

# Supply Chain Collaboration Practices (A Study on Manufacturing Companies – Ethiopia)

PROFFESOR D.LALITHIA RANI

Department of Commerce and Management Studies, Andhra University, Visakhapatnam, India

Bogale Alemu Refu (PhD Research Scholar)

College of Arts and Commerce, Department of Commerce and Management Studies  
Andhra University, Visakhapatnam 530003

## Abstract

Supply chain collaboration has been a major component of competitive strategy to enhance organizational productivity and profitability. Collaboration is a recent trend in supply chain management that focuses on joint planning, coordination and process integration between suppliers, customers and other partners in a supply chain. Its competitive benefits include cost reductions and increased return on assets, and increased reliability and responsiveness to market needs. The research is entitled as “An Investigation in to the Collaborative Supply Chain Practices: A study on Ethiopia’s Steel Mil Manufacturing Companies. The investigation is aimed to scrutinize the orientation of the manufacturing companies to make use of the dynamic and multidimensional role of supply chain collaboration in the current serious competitive business world. To achieve this objective descriptive research method was used. The relevant data was gathered from both primary and secondary source. The sample respondents were selected using non probability sampling. Both qualitative and quantitative data analysis tools were used as per the nature of data. Accordingly, the major finding of this study shows a positive effect between the collaborative supply chain practices and the companies’ productivity. The finding also implies that there is direct relationship between the internal operations and performance level of the companies. However, the finding disclosed greater deal of attention should be given to the internal operation which is the base for an effective external integration. Furthermore, due attention has to be paid for the effective utilization of both information technology and information system.

**Keywords:** Supply chain, Supply chain management, Supply chain collaboration

## 1. INTRODUCTION

The role of supply chain management (SCM) has become increasingly important for firms in highly competitive markets, and we have recently seen, also in economic downturns... Ketchen & Hult (2007) describe this competitive rivalry among firms as “supply chain versus supply chain” instead of “firms versus firms”. A well-coordinated supply chain process is difficult to imitate for competitors since it becomes more difficult to compete on product level.

Therefore, Hult et. al (2004) describe that supply chain management is not anymore a support function in order to implement a business strategy; it is specifically meant to drive a firms’ performance and supply chain management becomes a key element of the overall strategy for the entire chain.

Currently, changes in the environment (socio-political, changing demand etc.) are the cause for increasing uncertainty in the market place. In order to deal with this, flexibility in the supply chain becomes more and more important.

Supply chain management involves operations like sourcing, products, delivery, and the information systems linking the supply channel participants (Serve *et al.*, 2002). The purpose of supply chain management is to reduce costs, introduce innovative products, make the operations run smoothly, meet uncertain demand with rapidly delivery and the satisfy customers in order to increase revenue, allowing businesses to confront the competitive market.

Furthermore, the business firms integrate the whole supply chain resources and need to co-ordinate their supply chain partners. To develop this, all the supply chain partners find that collaboration is a significant factor in allowing them to affect the whole supply chain channel (McLaren *et al.*, 2002, Simatupang and Sridharan, 2005b).

Collaboration has had a position within supply chain management and it has also been related to buyers and suppliers’ organizations since the 1990s. A simple description of collaboration is for two or more firms to work together to achieve their aim (Simatupang and Sridharan, 2002). Moreover, Bititci *et al.* (2004, p.252) state that: “*Accordingly, value creation in collaborative organizations should be a win-win-win situation for all parties concerned*”.

They pointed out that the motivation to collaborate arises from economic advantages in favor of the supply chain partners, from the suppliers to the buyers and the final customers.

As Wilding and Humphries (2006, p.313) pointed out: “it is also possible for collaborative enterprise to

bring operational advantages in the longer term as the partners become more effective as they develop through prior experience and active management of the learning process”.

Nevertheless, this research focuses not only on collaboration in the supply chain channel but also investigates the supply chain operations processes. The reason is basically to use the supply chain processes to determine the factors in supply chain collaboration. In other words, it is a kind of internal assessment for supply chain collaboration; this is very important for the companies to respond to buyers and suppliers. When the companies know how to operate their internal processes within supply chain collaboration, they can work more effectively with its buyers and suppliers.

