CHAPTER : I

INTRODUCTION AND DESIGN OF THE STUDY

1.1 Introduction

From the beginning of the 1990s, there has been change in the business scenario, mainly due to the liberalization policy of various economies all over the world and revolutionary innovations in the field of science and technology. Particularly, information technology and communication has produced a continuous acceleration in the magnitude of competition. To sustain themselves in such an erratic environment, firms need to have core competency and productivity. That is why firms are perceived to have more systematized activities related to movement and storage of goods, to make them available at a short notice with the lower inventory level. The industries are aware of the importance of Supply Chain Management (SCM) practices to meet out the expectations of the customers.

There is competition in today’s global markets. The introduction of products with shorter life cycles and the heightened expectations of customers have forced business enterprises to invest and focus attention on, their supply chains. This, together with continuing advances in communications and transportation technologies has motivated the continuous evolution of the supply chain and of the techniques to manage it effectively. In a typical supply chain, raw materials are procured and items are produced in more factories, shipped to warehouses for intermediate storage and then shipped to retailers or customers. Effective supply chain strategies must take into account the interactions at the various levels in the supply chain.

SCM is a set of approaches utilized efficiently to integrate suppliers, manufacturers, warehouses, and stores, so that merchandise is produced and distributed in the right quantities, to the right locations and at the right time, in order to minimize system wide costs while satisfying service level requirements.
SCM takes into consideration every facility that has an impact on the cost and plays a role in making the product conform to customer requirements from supplier and manufacturing facilities through warehouses and distribution centers to retailers and stores. Indeed, in some supply chain analysis, it is necessary to account for the suppliers and the customers because they have an impact on supply chain performance.

SCM is to be efficient and cost-effective across the entire system such as total system wide costs. From transportation and distribution to inventories of raw materials, work in process, and finished goods, are to be minimized. Thus, the emphasis is not on simply minimizing transportation cost or reducing inventories but, rather, on taking a systems approach to SCM. Finally it revolves around the efficient integration of suppliers, manufacturers, warehouses, and stores, it encompasses the firm’s activities at many levels, from the strategic level through the tactical to the operational level.

Various companies, consultants and academics have developed a variety of terms and concepts to stress what they believe are the salient issues in SCM. Supply chain strategies cannot be determined in isolation, they are directly affected by another chain that most organizations have, the development chain that includes the set of activities associated with new product introduction. At the same time, supply chain strategies also should be aligned with the specific goals of the organization, such as maximizing market share or increasing profit.

It is challenging to design and operate a supply chain so that total system wide costs are minimized, and system wide service levels are maintained. Indeed, it is frequently difficult to operate a single facility, so that costs are minimized and service level is maintained. The difficulty increases exponentially when an entire system is being considered.

Uncertainty and risk are inherent in every supply chain. Customer demand can never forecast exactly, travel times will never be certain, and machines and vehicles will break down. Similarly, recent industry trends, including outsourcing, off shoring,
increase the level of risk in the supply chain. Thus, supply chains need to be designed and managed to eliminate as much uncertainty and risk as possible as well as deal effectively with the uncertainty and risk that remain. Eliminating entire trouble from the existing SCM the company should study their effectiveness of SCM practices. They have to identify the important elements of SCM, modern technologies which are sufficient to increase the effective operations of SCM, benefits of SCM and impact of SCM.

SCM is the term used to describe the management of the flow of materials, information and funds across the entire supply chain, from suppliers to component producers to final assemblers to distribution and ultimately to the consumer.

SCM has generated much interest in recent years for a number of reasons. Many managers realize that, actions taken by one member of the chain can influence the profitability of all others in the chain.

1.2 STATEMENT OF THE PROBLEM

Health care industry is one of the worlds largest and fastest growing industries. It comprises various sectors such as medical equipment, pharmaceutical, healthcare services and so on. The health care supply chain involves the flow of many different product types and the participation of various stakeholders. The main purpose of the health care supply chain is to deliver products at the right time in order to fulfill the needs of customers.

