the decision area by the top management keeping in mind the impact and returns in the business performance of the organisation derived from the implementation and utilisation of the technology.

The literature survey attempts to address the second objective, ‘To study the extent to which Information Technology provides the feature and fit to the requirement of supply chain integration process between retailer and supplier’ and hence the hypothesis statements are:

**Hypothesis 3**

**H**₀: There is no relationship between supply chain integration process between retailer and supplier and extent of Information Technology use in a retail organisation.

**H**₁: There is a relationship between supply chain integration process between retailer and supplier and extent of Information Technology use in a retail organisation.

**Hypothesis 4**

**H**₀: There is no relationship between supply chain integration process between retailer and supplier and extent of Information Technology use in a supplier organisation.

**H**₁: There is a relationship between supply chain integration process between retailer and supplier and extent of Information Technology use in a supplier organisation.

**Hypothesis 5**

**H**₀: Performance of retailer doesn’t depend on the extent of Information Technology use.

**H**₁: Performance of retailer depends on the extent of Information Technology use.
Hypothesis 6

H₀: Performance of supplier doesn’t depend on the extent of Information Technology use.
H₁: Performance of supplier depends on the extent of Information Technology use.

3.4.3 Purchasing Strategy

Increasing dynamics of corporate markets and the effects of global competition have caused significant changes in the business environment and put increasing pressure on companies to improve performance. In order to stay globally competitive, companies are enforced to adapt to changing market environments more quickly and to seek for sustainable competitive advantage continuously. To improve overall corporate performance companies aim to focus on core competencies shifting away from vertical integration toward smaller, leaner operations (Prahalad and Hamel, 1990). Companies strive to outsource non-core items by choosing to procure these goods and services from other firms rather than producing them internally and thus integrating competitive advantage of other companies e.g. cost advantages, know-how advantages, innovation potentials etc. (Trent and Monczka, 2002). Accordingly a shift from generating total value added within the firm to generation of total value added within value chain networks can be observed. Recent surveys have shown that, on average, companies have reduced their degree of value added to less than 50% in many industries (Jahns, 2005). Accordingly an increase of strategic relevance of purchasing due to the large impact of external spend on operating profit can be observed (Ellram and Liu, 2002). A review of the literature implies the need for considerable interaction between purchasing and logistics. In almost any article that explores the purchasing function or examines management of the supply base, one of the primary concerns is the successful and timely delivery of the sourced item (Bozarth et al., 1998; Choi and Hartley, 1996; Dickson, 1996; Fawcett and Fawcett, 1995; Gentry, 1993; Masella and Rangone, 2000; Page and Krause, 2002; Pearson et al., 1998; Petersen et al., 2000; Tan et al., 2002; Verma and Pulman, 1998; Vonderembse and Tracey, 1999; Vyas and Woodside, 1984; Wagner, 1987; Wisner and Tan 2000a). Much of logistics literature suggests or implies that an integrated logistics incorporated the purchasing functions within it, at least on the inbound side.
(Bowersox and Closs, 1996; Bowersox and Daugherty, 1987; Christopher and Towill, 2001; Greis and Kasarda, 1997; Pfahl, 1997; Wisner, 2003). Conversely, other suggests that purchasing should encompass inbound logistics (Elram, 1990; Gentry and Farris, 1992; Pearson et al., 1996; Walters, 1998). Literatures emphasize the need for purchasing and logistics to co-ordinate or integrate their activities (Fawcett and Magnan, 2002; McGinnis and Kohn, 2002), and text book definitions of SCM incorporate this concept (Bowersox and Closs, 1996; Monczka et al., 2002). The importance of internal as well as external supply chain integration to firm’s performance is frequent thing of the literature (Bozarth et al., 1998; Dougherty et al., 1996; Ellinger et al., 2000; Fowcett and Birow, 1992; Petersen et al., 2000; Stevens, 1989). Professional Managers have been aware of the need to integrate purchasing, logistics and other supply chain functions for over a decade (Barry et al., 1992; Buxbaum, 1995; Cole and Baron, 2003; Richardson and Trunick, 1991). Executive titles such as vice president of purchasing and logistics (Anonymous, 2002), director of purchasing and distribution (Murrin, 2004), and purchasing and logistics director (Anonymous, 1997) stress that these integration are becoming more commonplace and it is evident from literatures that for organisations success an effective purchasing strategy is a prerequisite.