The question is what is the real value for different supply chain collaborative partners and how can this value be maintained in a long-term collaboration relationship. This information could assist in understanding the motivation of the companies to do supply chain collaboration.

This study is to make a contribution to the field of supply chain collaboration. This research is expected to show that not only can supply chain collaboration play a significant role in team work but that it can also generate innovation between the internal and external supply chain in order to get more value from supply chain collaboration.

## 2. REVIEW OF RELATED LECTRATURES

### 2.1 Introduction

Since the 1990s, the importance of forming collaborations in order to provide an efficient supply chain, has attracted attention from both firms and academics (Chandra and Kumar, 2000; Barratt, 2004). The outcome of supply chain collaboration (SCC) includes revenue enhancement, cost reductions and operational flexibility to cope with high demand uncertainties (Simatupang and Sridharan, 2005b) in order to create more competitive capabilities and customer satisfaction. Cost reduction is leading to collaboration members having more agility in terms of their operations and catering for customers' competence to face rival businesses as well make more revenue.

### 2.2 Definition of supply chain management

Different definition has been given by different authors for the newly emerged management philosophy, supply chain management (SCM) even though these authors were relatively intended to mean the same thing especially on the fundamental concepts and principles. For clear understanding it will be useful to look at some definitions of supply chain management given by different authors.

Defee and Stank (2005, p.29) define supply chain management according to the Council of Supply Chain Management Professionals (CSCMP, formerly The Council of Logistics Management (CLM)) as follows:

*“Supply Chain Management encompasses the planning and management of all activities involved in sourcing and procurement, conversation, and all Logistics Management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third-party service provides, and customers. In essence, Supply Chain Management integrates supply and demand management within and across companies ([www.cscmp.org](http://www.cscmp.org))”.*

Supply chain management (SCM) involves many organizations in the integration of raw materials, the transformation of goods and the delivery of final products to customers in order to support all sections of the industry to create an efficient supply chain channel (Stonebraker and Liao, 2004).

Researchers have proposed several definitions of SCM, as follows:

Lummus and Vokurka (1999, p.11) described SCM as: *“all the activities involved in delivering a product from raw material through to the customer including sourcing raw materials and parts, manufacturing and assembly, warehousing and inventory tracking, order entry and order management, distribution across all channels, delivery to the customer, and the information systems necessary to monitor all of these activities”.*

The whole supply channel includes the participants, such as the suppliers, manufacturers, distributors, and customers, linked together so they can fulfill the multi-functions which provide low-cost, high-quality, and rapidly delivery to the marketplace in order to offer the customers product or service satisfaction.

Serve *et al.* (2002, p.246) defined supply chain management (SCM) as *“a technique for linking a manufacturer's operations with those of all of its strategic suppliers and its key intermediaries and customers”* and *“By establishing these supply based links, companies can build bridges and establish partnerships with suppliers, customers and carriers to more effectively reduce operating cost, improve customer service and expand into markets”.* In addition to this, *“Most successful supply chains have devised approaches for the participants in the supply chain to work together in a partnering environment”.* From this observation, it is possible to establish how the participants engage in the activities of the supply chain.

Other researchers have expressed similar ideas on integrating full participation in SCM. For example,

Harrison and van Hoek (2002, p.6) said that “*The alignment of upstream and downstream capabilities of supply chain partners to deliver superior value to the end customer at less cost to the supply chain as a whole*”. The term is used to describe the management of the flow of information, products and funds in between different stages of the chain.

