

Collaborative Supply Chain Practices and Prospect of Companies in Bangladesh

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Abstract

Over the past decade, firms have adopted supply chain management as a critical element of their corporate strategies. Collaboration is a recent trend in SCM that focuses on joint planning, coordination, and process integration between suppliers, customers, and other partners in a supply chain. The aim of this paper is to investigate collaborative supply chain practices in Bangladeshi companies. Then it was compared with the developed countries industries. After establishing an effective collaborative system the realized benefit of collaborative supply chain management has been depicted. In this paper we have proposed a collaborative model for the effective design and execution of supply chain collaboration from CPFR. To investigate Bangladeshi industries collaborative practice a questionnaire was designed.

Keywords

Supply chain management (SCM), Supply Chain Collaboration, collaborative planning forecasting and replenishment (CPFR), profit sharing, point of sales data (POS)

1. Introduction

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. It involves operations like supplying, products, delivery, and the information systems linking the supply channel participants [1]. 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. Collaboration integrates operations in order to co-ordinate different firms but they must be aligned in the supply chain and need to understand more about the firms within supply chain channel. Collaboration means that companies involved are working together to meet one common objective. Collaboration is characterized by the sharing of information, knowledge, risk and profits [2]. The aim of this paper is to investigate collaborative supply chain practices in Bangladeshi companies. In this paper some Bangladeshi industries are investigated to determine the pattern of collaborative practice they perform. Then it was compared with the developed countries industries. After establishing an effective collaborative system the realized benefit of collaborative supply chain management was depicted. In this paper a proposed collaborative model is formulated for the effective design and execution of supply chain collaboration from CPFR for Bangladeshi industries perspective. The appearance of supply chain collaboration has produced effective supply chain operations but it is also important to learn from one's collaborative partners in order to create intensely collaborative relationships with them. Without doubt, the major point is the relationship within the supply chain collaboration, which relates to trust and commitment, to form a good network in order to attain the value of collaboration. Perhaps a powerful buyer or supplier can control the supply chain collaboration but also needs to become aware of the supplier development within the supply chain channel. In addition, the suppliers and suppliers on horizontal collaboration may be a new concept for supply chain collaboration but possibly will bring other challenges for the supply chain partners.

2. Collaborative Model

There are three types of collaborative model. Examples of such model include vendor-managed inventories (VMI), efficient consumer response (ECR), and more recently the use of Collaborative, Planning, Forecasting, and Replenishment (CPFR) models.

2.1 Vendor Managed Inventory

Vendor Managed inventory (VMI) was developed in the late 1980s in an effort to reduce inventory and stock-outs at retail stores. In a VMI configuration, tasks traditionally performed by a retailer – like stocking and ordering product is managed by the supplier of the product.

2.2 Efficient Consumer Response

Efficient Consumer Response (ECR) started in the early 1993 as a voluntary group in the grocery industry to use technology and strategic alliances to reduce costs. The ECR movement is based on the principle of just-in-time inventory management. ECR has four key areas: (1) efficient replenishment, (2) efficient promotion, (3) efficient introduction, and (4) efficient assortment.

2.3 Collaborative, Planning, Forecasting and Replenishment

Collaborative Planning, Forecasting, and Replenishment (CPFR) guidelines formalize the processes between two trading partners used to agree upon a joint plan and forecast, monitor success through replenishment, and recognize and respond to any exceptions. CPFR is a further development of Efficient Consumer Response on the supply side. It represents the second generation of ECR [3]. The model is segmented into steps, these are:

Step 1: Develop collaboration arrangement

Step 2: Create joint business plan

Step 3: Create sales forecast

Step 4: Identify exceptions for sales forecast

Step 5: Resolve/ Collaborate on exception items

Step 6: Create order forecast

Step 7: Identify exceptions for order forecast

Step 8: Resolve/ Collaborate on exception items

Step 9: Order Generation

The process model is segmented into three stages. The first stage is planning, and involves Steps 1 and 2.