Today purchasing ability to impact strategic planning has already increased in a number of firms (Carter and Narasimhan, 1996). Purchasing objective can no longer be seen as entirely clerical, underlying paradigm shift as purchasing moves from an operative to a strategic and from a clerical to a management function. Purchasing evolves to supply management; it becomes responsible for the holistic, integrated planning, controlling and monitoring of the procurement aspects of the internal and external value chain (Jahns, 2005b). As a consequence of these shifting paradigms it can be considered vitally important for companies to implement supply strategy into the organisation. Mintzberg states that strategies are realized through the consistency of decision making and action (Mintzberg, 1978). One means of inducing the consistency of decision making and action is to gain transparency of purchasing and supply management performance through the establishment of performance measurement systems (Neely, 1999). It has been investigated recently that the installation of performance measurement systems facilitates
the coordination and alignment of purchasing and supply management activities with corporate strategy (Cousins and Spekman, 2003; Carter et al., 2005). Thus, supply performance measurement can be considered as a critical element in translating supply strategy into action. The old saying “You cannot manage, what you cannot measure” that can be traced back to Bill Hewlett, the founder of the US computer manufacturer (House and Price, 1991), points out the impact of performance measurement for the management of purchasing and supply. Companies must have in place decisive metrics (key performance indicators), that reflect their supply strategy, tie financial and non-financial goals to them and implement them in the organisation to drive the efficiency and effectiveness of the outsourced value added process steps through the purchasing and supply management function. Since purchasing function links between buyer and seller (retailer and supplier), it becomes pertinent to assess the pre-requisites of this function to initiate any integration process.

Research in performance measurement in purchasing and supply management has been in the focus recently as researchers and practitioners became aware of the strategic importance of the business function itself. Accordingly the following definition will be used, “Supply Performance Measurement means translating the efficiency and effectiveness of purchasing and supply management over all organisational levels (e.g., corporate supply management, category management, buyer, supplier) in financial and non-financial goals and metrics (e.g. cost, time, quality, innovation potential, supplier responsiveness) by integrating indicators of past and future performance.”

Hence, this discussion leads to address the objective three, ‘To study the purchasing strategy of retail organisations and explore the requisites of effective purchasing strategy’.

3.4.4 Supplier Selection

Referring to Chapter 2, Section 2.2.5, another important area in the initiation of any relationship based operation, in context to this research the supplier-retailer integration and given the increasing importance of outsourcing, one would expect that how suppliers
are selected and assessed, and in particular, how the criteria used to guide these decisions will impact the retail organisation’s performance. A greater onus exists on firms to ensure that wouldbe suppliers can create value for the buying organisation, and that once selected, supplier performance is consistent with the buying firm’s expectations. However, little is known about the relationships between supplier selection and assessment and a buying firm’s performance. Vonderembse and Tracey (1999) observed that supplier selection tactics positively impact a buying firm’s manufacturing performance. They also demonstrated that high performing companies attach greater importance to key supplier selection criteria such as quality and delivery performance than low performing companies. They did not however attempt to relate supplier selection to broader measures of business performance. The supplier assessment literature makes no reference to studies linking assessment criteria and the performance of the buying firm. Related to the question of how supplier selection and assessment impact a buying firm’s performance is the question of whether common trends exist for firms in different parts of the world. Much of the extant literature on supplier base management is based on the experience of US firms. While a handful of studies have examined supplier base management elsewhere in the world, few have attempted to contrast practices in multi-national settings. However very little literatures or researches have examined relationships between supplier selection and assessment and its impact on the buying firm’s performance. No attempts were made to identify and compare underlying dimensions of supplier selection/assessment, its relation and impact on the performance of the organisations.

Reviewing the pertinent literature reveals that a number of questions remained unanswered. Specifically:

1. What are the underlying dimensions of supplier selection and assessment that managers consider to be important in influencing supplier selection?