**Figure 2.1: Typical Supply Chain Structure**

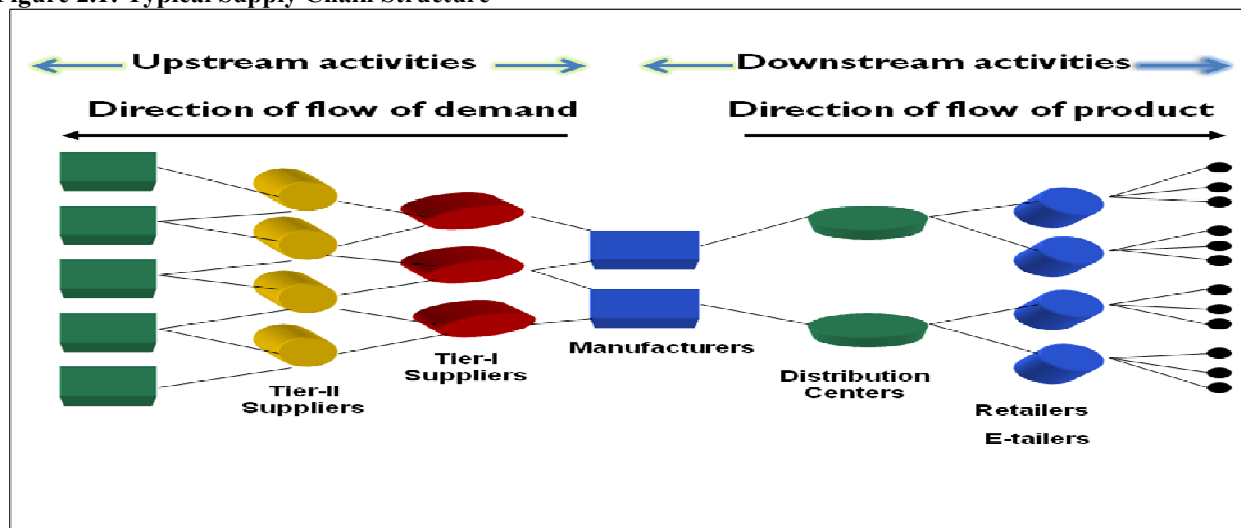


Figure 2:1 shows the elements present in a simple typical supply chain network. The suppliers (of raw materials, components, and sub-assemblies), manufacturing/assembly plants, warehouses (central, local, etc.), distributors, retailers, and customers make up the important players in a supply chain. The logistics function is also a key element for effective functioning of a supply chain. Logistics elements are required for agile delivery of raw material/components/sub-assemblies to the plants (supply logistics); and for rapid delivery of finished products to the customers (distribution logistics). A realistic supply chain may have multiple end products with shared components, facilities, and capacities.

## 2.4 Supply chain collaboration (SCC)

### 2.4.1 The motivation of supply chain collaboration

Supply chain lies no longer with an individual company. Either it will not able to be managed separately.

There is no doubt that the successful development of SCM performance has to focus on customers' needs and expectations (Svensson, 2003). Furthermore, the performance of the supply chains can affect customer satisfaction. Therefore, the goal of SCM is to meet the needs of the customers by supplying the right product at the right place, time, and price. In other words, the customer satisfaction is the goal of supply chain management.

In addition to this, one factor related to customer satisfaction, Lee and Amaral (2002) point out that SCM is anticipated to achieve well in terms of both costs and services from an operational perspective. That is why the best combination of operational activities has to be found, in order to ensure that the core objective of satisfying the customer requirements at the lowest possible cost is achieved. No single component can be seen disjointedly from the other; they have to be viewed through both the influence of the channel system and the critical effect.

Nowadays, the customer services are to be a kind of goal of customer satisfaction. Chung *et al.* (2007) referred to three approaches, the construct of a service system, after-sales service, and satisfaction investigation as a target for customer service.

The after-sales services include service satisfaction with the product, questionnaire feedback, acknowledgment letter delivery, telephone interviewing, and sales interviews. In short, the management of customer complaints is very important for organizations and they also need to respond to their feedback. Even though, in today's internet age, some steps can be taken on websites, there is also a need for more after-sales services management. This can lead to greater customer satisfaction in order to acquire more benefits within supply chain collaboration.

On the other hand, Aryee *et al.* (2006, p.947) said that “*The value to be gained from collaboration is manifested as enhanced business performance as a result*”. It is without doubt true that the performance improvement is the goal of supply chain collaboration but provides more opportunities in order to get more marketing fields, which is very important for supply chain collaboration.

