

## Performance Measurement of Service Supply Chain Management of Steel Industry on Dealers' Perspective – The Case of Bangladesh

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### ABSTRACT

Though the increasing attention for the supply chain management (SCM) practices in the industry but the service supply chain management (SSCM) has not been explored. For effective supply chain practice, a company needs to assess the performance. This study has been conducted to measure the performance of service supply chain management of the steel industry on dealers' perspective. Based on the operation, customer service and corporate management performance in a service supply chain, the measurement has been done on BSRM, the top and highest-producing steel company in Bangladesh. The emphasis is on performance measures dealing with service supply chain processes such as responsiveness, flexibility, reliability, tangibles, assurance, empathy, profitability, cost and resource utilization. Surprisingly the surveyed dealers are quite satisfied with each sector of BSRM. It has also been seen that BSRM (47.62%) is the first choice of the dealers and in every aspect of year of experiences of the dealer; BSRM has achieved the leading position. The dealer with more than 15 years of experience also prefers BSRM (59.1%) while measuring the SSCM operations. Further analysis on this issue with more measurement tools will be benefited for the different industry of home and abroad.

**Keywords:** Service supply chain management, supply chain management, Performance, Dealer, Steel Company

### INTRODUCTION

A supply chain is a network that linked the forward integration with its backward integration to deliver the products and services to the final user that is the customer (Stadtler, Kilger & Meyr, 2015). The chain also involves two or more organizations to provide the respective products and services to the final user. Supply Chain Management (SCM) consists of the entire parties concerned in all directions to fulfill customer appeal. The supply chain is not limited within the manufacturing industry; its uses also are in the transportation, retailing activities, warehouse and also the customer as well (Chopra and Meindl, 2004). Baltacioglu, Ada, Kaplan, & Yurt (2007) define the service supply chain as the set of connections with those service-oriented organizations that provide and produce services. In recent eras, services have taken a vital role in the world. This service economy has good command for the growth of developed countries in the world (Giannakis, 2011). However,

regardless of the importance of the service economy, services now become a big role player in comparison with manufacturing (Van, Mahony, & Timmer, 2008). SSCM enhances customer service by assuring the availability of products and lowering the cost of order cycle time (Banomyong & Supatn, 2011).

According to Wikipedia-Bangladesh Steel Industry (2019), the steel industry is recognized and rising manufacturing in Bangladesh. Mainly because of a port facility in Chattogram, the business has appeared as the main contributor for the nation and its economy as well. From the expert opinion, it has been observed that this growth has spread over the country because of shipbuilding, for project setup and the real estate segment. The steel industry at this time going through increasing demand in Bangladesh. Fortunately, the country has a proud heritage for the art of steel making and shaping for a long time. Currently, more than 400 steel, re-rolling and auto-re-rolling mills are in Bangladesh (Light castle Analytics Wing, 2016)

"Bangladesh Steel Re-rolling Mills (BSRM)" is the first steel mill of Bangladesh that established in 1952. By this time a good number of steel companies also emerged in this country like RSSRM, AKS, KSRM, GPH Ispat, Rahim Steel, etc. (Wikipedia-Bangladesh Steel Industry, 2019). For distributing these industries product to the customer, dealer plays a big role. Dealers usually provide the services and sell the respective products to the customers directly and for the steel industry, it stays as most common (Inc., 2018). The producers can gain the feedback of the customers through the dealers as they deal with customers directly. Thus, this research paper will help to measure the performance of service supply chain management of the Steel Industry mainly for BSRM on dealers' perspective.

### **LITERATURE REVIEW**

Service SCM is not like SCM. According to Ellram, Tate, and Billington (2004) SSCM as: "the management of information, processes, capacity, service performance and funds from the earliest supplier to the ultimate customer." SCM also related to a large public sector that providing services to the peoples through hospitals, societal services and the attention given to the elderly. Manufactured oriented product is quite differences with services. Services has some characteristics that it cannot be seen or touch but anyone can feel it, it is heterogeneous, cannot be stored or preserved or saved and simultaneous consumption and production while providing the services with some dimension quality which is difficult to assess (Akkermans and Vos, 2003; Haksever, Render, Russell, & Murdick, 2000). Regardless of the evolution of the service areas from the last fifty years heading with its position, exploration in this sector has a wide range of expansion in different academic fields (Chesbrough and Spohrer, 2006). The SSCM is an extensive thought that covers trade with some dealing like the supply of equipment or parts, materials providers by the third party, finance, merchandising and organizational services. SSCM has a wide scope to research and a vast literature has been found in the field of health service area (Fernie, John, and Rees, 1995), purchasing performs in metropolises (De Boer and Telgen, 1998), elaboration of the thought related with factory based services (Youngdahl and Loomba, 2000), duality of customer-supplier in service-oriented businesses (Sampson, 2000), frameworks of SSCM (Ellram

et al., 2004; Johnson and Glark, 2008), comparisons in between manufacturing and SSCM with the performance (Sengupta, Heiser, & Koll, 2006), SSCM and the e-government procedures (Michaelides and Kehoe, 2006) and further research in community procurement (Knight, Harland, Telgen, Thai, Callendar, & Mc Hen, 2007).