The concept of SCM was introduced in the year 1980. It expresses the need to integrate the key business processes, from end user through original suppliers. SCM focuses on planning, forecasting, purchasing, storing, moving, product assembly and keeping track of a product. SCM is an essential element of operational efficiency. It plays a role in cultural evolution and helps to improve the quality of life. It creates jobs, decreases pollution and increases the standard of living. In health care industry, SCM practices increase the efficiency in all the functional activities of
production and operations management, which use to produce quality product at right time

SCM tries to maintain good relationship with vendors and suppliers. Seamless flow of material and information is the key to supply chain. This helps in reducing the inventory, leads to low cost and increases the flexibility, improving price value offerings and so on.

Many companies are manufacturing the health care products in India. Due to the strong competition in the global market, every company is concentrating with its logistics and SCM activities. Therefore the company finds the ways to equip their distribution performance in SCM with the help of research models, case analysis and so on.

HLL Life care Ltd is an Indian public sector company, manufacturing healthcare products to meet out the needs of the customers. It supplies its products in national and international fields with the key attributes such as right quality, right quantity, right price and the right time. The company has long term forecast with their products and services to the nation. Therefore HLL Life care wants to study the SCM practices of health care products to increase its efficiency in manufacturing process, technology, software, quality of the product, distribution channels and so on.

This study aims to analyze the major factors to maintain smooth relationship with vendors and suppliers. Many studies were conducted in foreign countries related to logistics and SCM practices in health care. In India, Gurgaon management development program cell, studied the Indian SCM architecture.

In India SCM related studies are very limited, especially the public sector health care products of SCM practices is very rare. Therefore it is necessary to study the SCM practices in Indian public sector health care company to assess the efficiency, productivity, profitability, benefits, problems and impact of SCM. This study has been conducted to examine the SCM practices in health care products of the HLL Life care Limited, Trivandrum. This study throws light on benefits, problems
and impact of SCM activities. The study is useful to HLL Life care to identify the association among benefits, problems and impact of SCM.

As it is rightly said that “Imagination is more important than knowledge”. That is, “there are many paths to go to the top of the mountain, but the view is always the same” which indicates that SCM success the HLL Life care need to practice with more imagination, hard work and proper planning.

\section*{1.3 NEED FOR THE STUDY}

The HLL Life care Ltd manufactures health care products such as male, female condoms, blood bags, tablets and so on. Their target customers are the public, hospitals and educational institutions in India and abroad. Initially, the products were distributed through the clearing and forwarding agencies. Customers did not receive their products in times due to poor transport, improper communication, poor co-ordination and so on. Hence, the SCM operations become essential for this industry. The SCM operations cannot be performed by a single person. It is a team work, if one department leads to delay in their task, the entire chain gets affected. The HLL Life care should effectively operate the SCM activities in order to strengthen the overall activities. SCM activities manage to increase the product maximization and profit maximization through the effective planning, scheduling, co-ordination and controlling the operations of SCM activities. Hence, an attempt has been made to study the SCM practices in health products of HLL Life care Ltd.

\section*{1.4 SCOPE OF THE STUDY}

This study covers the demographic profile of the executives, benefits, problems, impacts, factors influencing the SCM practices and Information technology for the effectiveness of SCM. The theoretical background about the SCM practices and the profile of the HLL Life care Ltd are highlighted.
1.5 OBJECTIVES OF THE STUDY

1) To study the demographic profile of the executives of HLL Life care Ltd.

2) To analyze the important elements of SCM and useful software packages for the effective operations of SCM.

3) To measure the benefits, problems and impacts of SCM in the study domain.

4) To examine the inter-relationship among the benefits of SCM, problems of SCM, impacts of SCM, operations management and logistics department.

4) To identify the impacts of supply chain on the distribution system.

5) To measure the influence of demographic and organizational variables on benefits, problems and impacts of SCM and overall performance metrics.

6) To assess the influence of benefits, problems and impacts of SCM on the SCM effectiveness.

7) To construct an empirical model of SCM for the health care products.

8) To offer suggestions based on findings of the study.

1.6 HYPOTHESES USED FOR THE STUDY

The following are the hypotheses of the study

1) The demographical profiles do not influence the benefits, problems and impact of SCM

2) The transport facilities do not influence operational, financial and social performance of the company.
3) The operational, tactical and current programming strategies do not influence cost management, customer services, quality, productivity and asset management.