Recent work by Millington *et al.* (2006, p.190) pointed out that “*In order to investigate the relationship between supplier adaptation to buyer requirements and ownership type, three measures of adaptation are defined: supplier investments, buyer control and buyer investments*”. The reason for requiring a supplier to relate

to a buyer groups is to build a good relationship and maintain it in order to gain more value from the buyer parts.

On the other hand, the important investments in transaction costs are based on the strategic value network. Buyer and supplier collaboration can be a good policy for supply chain members.

#### **2.4.2 The definition of supply chain collaboration**

Simatupang and Sridharan (2002) said that “A collaborative supply chain simply means two or more chain members working together to create a competitive advantage through sharing information, making joint decisions, and sharing benefits which result from greater profitability of satisfying end customer needs than acting alone.”

Therefore, collaboration, in the context of the supply chain, means sharing commitment, trust and respect, skills and knowledge, and intellectual agility between supply chain partners (Barratt, 2004). All of the members in the SCC chain have to integrate and act as a homogenous unit. In addition to this, the value is enhanced throughout the chain and the matching of supply and demand profits (Simatupang and Sridharan, 2005a). Consequently, SCC members’ joint decision making is preferable to create competitive advantage through mechanisms such as increased market access, better material sources, and cost-effective transportation.

In order to achieve this, the SCC members must have a very close relationship. The strategy is to focus on the collaborative partners’ relationship and improvements in the SCC process. Relationship orientation includes constructs such as trust (Sahay, 2003b) and power (Cox, 1999) because most collaborative partners are not equivalent in terms of bargaining power and, if a partner is to be trusted, that partner cannot take advantage of a relatively stronger situation or behave opportunistically.

Min *et al.* (2005) point out that collaborative processes include information sharing, joint planning, joint problem solving, joint performance measurement, and the leveraging of resources and skills. Information sharing becomes a regular norm that encompasses multiple levels across firms. In addition to this, they stated the information technologies include electronic data interchange (EDI), database, data warehouse and data mining techniques, and the internet to illustrate the collaboration channels. Joint planning relies on the fact that collaborative partners must work together to solve supply chain problems.

As a point, the success of collaborative efforts cannot be guaranteed until performance is correctly monitored and measured (Min *et al.*, 2005). This often involves jointly leveraging each other’s resource and skills. The leveraging skill is made possible by specialization.

#### **2.4.3 Elements of Supply Chain Collaboration**

Elements of supply chain collaboration are categorized in three categories (see figure 2.2): cultural elements includes collaborative culture, internal and external trust, mutuality, information exchange, and openness and communication. Second category represents the needed elements for collaboration to succeed: cross functional activities, process alignment, joint decision-making, and true supply chain metrics. The last group presents a number of strategic elements for the collaboration to be sustainable: resources and commitment, intra-organizational support, the corporate focus, demonstrating the business case, and the role of technology.



Figure 2-2 Elements of supply chain collaboration  
 Source: (Barratt, 2004)

### 3. SIGNIFICANCES OF THE STUDY

This study is to make a contribution to the field of supply chain collaboration. This research was expected to show that not only can supply chain collaboration play a significant role in team work but that it can also generate innovation between the internal and external supply chain in order to get more value from supply chain collaboration.

All in all, the five objectives of this research are to provide a detailed study about supply chain collaboration and develop findings about supply chain collaboration to contribute to both academia and practice.

Specifically, the investigation and result of this study about the contemporary global management philosophy which is the daily manager conversation at the edge of complex and dynamic business world is believed to have the under mentioned paramount significances:

- Indicate the level of awareness and actual performance of MAME Steel Mill PLC with regard to SCM and supply chain collaboration
- Indicate possible gaps between the supply chain collaboration level of the company and the customers service
- Serve as stepping stone for researchers who have similar interest to pursue investigation till the actual observed empirical gap
- Generally, it will be significant for all the consumers of the research such as academicians, corporate managers, policy makers, different industries, international traders and specifically, for the targeted company.