2. What is the degree of satisfaction achieved as a result of supplier selection process based on the selection Criteria?
Hence, the above questions and the discussions lead to the stated objective: 'To investigate the supplier selection process and identify the factors and criteria of selection' and hypothesis statement:

**Hypothesis 7**

$H_0$: There is no significant difference between the respondents' perception towards agreeing and degree of satisfaction achieved in selecting key or preferred supplier.

$H_1$: There is a significant difference between the respondents' perception towards agreeing and degree of satisfaction achieved in selecting key or preferred supplier.

### 3.4.5 Retail Shelf Management and Inventory Management

Shelf replenishment is the final stage in the retail supply chain, but has received only limited attention in the supply chain management literature. In fact, it is noted that there is little consistency in the definitions of supply chain management (Bechtel and Jayaram, 1997) and such inconsistency can influence the extent to which the processes within the retail stores are viewed as part of the whole supply chain. Using definitions by Cooper et al., (1997), supply chain management is 'the integration of business processes' in such a way that it adds 'value for customers.' A similar view by Christopher (1992) suggests that it involves 'process and activities that produce value in the form of products and services in the hands of the ultimate consumer'. Thus, from these interpretations, the integration of processes and activities within a retail store must form part of the supply chain. In this research work, the scope is limited to processes within the retail store – with particular regard to the impact of product information on these processes. Since only limited research has been conducted in this area, particularly with respect to the use of Information Technology such as electronic point of sale (EPOS) to improve in-store processes (Stone and Hollier, 2000), the rationale for focusing only on the confines of the retail store is motivated by both business and academic issues. In the real world, the final few stages of the supply chain may be most critical, as no matter how efficient the back-end of the supply chain is. Inefficient shelf replenishment will lower the total supply chain performance. A finding by ECR Europe (Roland Berger Strategy Consultants, 2003) suggests that the availability of products (so-called service level) deteriorates along
the supply chain from the manufacturer to the retailer and the service level within the retail store is significantly lower than the stages before. A different survey by Accenture (2003) found that almost a third of off-sales items can be found in the backroom of the retail store. If a product is out of stock, 37% of consumers are likely to switch brands and 9% are likely to skip the purchase altogether (Roland Berger Strategy Consultants, 2003). The focus of this research on replenishment from backroom to the shelf is therefore important in order to understand the causes of low levels of stock on shelves. We therefore define shelf replenishment here as ‘the process of restocking shelves by moving products from the backroom of the retail store’. Similarly, store replenishment is defined as ‘the process of restocking inventory in the retail store from the warehouse, distribution centre, manufacturer or supplier’. Following these definitions, we can examine the occurrence of out-of-stock products as temporary unavailability of products in the retail store, while off-sales products are products temporarily unavailable on the retailer’s shelves. It is worth noting previous work related to shelf replenishment. In academic inventory control literature, retail supply chains are generally examined at the echelon level, with the retail store viewed as a single entity (e.g. Clark and Scarf, 1960; Chen, 1998; Beamon and Chen, 2001). It assumes that once the retail stores are replenished from the distribution centres, all the products will be automatically displayed on the retail shelves (Urban, 2002). In other words, the internal operations of the retail store are viewed essentially as a black box and the occurrence of off-sales products (not on the shelf) is treated as being the same as out-of-stock products (not in the store at all). Although not specially targeted at shelf management, there have been various previous studies on the impact of inventory accuracy (Wayman, 1995; Raman et al., 2001; Brown et al., 2001) and time delays (Forrester, 1969; Lee, 1997; Chen, 1999) on effective supply chain performance, and these approaches are also useful in examining the shelf replenishment process within the retail store. The above literature and in reference to Chapter 2, Section 2.2.6, Hypotheses 8 and 9 are designed to address the objective, ‘To examine the inter-relationship between retail shelf management and inventory management’.
Hypothesis 8

H₀: There is no significant difference between the respondents’ perception towards rating a factor and degree of satisfaction achieved as a result of retail stores operations.

H₁: There is a significant difference between the respondents’ perception towards rating a factor and degree of satisfaction achieved as a result of retail stores operations.

Hypothesis 9

H₀: There is no relationship between inventory management and retail shelf replenishment.