The second stage is forecasting, and involves Steps 3 through 8. The last stage, replenishment, consists of Step 9.

3. Methodology

The methodology is divided into three sections discussing: (1) selection of companies for the study, (2) Source of data, (3) Questionnaire Design for Interviews of Companies

3.1 Selections of Companies for the Study

For this study the industries which selected are, cable industries like Bangladesh Cable shilpa limited(BCSL), BRB cable industries Ltd, Paradise cables limited and Akij Jute Mills Limited some agricultural industries and the RMG (readymade garment) industry in Bangladesh

3.2 Sources of Data

There are mainly two types of data based on the sources of availability – primary and secondary. Primary data are first hand data. They are the outcomes of interviews, questionnaire, emails, phone calls etc. On the other hand, secondary data collected, stored and used before and available in books, articles, journals, other printed materials, and internet and so on. Both kinds of data is used in this study. As a lot of work has been done before on supply chain efficiency or performance and the RMG (Readymade Garments) industry in Bangladesh, we were able to collect some data from secondary sources. Rest of the case specific data were collected as primary data through questionnaires, emails and telephone calls.

3.3 Questionnaire Design for Interviews of Companies

The interviewees are from purchase, logistic, and sales departments, as well as from the sales departments of their suppliers companies. The Table 1 shows the main categories of the questions which have been asked to different companies above departments.

Table 1: The main categories of the questions

Research Objects	Literature quotes	Sources	Main interview question
1.	Company background, history and culture		
Key competencies	Evidence of entrepreneurial behavior within the company		1. What is the key competency in the company?
2.	To provide empirical evidence On supply chain collaboration		
Suppliers' selection Key suppliers	Supplier selection is a crucial process that addresses how organizations select strategic suppliers to enhance their competitive advantage.”	[4]	2. How does the company choose its key supplier within SCC? (price, quality, local suppliers)
Agreement	“First, the engagement process aim to identify the strategic needs of collaboration, find the right partners with the right capabilities and set mutual agreements concerning performance.”	[5]	4. Does the company have a contract with the SCC?
Commitment Trust	“The cooperative efforts of channel members should result in greater trust, commitment, channel efficiency and the achievement of goals, thus leading to higher levels of satisfaction”.	[6]	5. How does the company trust its SCC partners? To what degree does the company trust its SCC partners?
Partnership	“Positive uses of power tend to lead to stronger supply chain relationships, which in turn lead to improved performance”.	[7]	9. How does the company maintain its partnerships with SCC partners?
3.	To evaluate supplier development within supply chain collaboration		
Relationship	“In our understand, the supplier needs to offer value to the customer but also needs to gain benefit from the customer at the Same time.	[8]	11. How is the relationship between the company and its SCC partners? (From suppliers to buyer to customers)
4.	To investigate the internal processes of supply chain collaboration		
Internal facility processes	“Vertical integration may also facilitate stabilization of production quality or quantity”	[9]	16. Does the company integrate the whole supply chain channel? (If yes, why and what is the benefit of this?)
5.	To examine the outcomes of supply chain collaboration		
Competitive capabilities	Supply chain collaboration is often defined as two or more companies working together to create a competitive advantage and higher profits than can be achieved by acting alone.”	[10]	24. Does the company gains any competitive advantage from SCC?
Suggestion Future plans for Collaboration	“The advent of supply collaboration creates the need, at the intercom any level		28. What kind of problems do supply chain partners have during the collaborative processes? 29. Does the company have some future plans for SCC?

After developing these questionnaire then interview taken from the personnel and employer from purchase, logistic, and sales departments, as well as from the sales departments of their suppliers of various companies.

4. Data Analysis

From various industries the interviewees are from purchase, logistic, and sales departments, as well as from the sales departments of their suppliers companies. Then it has been compared between Bangladeshi company's collaboration levels to developed countries.