#### 4. STATEMENT OF THE PROBLEM

Companies which have recognized opportunities that exist there in the supply chain management and direct their effort towards developing a competitive supply chain based on speed, flexibility, innovation, quality and responsiveness had significantly improved customer service and thus profitability. Such strategic move is basically to reduce cost through increased efficiency and effectiveness. Therefore the primary goal of supply chain management is to enhance competitive performance by closely integrating the internal functions within a company and closely linking them with external operations of suppliers, customer and other channel members (Kim, 2006).

Supply chain management demand an ideally perfect state of implementation performance in business operations, all activities across the value chain should be orchestrated and coordinated as though a single entity to synchronize supply and demand at all level, the sharing of information technologies to increase innovation, to shorten product development cycle time, reduction in order cycle time, replacing stocks with flows, effectively and efficiently responding to the customers' demands, reduce cost and increased customer satisfaction (Russell, 2004).

First of all, companies are expected have awareness about the existence of supply chain and recognize the inbuilt opportunities so as to strategically plan and manage to optimize the system effectively. Particularly, in the current competitive and dynamic business world, supply chain lies no longer with an individual company. Either it will not able to be managed separately. Therefore, firms are required to collaborate along with other supply chain partners in a way that enables them to be mutually benefited and enhance their productivity.

According to Lee, et al. (2000), companies trading partner should get out of mere coordination and move towards collaborative SCM in an effort to reduce the information imbalances that result in dreaded "bullwhip" effect, while increasing their responsiveness to market demand and customer service. Collaborative supply chain goes beyond mere exchanging and integrating information between suppliers and their customer and involves tactical joint decision making among partners in the area of collaborative planning and forecasting, distribution and product design (Kim, 2006).

Collaborative supply chain systems are designed to support enhanced information sharing and collaborative planning among partners in an effort to reduce information asymmetries in the SC and they support collaboration primarily through three mechanisms namely: information integration, process and resource coordination and reporting of performance measures to ensure accountability (Lee, 2000). However, the traditional purpose built information systems, which we often term legacy system share often focused primarily on meeting only one of these objectives at a time, while more integrated systems such as enterprise resource planning (ERP) applications are better suited to meet all three requirements at a time. That means information system and information technology lies at the heart of an efficient supply chain management.

According to Tim McLaren et al. (2002), as cited by Eyong Micheal (2009), there should be an alternative IS and IT that gives breath to SCM which are broadly classified in to message based system.

The conventional wisdom in most supply chain management literature is that "the more collaboration, the better the performance of the supply chain" (Bagchi et al., 2005). SCM concept is defined as "collaboration of business processes" (Cooper et al., 1997). Lee (2000) argues that a truly collaborated supply chain does more than reduce costs. It also creates value for the company, its supply chain partners and its shareholders. The ideal situation is that the entire process across the supply chain is designed, managed and coordinated as a unit. This is also in accordance with other papers from 2000 onwards discussing supply chain integration and performance (Stock et al., 2000; cited by Fabbe- Costes and Jahre, 2007; Frohlich and Westbrook, 2001).

On the other hand, successful supply chain collaboration needs collaborative partners that understand each other and work together in order to suit the customers' requirements in advance so that can get more benefits and be competitive (Simatupang and Sridharan, 2005a). Despite common benefits, values and business practice there may be issues over linking buyers and suppliers. There is potential for mutually beneficial collaboration but to what extent is this being realized. By exploring current practice in supply chain collaboration, insight may gain into the development of successful chain collaboration and the issues that may present them from reaching their potential in delivering benefit to all partners. Therefore the following research questions were addressed.

#### Basic Research Questions

To better understand the core issues related to supply chain collaboration, the study was tried to answer the following sets of basic research questions:

1. How does supply chain collaboration is being practiced in *Ethiopia's Steel Mil Manufacturing Companies*?
2. Does the *Ethiopia's Steel Mil Manufacturing Companies* partner development strategy support collaborative supply chain practice?
3. What is the degree of internal operational integration of the *Ethiopia's Steel Mil Manufacturing*

*Companies?*

## 5. OBJECTIVES OF THE STUDY

The general objective of this study was to assess the collaborative supply chain practices of Ethiopia's Steel Mil Manufacturing Companies. Specifically, this study is aimed to achieve the under listed objectives:

- To provide empirical evidence on supply chain collaboration of the Ethiopia's Steel Mil Manufacturing Companies
- To assess partners development culture within the supply chain collaboration of the Ethiopia's Steel Mil Manufacturing Companies
- To assess the internal processes of the Ethiopia's Steel Mil Manufacturing Companies

## 6. RESEARCH DESIGN AND METHODOLOGY

### 6.1 Research Design

The study was to investigate the collaborative supply chain practices on the bases of fundamental theories, principles and management philosophies that are presumed to be effective parameters just to evaluate the actual performance of the manufacturing companies. Accordingly, the manufacturing companies existing practices were evaluated against the basic conceptual framework that was developed for this study. Therefore, the researcher preferred to use descriptive research, which helps to use both qualitative and quantitative data analysis.

### 6.2 Sample Size and Methods

Even though supply chain management is indispensable both for manufacturing and service companies, this study was particularly targeted to manufacturing industry that is believed to have relatively more vulnerability with respect to the collaboration practice.

On the top of that, it is found to be tedious in terms of time, cost and energy to encompass all manufacturing companies throughout the country. Therefore, the researcher selected Steel Mil Manufacturing Companies of Ethiopia. In order to select the exact sample size from the manufacturing companies' management and employees, the researcher has used purposive sampling.

It is a technique through which the researcher selects the sample size based on his/her judgment about some appropriate characteristics required from the sample members to serve a specific purpose (Zikmend, 2003). That is purposive sampling helps to address respondents those who have direct relationship with the issue at hand. Where as convenient sampling was used to contact the customers who buy frequently from the companies and order customized products both as per their arrival/availability at the companies and at their own premises. Therefore, to determine the sample size, the researcher preferably used the method developed by Carvalho (1984), as cited by Malhorta Naresh, k. (2007).

**Table 6.1 Sample Size Determinations**

Population Size	Sample Size		
	Low	Medium	High
51-90	5	13	20
91-150	8	20	32
151-280	13	32	50
281-500	20	50	80
501-1200	32	80	125
1201-3200	50	125	200
3021-10,000	80	200	315
10001-35000	125	315	500
35001-150,000	200	500	800

(Source: Malhorta Naresh, Marketing Research: an applied approach, 2007).

Accordingly, the total population of the Steel Mil Manufacturing Companies are 1170, out of which 125 were selected purposively as a sample respondents as per the Malhorta Naresh's sample determination method. Whereas, the researcher conveniently selected sample size of 200 customers as a sample respondents out of 3150 registered customers as a loyal and has purchase experience of two years and above with the companies.

### 6.3 Nature and Source of Data

While deciding about the nature and source of data to be used for the study, it is obvious to keep in mind two types of data, primarily and secondary (Zikmund, 2003). The primary data those which are collected a fresh and/or the first time, and thus happen to be original in character. The secondary data, on the other hand are those which have already been collected by someone else and which have already been passed through a statistical process (C.R. Kothari, 1990). The selection of a method must balance several concerns including resource

availability, creditability and analysis and reporting and the skill of the evaluator (Zikmund, 2003). Therefore, in this study, both primary and secondary source of data were utilized through questionnaires, interview, and literature review so as to substantiate the study with relevant information and evidences.

#### 6.4 Methods of Data Collection

Data collection means gathering data and information to addressed questions of the investigation (Zikmund, 2003). In order to substantiate the investigation and to collect the pertinent data, it calls for an appropriate and convenient technique of data collection. Accordingly, in this study, questionnaire and interview were used.

#### 6.5 Method of Data Analysis

The term analysis refers to the computation of certain indices or along with searching for patterns of relationship that exist among data groups (C.R.Kothari, 1999). Accordingly, the analysis of data for the current study was carried out using both qualitative and quantitative methods.

##### ❖ Validity and Reliability Testing

Establishing the validity and reliability of the instrument is an important aspect of instrument development and testing. Validity and reliability are the benchmark for assessing the quality of the instrument (Saunders, 2002). The researcher took different steps to ensure the validity of the study. Accordingly, before the administration of the instrument for the subject, survey questionnaires were made based on literature review and frame of reference to ensure the validity of results. And then, the questionnaire has been pre-tested by experts from Logistics and Supply Chain Management and Marketing and Sales Management to see the content and construct validity. Following the experts recommendation, the modified draft questionnaire was developed and distributed to the target respondents.