H₁: There is a relationship between inventory management and retail shelf replenishment.

3.5 Research Design and Sampling

In the previous chapter, based on a literature review, best universal practices of performance measurement of supply chain were discussed. A review of various issues of competitiveness and performance measures that are currently in focus for improving the efficiency and effectiveness of a supply chain was presented. An effort was made to align those performance measures with retailers and suppliers. However, these issues can be measured and what metrics would be suitable for them were also discussed. The constructs were discussed in the previous chapter are classified into various operational parameters from the wider contemporary literature on performance measurement (Bourne et al., 2000, 2002; Kennerley and Neely, 2002, 2003; Neely et al., 2000; Waggoner et al., 1999). The research has attempted to address these issues by providing taxonomy of measures, a critical review of metrics and measurement systems used to evaluate retail supply chain performance, and possible avenues for future research.
A. Process of Questionnaire Development

To develop the questionnaire, the procedures suggested by Churchill (1979) and Gerbing and Anderson (1988) were followed. Following stages illustrates how the questionnaire items were developed before conducting the final survey. Each process is detailed below:

1. Literature Review
2. Interactions with Practitioners and Academicians
3. Pre-test (Qualitative and Pilot Survey – Faculty, Industry Experts and Consultants)
4. Pre-test (Pilot Survey - 50 Retailers’ Responses and 50 Suppliers’ Responses)

Stage 1: Literature Search

The first stage involved an extensive literature review. Most of the scale items adopted for this research were from previous studies. However, since most of the literature is based on a Western context, it is very important to choose appropriate measures and to make necessary modifications to some items in order to fit the research context. There were two separate versions, one for surveying retailers and one for suppliers. In developing the items, parallel wording was used for both the retailer and supplier versions. Thus, the versions of the questionnaires for the retailer and supplier were identical except for a few additional sections for retailers to achieve appropriate understanding of retail operations and the factors identified to impact business performance.

Stage 2: Interactions with Practitioners and Academicians

To evaluate the content validity and wording of the draft questionnaires, in-depth interviews with six suppliers and six retailers were undertaken during the second stage of a pilot study. Content validity is concerned with the adequacy with which the domain of the characteristic is captured by the measure (Churchill, 1999). Six sales managers of supplying firms, including three suppliers of leading international brands and another three suppliers of local brands were interviewed. The interviews also helped the researcher to gain a better understanding about the supply chain relationships from the perspective of the study. Furthermore, to gather broader opinions from the retailer’s
perspective, four retail store managers and four merchandisers were interviewed. These interviewees all have been in the business for more than ten years and have acquired extensive experience and knowledge about the industry.

Stage 3: Pre-test

Items pertaining to a questionnaire should be pre-tested, including layout, length, response format, sequence, word meaning, question difficulty, and skip instructions (Hunt et al., 1982). As to the size of the pre-test sample, there is no conclusive answer but it should be a function of the instrument and the target population (Hunt et al., 1982). The revised questionnaire was pretested with a limited number of retailers and suppliers to identify additional problems with the scales. Questionnaires were delivered to a small group of 50 retailers and 50 suppliers personally. After completing the questionnaires, each respondent was asked to comment whether the instructions were precise and whether any ambiguity or difficulty occurred in answering any of the questions. According to the respondents, only a few questions needed better phrasing. The final versions were generated after minor modifications to the suggested questions. The questionnaire was also administered in a six member group of retail consultants and academicians to crosscheck the wordings, phrasing and adequacy of the instrument. Minor corrections were done to update the questionnaire.

In developing the questionnaire items, parallel wording was applied for both the retailer and supplier and self-reported and perceived measures for all constructs. It should be noted first that both the self-reported (the retailer’s or supplier’s viewpoint) and perceived measures (retailer’s perception of supplier’s viewpoint, or supplier’s perception of retailer’s viewpoint) all reflect the perception of a retailer or a supplier. Extensive review of literature and interviews with industry experts were conducted to gain broader knowledge about the business practices and evaluate the content validity and wording of individual scale items.