4.1 Purchase and Sales data of (BCSL):

For Bangladesh Cable Shilpa Limited (BCSL) purchase and sales data are illustrated below. Here in the following the purchase and sales data for 2009-2010 for Bangladesh cable shilpa limited (BCSL) is illustrated respectively in Table 2 and Table 3

Table 2: Purchase data for 2009-2010

Name of the raw material	Purchasing country	Purchase order date	Quantity purchase (metric ton)	Price per metric ton \$	Total price \$
Black PE	UAE	07-07-2009	33	1650	54450
Black PE	UAE	08-09-2009	100	1260	126000
Copper wire	Bangladesh BRB	08-09-2009	60	7341	440460
Petroleum jelly	India	09-09-2009	10	1295	12950
Aluminum foil	India	24-01-2010	12	3200	38400
Petroleum jelly	India	31-01-2010	30	1330	39900
Copper wire	South Korea	31-01-2010	100	7199	719900
Black PE	Singapore	09-02-2010	100	1600	160000
HDPE	Singapore	09-02-2010	33	1600	52800
Polymer foil	India	11-02-2010	3	2700	8100

Table 3: Sales data for 2009-2010

Date of sales	Buyer	Quantity (ckm)	Amount \$
15-07-2009	BTCL and others	5000	194285
14-08-2009	BTCL	7600	278571
07-09-2009	BTCL and others	4000	200000
05-10-2009	BTCL and others	8000	350000
18-11-2009	BTCL and others	5000	171428
03-12-2009	BTCL	11000	350000
06-01-2010	BTCL and others	11000	285714
18-02-2010	BTCL	4500	171428
13-03-2010	BTCL	30000	714285
08-04-2010	BTCL and others	13000	357142
15-05-2010	BTCL and others	11000	342857
02-06-2010	BTCL	20000	707142

The data for other companies like BRB cable industries Ltd. Paradise cables limited was also collected. We have also visited Akij jute mills limited and collected our required data and answer to the questionnaire which described in the methodology

4.2 Information sharing scenario among partner of supply chain for Bangladeshi and developed countries industries

From survey some criteria of information sharing are developed. These criteria are follows:

1. Promotional plans
2. Business objectives

3. Order/Replenishment Plans
4. Sales forecast
5. inventory status
6. POS data
7. product/design
8. other

Then these criteria of information sharing are investigated in developed countries industries. And then it is investigated from the survey for Bangladeshi industries. Figure 1 shows the scenario of information sharing on these criteria for developed countries industries and for Bangladeshi industries. From the figure it is seen that the percentage information shared between supply chains partners for these criteria is very poor for Bangladeshi industries relative to developed countries