4) The delivery performances do not influence the elements of cost management, customer services, quality, productivity and asset management.

5) The aggregate planning of SCM does not influence the metrics of operational, financial and social performance.

6) There is no association between the clusters of benefits and problems and impacts of SCM.

7) The benefit clusters do not influence the logistics department, strategic plan of logistics, procedure of non-conformities regarding SCM.

8) There is no association between the problem cluster and logistics department, strategic plan of logistics, procedure for non-conformities of SCM.

9) The logistics strategic plan and procedure of non-conformities do not influence impact of SCM.

1.7 METHODOLOGY

This study is based on both the primary and secondary data. The primary data have been collected from the executives of HLL Life care Ltd. It is an empirical study, based on survey method. Structured questionnaire is used for finding out respondents perception towards SCM practices on health care products of HLL Life care. The researcher met the respondents in person to collect primary data. The
The questionnaire has four sections such as personal information, elements of SCM, benefits, problems and impacts of SCM and performance of SCM. The primary data collection was done from 2010 to August 2011. The secondary data have been collected from various journals, books, magazines and reports, internet and records of HLL Life care

1.8 SAMPLE SIZE

The population is finite. Therefore the researcher has collected data from 93 executives of HLL Life care Limited with the SCM operational experience. The simple random sampling method has been used. It becomes probabilistic sampling and paves the way to use both univariate and multivariate statistical technique in both parametric and non-parametric approach.

1.9 SAMPLE DESIGN

The sample of 93 executives were selected by using simple random sampling technique. The selected sample represents various designations such as top level executive, middle level executives and operational level executives working in many departments of HLL Life care Limited. The detailed statistics on the universe and the sample size are given in Table 1.1

Table: 1.1

<table>
<thead>
<tr>
<th>Designation</th>
<th>Population</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top level</td>
<td>24</td>
<td>20</td>
</tr>
<tr>
<td>Middle level</td>
<td>44</td>
<td>39</td>
</tr>
<tr>
<td>Operational level</td>
<td>42</td>
<td>34</td>
</tr>
<tr>
<td>Total</td>
<td>110</td>
<td>93</td>
</tr>
</tbody>
</table>
According to the Rao soft sample size calculator at 5 percent significance level of the population 110, the proposed sample size is 86. But the researcher has collected data from 93 executives of the HLL Life care Ltd.

1.10 VALIDITY AND RELIABILITY TESTS

The pre-test was conducted before finalizing the questionnaire. It was issued to 20 executives in HLL Life care Ltd. It was administrated and discussed. Both formal and informal discussion were held for fine tuning the question pattern and content. Their views and suggestions were helpful in restructuring the questionnaire. The Corn Bach’s Alpha test was administrated to the sample respondents to find out the reliability of the questionnaire. The questionnaire was finalized after the pre-test. The reliability of interview schedule is given in Table 1.2

<table>
<thead>
<tr>
<th>S.No</th>
<th>Variables</th>
<th>No. of respondents</th>
<th>No. of items</th>
<th>Cronbach's Alpha value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Elements of SCM</td>
<td>20</td>
<td>13</td>
<td>.898</td>
</tr>
<tr>
<td>2</td>
<td>Benefits of SCM</td>
<td>20</td>
<td>13</td>
<td>.891</td>
</tr>
<tr>
<td>3</td>
<td>Problems of SCM</td>
<td>20</td>
<td>17</td>
<td>.883</td>
</tr>
<tr>
<td>4</td>
<td>Impacts of SCM</td>
<td>20</td>
<td>19</td>
<td>.904</td>
</tr>
<tr>
<td>5</td>
<td>Future measures for supporting</td>
<td>20</td>
<td>8</td>
<td>.900</td>
</tr>
</tbody>
</table>