B. Empirical Design

Given the research objective of investigating retailer-supplier relationships and supply chain performance of retail business, a quantitative survey method was adopted to collect
data from a large, representative sample of respondents. One important success factor in an empirical study is the quality of respondents. The respondents are expected to have detailed knowledge on multiple topics covered in a survey. In the current study, the respondents are expected to have experience in different levels of retail operation, which is used to enhance integration within their firm or with their trading partners. The respondents are also expected to be representatives of different geographical areas, industries, and firm sizes, so that the results can be highly generalized. Quantitative Research allows researchers to provide statistical facts and estimates about relationships between constructs of research interest and to generalize inferences about the defined target population (Hair et al., 2000). This section describes the empirical design, including the research context, survey method and techniques to increase response rate.

C. Research Context

This research focuses on relationship between organised retailers (hypermarket and departmental stores) and their major suppliers and investigates the effects of various relationship dimensions on the retail supply chain performance. The empirical context for this study is the ‘Organised Retail Industry in India’. As discussed in Chapter 2, supply chain management (SCM) has become the predominant management focus and the source of competitive advantage for many firms. It has been claimed that performance measurement is vital to achieving the advantages of SCM (Chen and Paulraj, 2004b). The performance measurement systems should be linked to the practice of supply chain management so that managers are able to evaluate how well the supply chain is performing (Brewer and Speh, 2000) and to manage their supply chains effectively (Lambert et al., 1998). A number of studies have suggested that performance measurement systems can enhance the buyer-supplier relationship (Heide and Stump, 1995; Harland, 1996; O'Toole and Donaldson, 2002). Thus, a focus on supply chain performance will help foster buyer-supplier relationships. Selecting the appropriate performance measures is critical for the analysis of supply chain performance in order to achieve the supply chain goals (Beamon, 1999; Gunasekaran et al., 2001; Lambert and Pohlen, 2001). Gunasekaran et al., (2001) developed a framework for measuring performance at the strategic, tactical and operational level, and the metrics are
distinguished into financial and non-financial measures. Beamon (1999) maintained that a supply chain measurement system should include three types of performance measures: resource measures (generally cost), output measures (generally customer service), and flexibility (generally responsiveness). Due to the complexity of the supply chains, the metrics design and the focus of performance measures may vary from one firm to another in practice. There have been relatively few attempts to systematically collate measures for evaluating the performance of retail supply chains. For example, they have been grouped according to:

- Whether they are qualitative or quantitative? (Beamon, 1999; Chan, 2003).
- What they measure: cost and non-cost (Gunasekaran, 2001; De Toni and Tonchia, 2001); quality, cost, delivery and flexibility (Scho'nsleben, 2004); cost, quality, resource utilisation, flexibility, visibility, trust and innovativeness (Chan, 2003); resources, outputs and flexibility (Beamon, 1999); supply chain collaboration efficiency; coordination efficiency and configuration (Hieber, 2002); and, input, output and composite measures (Chan and Qi, 2003).
- Their strategic, operational or tactical focus (Gunasekaran et al., 2001).
- The process in the supply chain they relate to (e.g. Chan and Qi, 2003; Huang et al., 2004; Li et al., 2005b; Lockamy and McCormack, 2004; Stephens, 2001).

Because the retail industry in India possesses characteristics manifesting the important relational constructs proposed in the literature review (Chapter 1 and Chapter 2) for evaluating retail supply chain performance, it was chosen as the empirical context for this research.

D. Survey Method

The three most common methods of data collection are mail surveys, face-to-face interviews and telephone surveys, and each has inherent advantages and disadvantages. Several factors were taken into account when choosing the survey method for this research. Mail survey is a less expensive method than telephone interview and personal interview, but a low response rate is the most obvious disadvantage with this type of survey (Hair et al., 2000). Telephone interviews incur less travelling time and are less
expensive than face-to-face interviews. However, to answer a long questionnaire, telephone interviews seem to be not effective (Hair et al., 2000).