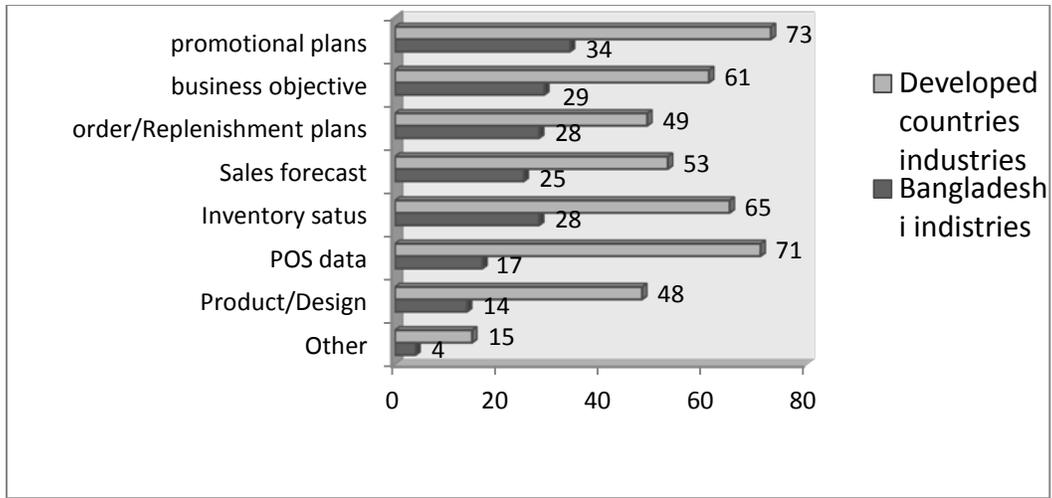


Figure 1: Information shared with partner for developed country industries and Bangladeshi industries

From the survey of different industries was performed to determine how the industry felt about collaboration is showed in figure 2. It is observed from the pie chart that supplier, manufacturer, distributor, retailer and customer felt about collaboration are respectively 31, 36, 9, 11, and 13%. So from the figure it is clear that the supplier and manufacturer felt more about collaboration.

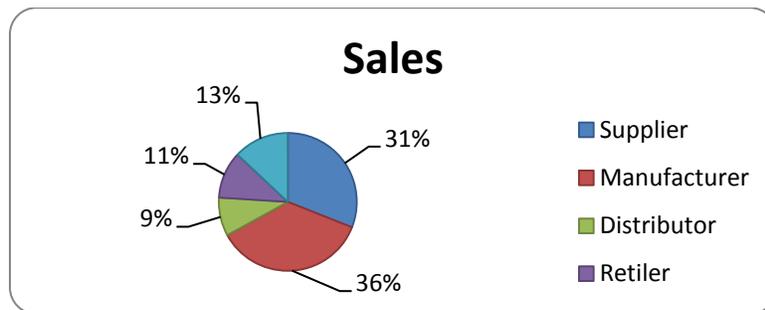


Figure 2: Survey result of how industry felt about collaboration

In figure 3, for example, the real demand as reflected by the POS data is relatively flat, but the inventory level at the warehouse becomes very fluctuating because of such factors as batching and order lead-times. For the same POS data, if collaborative relationship among supply chain partners was implemented by sharing the demand data with the manufacturer, i.e., in BCSL for drop wire, the performance is greatly improved, as shown in Figure 4. Instead of the highly fluctuating inventory level used by the warehouse in Figure 3 the warehouse inventory is much reduced.

Moreover, the inventory level for the retailer is also reduced. This is due to the reduced uncertainties and shorter lead-times when collaboration is used.

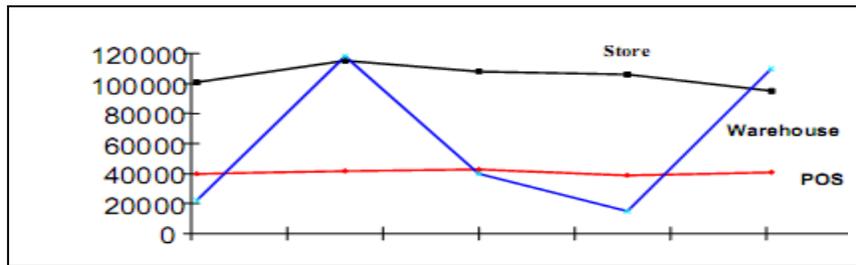


Figure 3: Inventory Levels for Drop wire in BCSL without collaboration

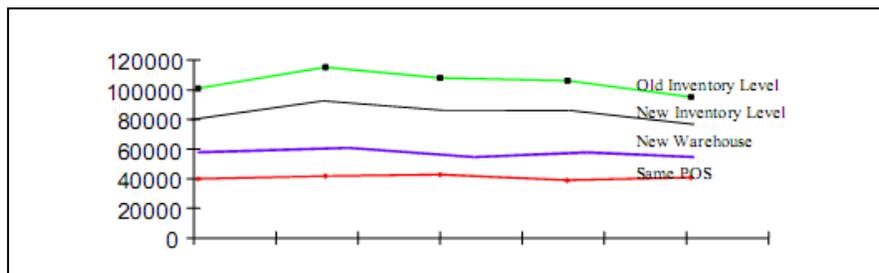


Figure 4: Inventory Levels for Drop wire in BCSL with collaboration (proposed model)

5. Result and Findings

From the survey it has been find out that with lack of collaboration Bangladeshi industries are facing lots of losses in some major areas. These can be minimizing by formation and implementation on of effective collaborative model.