Table : 1.2

Reliability of Interview schedule
<table>
<thead>
<tr>
<th></th>
<th>SCM</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Suppliers and vendor management</td>
<td>20</td>
<td>13</td>
<td>.889</td>
</tr>
<tr>
<td>7</td>
<td>Cost management factors</td>
<td>20</td>
<td>15</td>
<td>.912</td>
</tr>
<tr>
<td>8</td>
<td>Customer service factors</td>
<td>20</td>
<td>12</td>
<td>.821</td>
</tr>
<tr>
<td>9</td>
<td>Quality factors</td>
<td>20</td>
<td>8</td>
<td>.894</td>
</tr>
<tr>
<td>10</td>
<td>Productivity factors</td>
<td>20</td>
<td>10</td>
<td>.821</td>
</tr>
<tr>
<td>11</td>
<td>Asset management factors</td>
<td>20</td>
<td>7</td>
<td>.876</td>
</tr>
</tbody>
</table>

Source: Primary data

The Cronbach's Alpha value indicates that the variance with the perception of the respondents is significant at the 5 percent level. This implies the Cronbach’s alpha value is greater than the benchmark value of 0.75. Therefore, it can be concluded that all the block of variables in likert’s five point scale is highly significant and fit to conduct the research.

1.11 DATA PROCESSING

After completion of data collection, a thorough check was made. The whole questionnaire was processed for coding the data in a computer. Then SPSS 15.0 version was used to analyze the data.

1.12 FRAMEWORK OF ANALYSIS

The present study is analysed in three sections such as demographic profile and information technology for SCM operations, benefits, problems and impacts of SCM in HLL Life care Ltd, and factors influencing the SCM practices. The socio economic factors deal with analyzing the profile of the sample using simple frequency analysis. For analyzing the influence of socio economic factors on benefits, problems and impact of SCM, the parametric and non-parametric tests have been used. The t test has been used to know the executives perception towards the elements of SCM, benefits, problems and impact of SCM. The Kaiser Meyer Olkin and Bartlett’s test is used to check the normality of the distribution. Based on the KMO value, the factor analysis is used to factorize the benefits, problems and impact factors of SCM in HLL Life
care. Correlation analysis is used to find out the association between the benefits, problems and impact of SCM.

Cluster analysis has been used to frame the clusters for the benefits, problems and impact factors of SCM. The multiple regression analysis model is used to check the influence of independent and dependent variable. The benefits and problem factors are treated as independent variables and impact variables are considered as dependent variables. The chi-square test is used to analyze the influence of transport facility, logistics strategic plan, aggregate planning, overall performance metrics on benefits, problems and impact factors of SCM.

1.13 OPERATIONAL DEFINITIONS OF THE CONCEPTS

1) **Supply Chain Management (SCM)**

SCM is the process of planning, implementing and controlling the operations of the supply chain with the purpose of satisfying the customers’ requirement at the right time.

2) **Supplier relationship management (SRM)**

SRM is the discipline of strategic planning and managing all interactions with third party organizations that supply goods and services to an organization.

3) **Customer relationship management (CRM)**

CRM is a widely implemented model for managing a company’s interactions with customers, clients, and sales prospects.

4) **Logistics Management**

Logistics management is a part of SCM which includes planning, implementing, and controlling the efficient, effective forward and reverse flow and storage of goods, services and related information between the point of origin and the point of consumption in order to meet customers' requirements.
5) **Just in time (JIT)**

JIT is a production strategy that strives to improve a business **return on investment** by reducing work in-process **inventory** and associated **carrying costs**.

6) **Enterprise resource planning (ERP)**

ERP systems integrate internal and external **management information** across an entire organization, embracing **finance/accounting**, **manufacturing**, sales and service, **customer relationship management** and so on.

7) **Better Inventory Management**

It is the practices of the company which help by adding value in terms of having control over and maintaining lean inventory.

8) **Inventory Management**

Inventory management is the process of efficiently overseeing the constant flow of units into and out of an existing inventory.

9) **Customer**

Customer is the recipient of a **good**, **service**, **product**, or idea, obtained from a **seller**, **vendor**, or **supplier** for a monetary or other valuable consideration.

10) **E-procurement**

E-procurement is the **business-to-business** or **business-to-consumer** or **business-to-government** purchase and sale of **supplies**, **work**, and **services** through the **internet**.

11) **Outsourcing**
Outsourcing is any task, operation, job or process that is performed by employees within an organization, but is contracted to a third party for a significant period of time.