Neely, Adams, & Kennerley (2002) state performance measurement that it is the process of enumerating the efficiency of its past actions and the effectiveness as well. Effectiveness means the level of customers' requirements that have been fulfilled and on the other hand, efficiency is to gain customer satisfaction by proper utilization of the resources of a firm with low costs. Lee & Billington (1992) stated the distinct sites in SCM that it cannot do maximum efficiency in case of pursue each goal independently. SCM is a tool that pursues constant improvement by various companies in a competitive marketplace. But from some literature, it has been found that the total profit by coordination and incorporation between the channel members is very rare. The main reason for this failure is not to develop performance measurement techniques and metrics that required for the integration of its supply chain that will help to maximize its efficiency levels and effectiveness (Gunasekaran, Patel, & Mc Gaughey, 2004). So, measurements need to be shared and used by entire supply chain channel members. Thus, more models and studies that related to performance measurement should have to be enhanced to achieve organizational goal.

Gunasekaran, Patel, & Tirtiroglu (2001) proposed a framework to assess the performance of a manufactured oriented supply chain and the metrics have been classified into three-level, first one is strategic, the second one is tactical and last one is operational. To make the fair decision, these levels are assigned with its best management levels. The metrics also classified one as a financial and another one as nonfinancial, to do preferable costing method built on activities analysis may be applied. The depiction of metrics will give a strong representation of each metric that should be applied for the assessment of performance, its usedness, and to whom it should be responsible. Based on Gunasekaran's classified dimensions to measures performance are further developed by Cho, Lee, Ahn, and Hwang (2012). They categorize by the criteria of three different

## Performance Measurement of Service Supply Chain Management of Steel Industry on Dealers' Perspective – The Case of Bangladesh

assessment areas to measure the performance of SSCM as service supply chain operations, then customer service and then lastly corporate management (Table 1). Each assessment also

has been divided into sub-criteria. Based on these criteria and all sub-criteria the level of Service Supply Chain has been measured in this paper.

**Table 1.** Metrics and metrics dimensions for service supply chain performance evaluation Developed by Cho et al., (2012)

Assessment areas	Criteria	Definition	Performance metrics
<b>Service supply chain operation</b>	Responsiveness	Willingness to help customers and provide prompt service	Service delivery Customer query time
	Flexibility	The ability of the service process to adapt to change	Flexibility(volume, delivery speed, specification) Quality of service Employee loyalty Supplier risk sharing initiatives
	Reliability	Ability to perform the promised service dependably and accurately	Buyer–supplier partnership level Quality of supplier’s service level The service order entry method The customer service order path Accuracy of forecasting techniques Supporting service delivery lead time Service order Lead time
<b>Customer service</b>	Tangibles	Physical facilities, equipment, and appearance of personnel	Range of services Service capacity
	Assurance	Knowledge and courtesy of personnel and their ability to inspire trust and confidence	Customer satisfaction Customer retention/loyalty
	Empathy	Caring, individualized attention the firm provides its customer	Customer relationship
<b>Corporate management</b>	Profitability	The value of a customer	Average customer spends per visit per store
	Cost	The costs associated with operating the supply chain	Total service delivery cost Supplier pricing against market Supplier cost saving initiatives
	Asset	The management of all assets: fixed and working capital	Rate of return on investment Total cash flow time
	Resource utilization	Utilization of resource in the delivery of services	Capacity utilization Total cycle time Productivity Effectiveness of scheduling techniques Operating ratio of actual to planned working hours

### OBJECTIVES

Though it is believed that service-oriented firms get the advantages by doing some preeminent practices form manufacture oriented industry but manufacturing industries may also get the benefit by practicing a particular SCCM. So,

researches on this purpose get the highest priority and it became mandatory to measure the service supply chain processes. The main objectives of this paper are to measure the performance of service supply chain management of the Steel Industry basically for BSRM on dealers' perspective. In supporting the

## Performance Measurement of Service Supply Chain Management of Steel Industry on Dealers' Perspective – The Case of Bangladesh

other objectives are to identify the dealers' first choice among steel companies in Bangladesh and to compare their choice against their business experiences.