Though personal interview is the most expensive and time-consuming data-collection method, it allows the researcher to clarify ambiguous questions for respondents immediately and obtain high response rates (Churchill, 1999). Additionally, personal interview can provide a great amount of feedback and has the lowest level of non-response bias among the three methods of data collection (Yu and Cooper, 1983; Churchill, 1999; Hair et al., 2000). Assael and Keon (1982) indicated that a questionnaire delivered in person has the smallest response bias compared with telephone, mail, or drop-off. They also mentioned that small business firms usually provide more accurate responses in the presence of the interviewer. However, considering the benefits of personal interviews such as better quality of the data and amount of information needed, and the respondent's willingness to participate, face-to-face interviews using a structured questionnaire were adopted as the survey research method. In this research, face-to-face interviews using a structured questionnaire (Appendix A and Appendix B) were conducted to gather retailers' perceptions of relationships with their major supplier as well as suppliers' perceptions of relationships with their major retailer.

Most of the previous studies in channel relationships have been conducted either from the buyers' perspective (Skinner et al., 1992; Morgan and Hunt, 1994; Johnson and Pharr, 1997; Gao et al., 2005) or suppliers' perspective (Eriksson and Sharma, 2003). Perceptions from both sides of the channel can provide a more insightful view into the relationships between retailers and suppliers than that provided by perceptions from one side alone. As suggested by Young and Wilkinson (1997), not to identify the names of major supplier and major retailer allowed both retailers and suppliers much more open opportunity to report their perceptions about their buyer-supplier relationships.

The first three sections of the questionnaires (both retailer and supplier version) focused on the relationship between the retailer and its major supplier. The major supplier is defined here as the firm which supplied the retailer measured in terms of sales turnover of
the supplied product. And the retailers’ version of questionnaire has another three sections to gather information and perceptions of retailers on the identified constructs (reference Chapter 2, Section 2.2.4, 2.2.5 and 2.2.6).

E. Techniques to Increase Response Rate

Since many of the managers are not keen to participate in personal interviews with strangers or respond to mail surveys as information regarding the firm’s business operations is treated in confidence (Ambler et al., 1999; Chen, 1999; Carr and Leong, 2000), many techniques have been used in different types of surveys to improve the response rate. According to Yu and Cooper (1983), response facilitators such as preliminary notification, foot-in-the-door techniques, a cover letter, and personalisation help increase response rates.

In the light of the survey difficulty in India, several techniques were used in personal interviews:

1. A cover letter with explaining the objectives of the research and giving assurance of confidentiality of the responses. In addition, respondents were offered an incentive that in the form of a report the summarized findings of the study would be sent to the respondents.

2. The business card of self was used as part of self-introduction.

3. Before approaching the respondents, a referral or recommendation from some reputable suppliers and retailers from the industry was obtained.

4. To increase the email response ‘Linked-In’ professional network was used and the questionnaire was mailed to the select retailers and suppliers.

F. Sampling Design

The design of the sampling is critical as it serves as the blueprint to ensure that the raw data collected are representative of the defined target population. In this section, the determination of sampling frame, sampling method, sample sizes, and selection of key informants will be discussed.
List of 10 key retailers (Source: IBEF Retail, November, 2010) was used as the source for identifying the target companies. The retail industry comprises manufacturers, suppliers, and retailers. The study focuses only on the hypermarket and department stores format. This study specifically focused on the categories of Food and Beverages, Clothing, Textiles and Fashion accessories, Footwear, Home Furniture and House Hold goods, Electronics, Home Appliances and Consumer Durables, Jewellery, Cosmetics and accessories, Sports Equipments, Books and Stationeries and Baby products and Toys due to their product characteristics and that they comprised the largest proportion of sales contribution to most of the retailers. The survey was conducted in the Delhi and NCR region. However, since many retail corporate offices are situated in Mumbai, Kolkata, Bangalore and Chennai, mailers were used to gather data from these offices.