**Reliability:** Reliability measures the tendency of the instrument to consistently give the same result with the same group of people under the same condition (Sanders, 2002). In other words, reliability is to mean accuracy, dependability, consistence and stability. The SPSS software package offers “Reliability Alpha Cronbach’s was used in this study. Eventually, Cronbach’s Alpha ( $\alpha$ ) was measured and found to be 0.73, which is acceptable. Some of the major findings of the study are shown on the following table and discussed under the summary of major findings below.

**Table 6.2 Descriptive Statistics of Suppliers’ Partnership, Company’s Relationship with Partners, Internal Facility and Internal Integration Respectively.**

S/N	Items	N	Mean	Std. Deviation
1	The company is commitment to suppliers	34	4.11	.977
2	Risk sharing among the partners	33	3.57	.751
3	Mutual benefit between	33	4.09	.842
4	willingness to solve any problem	34	4.14	.821
5	Company’s level of flexibility.	34	3.82	.575
Group mean value			3.95	
S/N	Items	N	Mean	Std. Deviation
1	Strong relationship between the company and SC partners	34	3.85	1.209
2	Joint developed strategic objectives	34	3.58	1.209
3	The level of top management involvement	34	3.88	.977
4	The level of senior management interaction	34	3.88	.913
5	SC partners performance monitoring	34	3.41	.856
6	Monitoring partners performance on monthly bases	33	3.12	.780
7	Closely monitoring wholesaler and retailers performance	34	3.52	.928
Group mean value			3.6	
S/N	Items	N	Mean	Std. Deviation
1	Advanced material handling system	34	4.32	.767
2	Technologically advanced machineries and equipments	34	4.41	.743
3	Incorporated SC issues under strategic plan	34	3.47	.861
4	Internal information system is well designed.	34	2.38	.853
5	Customers’ information across the functional departments.	34	3.85	.743
Group mean value			3.68	
S/N	Items	N	Mean	Std. Deviation
1	Level of employees awareness about SCC	34	3.91	1.111
2	The extent of visibility of the internal systems	34	3.20	1.066
3	Up to date information sharing across the functional unit	34	3.08	1
4	Level of coordination among the functional units	34	3.94	.919
5	The company has effective production scheduling techniques	33	4.03	.847
Group mean value			3.63	

Source: Researcher’s survey



## 7. SUMMARY, CONCLUSION AND RECOMMENDATIONS

### 7.1 Summary of the Findings

The aim of this research was to investigate the collaborative supply chain practices of Ethiopia's Steel Mill Manufacturing Companies. In the study, it was necessary to discuss the elements of supply chain collaboration to address the research objectives as the key points for this study. From here, the research objectives are divided into three parts: empirical evidence of supply chain collaboration, estimations of supplier development within supply chain collaboration and the internal processes.

Out of one hundred and twenty five (125) questionnaires administered for the target respondents from the manufacturing companies, one hundred and six (106) of them were returned back filled and used as a valid base for quantitative analysis. On the other hands, out of two hundred questionnaires distributed for the customers, one hundred and seventy five (175) of them were accepted and used for quantitative analysis as well. Furthermore, qualitative analysis was made for the detail interview handled with both the targeted managers of the manufacturing companies and the contacted customers. Based on both the quantitative and qualitative analysis, discussion of the results with respects to the basic questions was presented. The following are the summary of major findings of the study as indicated in the above table 5.2.