### METHODOLOGY

#### Research Design

This paper is all about the perception of dealers regarding steel companies in Bangladesh, so it is quantitative research in nature. To analyze the data “Statistical Package for Social Sciences” (SPSS) has been used to do descriptive analysis, frequency tables, and cross-tabulation.

#### Data Collection Method

The questionnaire survey has been performed to gain insight into dealers' perceptions of steel companies. Data has been collected from June to September 2019 and the graduates from marketing major students have been assigned to collect the data.

#### Survey Questionnaire Design

As services are intangible it cannot be touched and difficult to measure or compare. To overcome the issue, Cho et al., (2012) set the measurement of performance. To check the validity of the questionnaire a panel of 5 experts has been asked where two are professors and rests of them are academicians and researchers. According to their guidelines and suggestions questionnaire has been modified. In this survey respondents are asking to give their consent for every statement on a five-point Likert scale (from strongly agree-5 to strongly disagree-1).

#### Population & Sample Selection

The population designed for this study was limited to the dealers of Chattogram city only. The sample was comprised of 42 respondents spread across the different locations in Chattogram city. To conduct this research, we had chosen BSRM as a sample for the survey of dealers' perception regarding the measurement of service supply chain management. The selection of the respondents was a range from A grade dealers. Simple random samplings were used to get a fairly accurate cross-section of the population and to ensure the purity of research results.

### ANALYSIS

#### Reliability Analysis

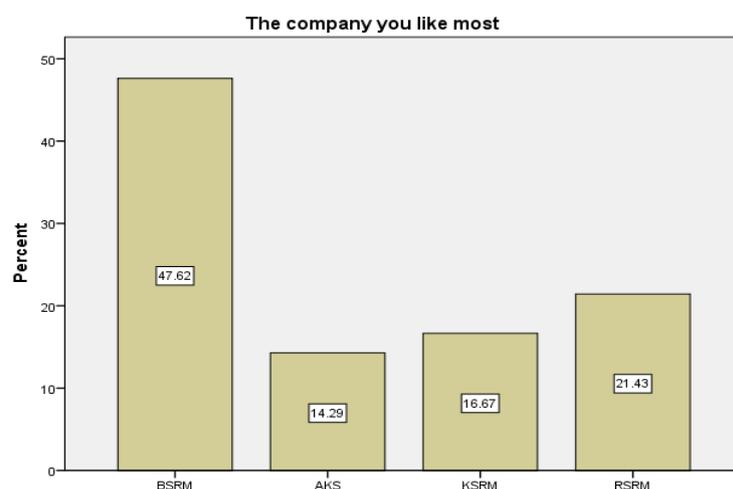
The reliability of the scale measurement is assessed by Cronbach's Alpha. According to Hair, Black, Babin & Anderson (2009) if the value of Cronbach's Alpha is equal or more than 0.70 then it is assumed that the items of the scale are highly reliable. In this study, the Alpha value is 0.946, which indicates that all the items in the questionnaire are reliable and internal consistency is justified.

**Table 2.** Reliability analysis

Reliability Statistics	
Cronbach's Alpha	N of Items
.946	22

#### Descriptive Analysis

From figure 1, we see that dealers' first choice is BSRM, then RSRM, KSRM, and AKS in steel companies at Chattogram city. It indicates that BSRM is able to fulfill the expectations and provide the expected services to the dealers than from other steel companies.



**Figure 1.** Most likable companies

**Cross Tabulation: Year of Experience Vs Company Choice**

It has been seen from table 3 that in every aspect BSRM has achieved the leading position. It has also been observed that the greater number of experiences gathered by the dealers the most preference has been growing with the company BSRM (59.1%). The second leading company is

almost the same in-between RSRM and KSRM. But it is interesting to see that KSRM is not the choice able company for the beginners that means for the new dealers' experience with 0-5 years. It has also been observed that AKS has a downward trend on dealers' choice while they got more experiences.

**Table3.** Year of experience vs company choice

Year of experiences * The company you like most Cross tabulation							
			The company you like most				Total
			BSRM	AKS	KSRM	RSRM	
Year of experiences	0-5 Years	Count	2	1	0	1	4
		% within Year of experiences	50.0%	25.0%	0.0%	25.0%	100.0%
		% within The company you like most	9.5%	20.0%	0.0%	11.1%	9.5%
	6-10 Years	Count	2	1	2	1	6
		% within Year of experiences	33.3%	16.7%	33.3%	16.7%	100.0%
		% within The company you like most	9.5%	20.0%	28.6%	11.1%	14.3%
	11-15 Years	Count	4	1	2	3	10
		% within Year of experiences	40.0%	10.0%	20.0%	30.0%	100.0%
		% within The company you like most	19.0%	20.0%	28.6%	33.3%	23.8%
	More than 15 Years	Count	13	2	3	4	22
		% within Year of experiences	59.1%	9.1%	13.6%	18.2%	100.0%
		% within The company you like most	61.9%	40.0%	42.9%	44.4%	52.4%
Total	Count	21	5	7	9	42	
	% within Year of experiences	50.0%	11.9%	16.7%	21.4%	100.0%	
	% within The company you like most	100.0%	100.0%	100.0%	100.0%	100.0%	