5.1 Effect of Lack of Collaboration

Lack of collaboration has a negative impact on the supply chains performance. These condition moves the supply chain away from the efficient frontier by increasing cost and decreasing responsiveness. For lack of collaboration companies of Bangladesh have loss in the following supply chain performance illustrated in Table 4.

Table 4: Impact of lack of collaboration for Bangladeshi companies

Performance measure	Impact of lack of collaboration
Manufacturing cost	Increase
Inventory cost	Increase
Trading partner relationship	Decrease
Service level	Decrease
Replenishment lead time	Increase
Transportation cost	Increase
Shipping and receiving cost	Increase
Profitability	Decrease
Forecast accuracy	Decrease
Warehousing cost	Increase
Material acquisition cost	Increase
Internal communication	Not sufficient
Asset utilization	Low
Freight cost	Increase

5.2 Realized Benefit of Supply Chain Collaboration

If collaborative model is implemented in Bangladeshi industries then a lot of benefit may be gained which is shown in figure 5. For companies planning CPFR projects, the highest goal was increasing the quality of service for customers and cutting inventory costs. Increasing sales was followed by shortening the “time to market” (TtM) with new products.



Figure 5: Realized Benefits of collaboration with supply chain partners

5.3 Proposed Collaborative Model

From collaborative planning, forecasting, and replenishment model a proposed information model is proposed for Bangladeshi industries which is shown in figure 6. As a result of data requirements used to communicate among the supply chain members have been identified, these data requirements are a set of objects; they are grouped into seven units of functionality: top level, supplier, manufacturing plant, distributors, warehouse, transportation administration and retailers. The manufacturing plants manufacture product by using the raw materials provided by the suppliers. The distributors store inventories and supply the products to customers through retailer. The top level, manufacturing plant and warehouse might belong to the same company. The warehouse meets the uncertainty of demand i.e. reduced Bullwhip effect. They can share management information at any time by a common data base system. The transportation administration gives smooth flow of materials to customer & optimization of inventory level. The information which flows among chain members, stored in the top level data base. By using this information the top level can evaluate the efficiencies and effectiveness of each chain members. Using the central data base system, an individual member exchanges the data with other members to synchronize their business operations. These data are often used to control operations in an individual firm and are used for negotiation among chain members that form a virtual organization to provide product and services to customers.

6. Conclusion and Recommendations

This paper was concerned with finding a framework for developments of collaborative model within supply chain partners for Bangladeshi industries. here will discuss about the probable solution to minimize the inefficiency in the collaboration of the supply chain.

6.1 Probable Solutions to minimize the effect of inefficiency in the collaboration:

The main objective of this study was to identify the factors that affect the efficiency of performance of supply chain collaboration of Bangladeshi industries. So, here in the conclusion part, we will discuss about the probable solution to minimize the inefficiency factors and improve the efficiency of supply chain collaboration. Some probable solutions are described below as per the factors identified in our research question for collaboration are shortly given below-