The survey was conducted in two phases; the first phase was for the retailers and a simple random and convenience sampling technique was used for gathering data. According to Campbell (1955), the criteria for choosing key informants are that the informants should be knowledgeable about the issues covered in the survey and be able and willing to communicate with the researcher. For hypermarkets and department stores, the store/department manager and executives are the persons responsible for purchasing and selling as they have sound knowledge about the overall performance. A total of 207 responses were collected from Retail professionals from different job functions like Purchasing, Techno-commercial, Retail Stores Operation, Materials Management, Warehousing, Sales and Distribution, Marketing and Finance. In the Retailer Version of questionnaire, the respondents were asked to write the top 10 key suppliers by sales turnover of the supplied products. This information was used to gather the supplier database based on products supplied. In retail business, senior executives and managers serve as liaison as they usually interact directly with retailer owners or managers through face-to-face or phone communication (Ganesan, 1994). As suggested by Philips (1981), the qualifications of the key informants of the supplier firms were taken into consideration. For inclusion in the sample, the senior sales representative or sales manager should have worked in the supplier companies for at least one years, have had a business relationship with his major retailer for at least one year, and participated in
company decisions related to issues described in the survey. Failure to meet those criteria meant a person was excluded from the interviews when screening the respondent's eligibility at the initial contact. And, hence, in the second phase, after screening the responses of the retailers, a total of 200 responses were gathered from the key suppliers to retailers from different job functions like Purchasing, Techno-commercial, Retail Stores Operation, Materials Management, Warehousing, Sales and Distribution, Marketing and Finance.

3.6 Data Collection and Analysis
Primary data was gathered through a structured questionnaire that was initially developed based on the constructs identified through literature review and interviews with academicians, practitioners and experts. There were two stages of survey. In the first stage 50 retailers and 50 suppliers were approached to conduct the pilot test. The data collection took place in two phases. In first phase, the questionnaire was administered among the retailers. The retailers were asked to mention their key suppliers (ranked by sales turnover of the supplied product). Based on the retailer's response the key suppliers were identified and the responses of suppliers were completed in the second phase of the survey. The responses were gathered on a five-point likert scale.

The analysis was done using AMOS 19.0 and SPSS 18.0 version. The objective of analysis was to identify the validated construct from each section of Retailer and Supplier Version of questionnaire and then do a path analysis for first order and second order constructs. The results of path analysis were used to see the relationships between the main constructs identified through confirmatory factor analysis. The model fits were checked against the cause or affect that interplays between construct and data in order to validate the investigation, usually by the application of a test or other process. As per the guidelines of Bagozzi (1980) and Bagozzi and Phillips (1982), the important properties for measurement to be reliable and valid include content validity, internal consistency of operationalisation (unidimensionality and reliability) and construct validity (discriminant and convergent). Model-data fit was evaluated based on multiple fit indices. The overall model fit indices include goodness of fit index (GFI), adjusted goodness of fit index
(AGFI), and root mean square error of approximation (RMSEA). GFI indicates the relative amount of variance and covariance jointly explained by the model. The AGFI differs from GFI in that it adjusts for the number of degree of freedom in the model. Many researchers interpret this index scores (GFI, AGFI) in the range of 0.80-0.89 as representing reasonable fit; scores of 0.90 or higher are considered as evidence of good fit (Joreskog and Sorbom, 1989). The RMSEA takes into account the error of approximation and is expressed per degree of freedom, thus making the index sensitive to the number of estimated parameters in the model; values less than 0.05 indicate good fit, values as high as 0.08 represent reasonable errors of approximation in the population (Browne and Cudeck, 1993), values ranging from 0.08 to 0.10 indicate mediocre fit, and those greater than 0.10 indicate poor fit (MacCallum et al., 1996). The initial model fit indices were studied and observed for improvement based on the above explained indices results. Wherever required, further model modification was proceeded based on modification indices (MI) and Standardized Residual Covariance (MSC).

The complete research work was done in three phases; a detailed representation is provided in Figure 3.6.1.

**Phase I** : Need of the study and literature review.

**Phase II** : Research questions, objectives of the study, hypothesis design, questionnaire design and administration, and pilot survey.

**Phase III** : Data collection, instrument assessment, assessment of results, structural equation modelling, hypothesis testing and results and summary of findings.
Figure 3.6.1 Flow Chart of the Research Work
3.7 Summary

This chapter discusses in detail the theoretical framework, hypotheses design and the data collection procedure. It also clearly discusses the analysis procedure planned to be carried out. The flow chart (Figure 3.6.1) depicted at the end of the chapter takes through the next chapter on data analysis and interpretation in a planned and phased manner.