**Dealers 'Perception Regarding Service Supply Chain Management**

According to Cho et al., (2012) service supply chain management is measured by service supply chain operation, customer service, and corporate efficiency. From table 4 we see that dealers are quite satisfied with the service supply chain operation of BSRM. Compare to the reliability, dealers are very much satisfied

with the responsiveness and flexibility. In the reliability section, they are in a neutral position (mean value-2.64) in case of supporting service delivery lead time. Delivery lead time is the time required to deliver the product after getting an order. So, it indicates that BSRM sometimes takes more time to deliver the product after receipt of the order.

**Table4.** Dealers' perception on service supply chain operation

Service supply chain operation	N	Minimum	Maximum	Mean
<b>Responsiveness:</b> Willingness to help customers	42	2	5	4.10
Provide prompt service	42	2	5	3.93
Service delivery on customer query time	42	2	5	3.62
<b>Flexibility:</b> The ability of the service process to adapt to change	42	2	5	3.76
Provide support on supplier risk sharing initiatives	42	2	5	3.60
<b>Reliability:</b> Buyer-supplier partnership level is quite satisfying	42	1	5	3.02
Supporting service delivery lead time is satisfactory	42	1	5	2.64
Satisfy with service order lead time	42	2	5	4.24
Satisfy with the promised service of the Company	42	2	5	4.19
Valid N (list wise)	42			

It has been seen from table 5 that BSRM is quite good to deliver satisfaction to the dealers through customer service. In all cases of tangibility, assurance and empathy dealers are satisfied with BSRM.

**Table5.** Dealers' perception on customer service

Customer Service	N	Minimum	Maximum	Mean
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## Performance Measurement of Service Supply Chain Management of Steel Industry on Dealers' Perspective – The Case of Bangladesh

<b>Tangibles:</b> Steel Leaders Using the modern looking equipment in time of providing the services	42	2	5	4.12
Employees of the company appear neat and clean while dealing with the dealers	42	1	5	3.86
<b>Assurance:</b> When you have a problem, Company Shows the best interest to solve it	42	1	5	3.24
Feel Safe to make transaction with Company	42	2	5	3.62
<b>Empathy:</b> Company gives you individual attention	42	1	5	3.52
Company Provides the services based on customer needs and wants	42	1	5	3.62
Valid N (listwise)	42			

In the portion of corporate efficiency, we see that dealers are satisfied with BSRM. They are satisfied with the profitability and the cost associated with service delivery and the

companies price against the market. In resource utilization they are not satisfied (mean=2.83) with the utilization of resources while getting the delivery of services.

**Table6.** Dealers' perception on corporate efficiency

Corporate Efficiency	N	Minimum	Maximum	Mean
<b>Profitability:</b> Average customers of the company spend more per visit	42	1	5	3.31
<b>Cost:</b> Service delivery costs is satisfactory	42	2	5	3.76
Companies pricing against market is satisfactory	42	2	5	3.57
<b>Resource utilization:</b> Satisfied with utilization of resource in the delivery of service	42	1	5	2.83
Effectiveness of scheduling techniques	42	2	5	3.83
Valid N (listwise)	42			

Thus, from tables 4, 5 and 6 we see that dealers are quite satisfied with the performance of BSRM in service supply chain management.

### CONCLUSION

It has been shown that different approaches to SCM lead to measure the performance. The research on this issue is very crucial for the academicians and also for the practitioners. This research paper has been highlighted to measure the performance of the service supply chain of steel industry of Bangladesh. Because of expansion of globalization and technological improvements the steel manufacturing company is now in high growth trend. To cope up with the challenges, execution of effective SSCM performance measurement is necessary. The identification and analysis of this paper are based on some specific metrics and many more different performance metrics should be combined to get the best output. Depth and versatile information on this issue can be beneficial for different manufacturing industry by applying SSCM performance measurement techniques in this growing global market.

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**Citation:** Mohammad Toufiqur Rahman "Performance Measurement of Service Supply Chain Management of Steel Industry on Dealers' Perspective – The Case of Bangladesh". (2020). *International Journal of Research in Humanities and Social Studies*, 7(1), pp.9-15

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