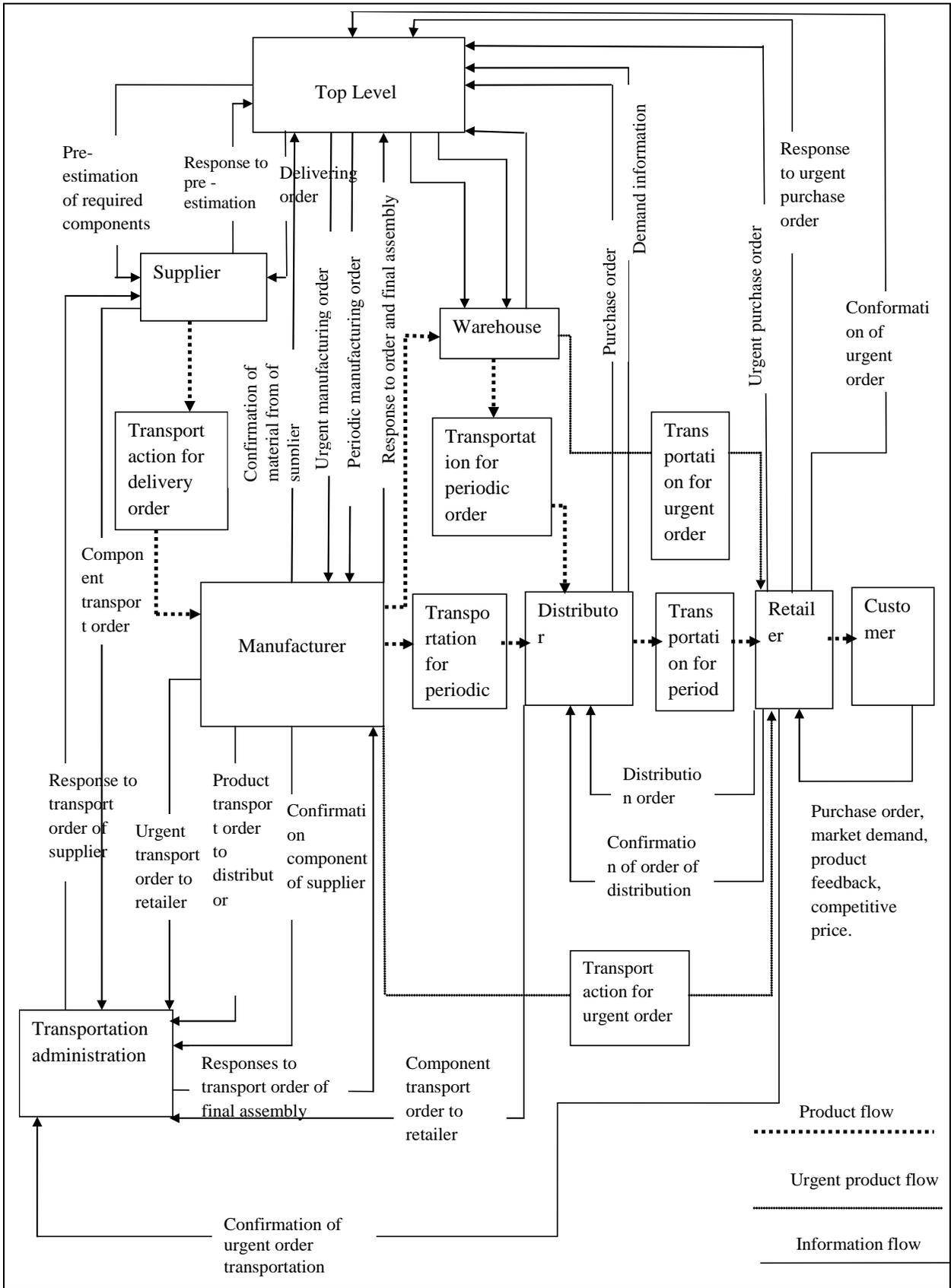


Figure 6: Proposed collaborative model

6.1.1 Lengthy Process of Order Issuance

A lot of steps are involved in the order issuance process. The concerned authority of companies should eliminate or integrate some steps with others to accelerate the lead time of total supply chain process.