- With respects to empirical evidence of supply chain collaboration, both the qualitative and quantitative analysis revealed that, one of the key enablers of supply chain collaboration, which is Information Technology (IT) application of the companies is poor. Even if there is internet connection in the companies, it is not sufficient enough to share the information with internal of the companies and to support the external partners. Almost it can be said that all of the transaction process is on paper work bases. Due to this, the frequency of information sharing between the companies and its supply chain partners is low which results with less collaborative planning, forecasting and replenishment practices (CPFR).
- Regarding to supplier development within supply chain collaboration, quantitative analysis conveys that, desirable relationship between the companies and their suppliers is observed. The current supplier management of the companies focused on the suppliers who can reduce costs and improve performance in their provision of raw materials. It was also revealed that, the companies' supplier development starts from their quality, cost and delivery process and then their technology skills.
- Quality perspective was among some of the parameters that were used to measure the internal process of the companies. Accordingly, both quantitative and qualitative analysis revealed that, the manufacturing companies focused mainly on product quality control using technologically advanced machineries. In relation to efficiency and effectiveness, the descriptive data conveys that higher efficiency and lower effectiveness of the companies. As a result, poor customer services were observed in terms of volume flexibility and consistency of delivery.

### 7.2 Conclusion

The scope and level of collaboration in supply chain has raised questions during years through different literatures. Some believe that total integration and close collaboration with supply chain partners in all areas is the answer to this dilemma (Cooper, et al., 1997; Lee, 200).

In conclusion, at the start of this research, the aim was to study supply chain management theory and learn more about supply chain collaboration in actual setting. Accordingly, Ethiopia's Steel Mill Manufacturing Companies orientation towards SCM is somewhat successful. However, it lacks balanced efficiency and effectiveness that would enables the companies to be competent enough in the industry.

Regarding to the internal integration of the companies, one of the parameters used to measure this was quality which enable to measure the companies' performance from different perspectives. Accordingly, even though the companies are manufacturing quality products, there is the absence of successfully transferring the issue of quality in to other parts of the organizations (internal integration, customer service, investment on collaboration and the like) that would enhance the overall performance of the companies.

Finally, even though promising supply chain collaboration (SCC) is being practiced in the manufacturing companies, information technology and information system which are the heart of supply chain management (SCM) are not given due attention and the companies are poorly performing in this regard.

### 7.3 Recommendations

Based on the findings of the study and the conclusions reached, the following recommendations are made by the researcher:

1. It was clearly explained that internal integration is vital in enhancing the potential of the company to get an external successful collaboration with supply chain partners. Hence, Ethiopia's Steel Mill Manufacturing Companies are recommended to integrate the internal operations successfully so as to bring about flexibility, higher responsive level and the like. This can be organized through networking

the functional units of the organizations with appropriate information technology and information system.

2. The actual competitive advantage of the companies is mainly relying on quality. But theories and empirical findings suggest that quality alone would not be sustainable as a competitive advantage for longer time. Therefore, it is worthwhile to encourage innovation through organized research and development (R&D) works in order to increase the frequency of innovation. On the other hand, frequent innovation in design, new product and features combined with supplier quality eventually boosts the companies' competitiveness.
3. It has been discussed so many times that, information technology (IT) and information system (IS) are found at the heart of supply chain management (SCM). Furthermore, supply chain collaboration (SCC) that is supported by both information technology and information system will definitely result with cost reduction and enhancing customer service in return. Therefore, Ethiopia's Steel Mill Manufacturing Companies are recommended to do a lot in this regards.

## 8. LIMITATION OF THE STUDY

Due to the broad nature of the field and difficulty of manageability, the researcher used a particular framework to evaluate the status of supply chain collaboration that may not be sufficiently comprehensive.

The research sample didn't incorporate the upstream side of supply chain partners' namely: suppliers due to time constrained, so that one should be cautious using these results to draw broad conclusions because of limited sample size utilized for the analysis.

The other reason is that, some respondents interviewed could not answer the all questions fully and so some aspects are not covered.

## 9. SUGGESTION FOR FUTURE RESEARCH

Further research can be viewed in two paths: however this study was centered on the downstream of supply chain management (SCM), one can perform similar study by integrating both upstream and downstream sides of SCM at a time. Because supply chain collaboration (SCC) must not only be start from buyers and suppliers collaboration, but also from suppliers' and suppliers collaboration. Furthermore, future researchers who are interested in the same area can look in to the effect of supply chain collaboration (SCC) on bullwhip effect.

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