12) **Subcontracting**
Subcontract is a contract between a prime contractor and a subcontractor to furnish supplies or services for the performance of a prime contract or subcontract.

13) **Third party logistics (3PL)**
Third party logistics providers typically specialize in integrated operation, warehousing and transportation services to customers based on market conditions, demands and delivery service requirements for their products and materials.

14) **Safety stock**
Safety stock is a term used by logisticians to describe a level of extra stock that is maintained to mitigate risk of stockouts due to uncertainties in supply and demand.

15) **Material requirements planning(MRP)**
MRP is a procurement planning and inventory control system used to manage manufacturing processes.

16) **Warehouse management system(WMS)**
WMS is a key part of the supply chain which controls the movement and storage of materials within a warehouse and processes the associated transactions, including shipping, receiving, put away and picking.
17) **Advanced planning system (APS)**

APS refers to a manufacturing management process by which raw materials and production capacity are optimally allocated to meet demand.

18) **Decision support system (DSS)**

DSS is a computer-based information system that supports business or organizational decision-making activities.

19) **Lead time**

Lead time is the delay between the initiation and execution of a process.

20) **Production rate**

It refers to the number of goods that can be produced during a given period of time. Alternatively, the amount of time it takes to produce one unit of a good.

21) **Back log**

It refers to the value of unfulfilled orders, or the number of unprocessed jobs, on a given day.

22) **Cycle time**

The period required to complete one cycle of an operation or to complete a function, job, or task from start to finish. Cycle time is used in differentiating total duration of a process from its run time.

23) **Back order**

It refers to customer demand for a product or service which exceeds a company’s capacity to supply it.

1.14 DESCRIPTION OF THE QUESTIONNAIRE
The questionnaire of the study contains four sections. The first section contains a demographic profile of the executives of HLL Life care like gender, age, annual income, educational qualification, works experience and department details of employees.

The second section covers elements of SCM, company logistic department details and their logistic strategic plan and non-conformities regarding SCM.

The third section deals with executives perception towards systems benefits, problems and impact of SCM.

The fourth section is concerned with sufficient transport facility to logistic department, HLL’s existing production activities, SCM department problems during taking care of raw materials and performance of delivery activities of the department. This also covers future measure for supporting companies in SCM, aggregate planning activities and its parameter are included in the questionnaire to measure the performance of aggregate planning of SCM department. The vendors and supplier performance measurement metrics are added in this section. The measures like operational, financial and social performance cost management customer service, quality, productivity and asset management are presented.

1.15 LIMITATIONS OF THE STUDY

1. The study unit selected is only the health care industry in Trivandrum.

2. The sample is small because the researcher confines the study to the executive level of employees.

3. Getting the appointment to meet the executives is very difficult due to their official work and marketing engagements covering India and abroad.

1.16 CHAPTER SCHEME

This thesis contains eight chapters

The first chapter presents introduction about supply chain management, statement of the problem, the need for the study, the scope of the study, objectives of
the study, hypotheses used for the study, methodology, sample size, sample design, validity and reliability test, data processing, framework of analysis, framework of the questionnaire, limitation of the study and chapterization.

The second chapter covers the review of literature which is grouped into SCM practices-General, SCM practices in industries, benefits of SCM, impact of SCM and SCM and information technology, SCM and financial management and SCM and HR activities.

The third chapter deals with the SCM concepts, benefits, scope, components of SCM, elements of SCM and process of SCM.

The fourth chapter highlights the operational activities, branches of the industry, operational activities of the company and branches of the company.

The fifth chapter describes about the respondents' personal profile, respondents' perception towards benefits, problems and impact factors of SCM. The company logistics details and vendors and suppliers relationship measurement factors, aggregate planning of SCM department are clearly grouped based on percentage analysis.

The sixth chapter clearly analyses the significance of benefits, problems and impact factors using normalized t test. The benefits, impact and problematic factors are factorized by using factor analysis.

The seventh chapter highlights the influence of respondents demographic factors on benefits, problems and impacts factors and impact of benefits and problematic factors on impact factors. Structural equation model is framed to study the effectiveness of SCM practices of HLL Life care Ltd.

The last and final chapter presents the findings, suggestions, conclusion and scope for further study.