6.1.2 Unavailability of Raw Materials

This is the most time consuming factor in the supply chain process of the industries. Because, in most of the cases suppliers need to source the raw materials from abroad, that demands a longer lead time. To overcome this situation, following steps may be taken-

Bonded warehouse: A common bonded warehouse may be the solution of raw materials scarcity. If the frequently used raw materials can be stored in warehouse, then suppliers can purchase the materials within a very short time and it helps to decrease their ultimate lead time of the shipment. As the imported materials in bonded warehouse are duty free, so this initiative will be cost effective as well.

Establishment of backward linkage: Although read made garment sector has been boosted up significantly in Bangladesh, the backward linkage sector, like- textile, spinning and fiber have not been established in that way. If these sectors can be developed like RMG sector, then suppliers will not need to source the raw materials from abroad.

6.1.3 Political Instability:

Government should take the initiatives to keep the industries free from political instability.

6.1.4 Insufficient Technological Infrastructure

Cable testing technologies are not sufficient in Bangladesh. There are some sophisticated cables that are not possible to test by the existing facilities of laboratory. So, laboratories with the latest technology should be set up in Bangladesh. Necessary computerized technology may be set up in the suppliers' plant area to launch the digital sampling system. Besides these, different kinds of software, bar code labeling, EDI and RFID technology should be set up at supplier's own initiatives to decrease the lead time and developed collaborative relationship among supply chain partners.

6.1.5 Retention of Authority

Management and decision making power should be decentralized in the supplier's company. If all the concerned employees get freedom in decision making instantly regarding any problem, then operation becomes faster, which helps in the development of supply chain collaboration.

6.1.6 Time Involving Quality Check/re-check

Quality inspection team of buyer company may conduct a pre-discussion with the supplier before visiting the factory and fix up a date in the convenience time of the supplier so that productivity in the supplier's factory is not affected.

6.1.7 Inadequacy of Transportation Facility

To avoid the excessive traffic jam in the day time, suppliers may choose the mid night as the delivery time of the products, when roads are almost free from traffic cohesion. Local authority of government should be aware to the factories regarding the construction of road facilities.

6.1.8 Lack of Proper Technical Knowledge

Factory owner may engage some people who are technically sound to the machineries and equipment or some people from inside the organization may be well trained up to provide the quick service for avoiding the unexpected production break.

6.2 Limitations of the Study

The main limitations of this research are due to a limited research budget and time. The first reason for three cases restraint was on the interview time available, making it difficult for the researcher to observe the whole process of supply chain collaboration. Secondly, some respondents interviewed could not answer the all questions fully and so some aspects are not covered. One of the problems was that some of the interviewees do not really have contact with

the suppliers and customers. Their work is related the internal and external aspects of supply chain collaboration operations.

6.3 Recommendations

There are a number of recommendations for future research from the findings of this research. As our thesis was mainly focused on investigating factors that affects supply chain collaboration in Bangladeshi companies. Supply chain collaboration can not only start from buyers and suppliers collaboration but also from supplier and supplier collaboration. In addition to this, suppliers may need to think about how to be a key supplier for their buyer. Suppliers could give more thought to suppliers' management. Suppliers could develop strategic plans in order to develop long-term relationship with collaborative partners. This can be done with suppliers, as well as buyers. The suppliers' development needs more attention from academic and practical perspectives to rewrite the supply chain collaboration projects within supply chain management.

Acknowledgement

We would like to express our sincere gratitude, recognition and special thanks to a lot of persons engage with industry. This work would not have been possible without their encouragement. We would like to extend my sincere regards to Engr. Sirajul Islam, Dy. Manager (Production) BCSL, who provided supervision in the early stages of this research programme. I would also like to thank Engr. Md. Jahangir Rashid, Engr. Md. Mizanur Rahman, Engr. Rupali Biswas, and Engr. Md. Samad. We also like to convey thanks to the all staff in the purchase, logistic, and sales departments, as well as from the sales departments of their suppliers companies of all the companies we have visited. They always give us a warm greeting and help.

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