

Impact of Supply Chain Management Practices on Performance of Companies

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ABSTRACT

This research paper studies the effect of supply chain management (SCM) practices on the performance of companies in terms of supply chain efficiency and supply chain effectiveness. To achieve this, the study also encompasses companies that have drastically improved their internal operations, and now they find it necessary to consider relations with external customers and suppliers in the supply chain to gain further improvements in their operations. Data for this research were collected from 75 respondents of manufacturing companies. The results indicate that three variables of supply chain practices, viz. management practices (MP), customer relationship management and logistics process, are significantly and positively related to output performance. SCM is an application of systems and provides a basis for understanding processes that cut across a company's internal departments and processes that extend outside the company as well. In this study, out of these three supply chain practices, logistics process is significantly superior as compared to MPs and customer relationship management in bringing about performance improvement. Further, the study also indicates that there is a significant difference in the impact of the three supply chain practices according to the nature of the product and size of the company.

Keywords: Supply Chain Process, Supply Chain Management, Management Practices, Customer Relationship Management, Logistics Process, Output Performance

INTRODUCTION

Supply chain management (SCM) has become an essential field of research. Many researchers are engaged in the study of effective supply chain practices on various aspects of a company's output performance (OP), and to investigate their impact on operational, organisational and supply chain aspects. However, currently, SCM research is mainly focused on companies in developed countries. Companies in developing countries face a real challenge to improve their operational capabilities, including SCM, to be able to compete and survive in a globally competitive environment. SCM is the extended range of activities required to plan, control and execute the flow of products, from acquiring raw materials and production through distribution to the final customer. Competition has dramatically increased in the last two decades. The current business environment is characterised by factors such as globalisation, free trade agreements and open markets. To shed more light on the relationship between SCM practices and supply chain performance, we include competitive intensity as a moderating variable to investigate its effect on this relationship. The competitive situation in India is similar to many other countries. Before globalisation, the manufacturing sector in India had no competition with

foreign manufacturers. A supply chain can be defined as resources, activities and technologies involved in the manufacture and sale of product or service and connected network of individuals. The initial step of supply chain practices starts with obtaining delivery from the raw material suppliers. Later part is to deliver finished goods from the manufacturing unit to consumers. Effective SCM has become a potentially valuable way of securing competitive advantage and improving organisational performance since competition is no longer between organisations but among supply chains. This research conceptualises and develops dimensions of SCM practice. Organisations are aware that there must be an effect of supply chain practices within the organisation and also outside the organisation. The understanding and practising of SCM has become an essential prerequisite for staying competitive in the global race and enhancing profitability.

LITERATURE REVIEW

Supply Chain Practices

Stock and Boyer (2009) defined SCM as 'the management of a network of relationships within a firm and between interdependent organizations and business units consisting

of material suppliers, purchasing, production facilities, logistics, marketing, and related systems that facilitate the forward and reverse flow of materials, services, finances and information from the original producer to final customer with the benefits of adding value, maximizing profitability through efficiencies, and achieving customer satisfaction’.

Researchers have pointed to several objectives and goals of SCM.

Williams (2006) stated that organisations can improve profit and market share by improving the effectiveness of supply chain partners. Productivity may be increased by short-term objectives, but that will increase the frequency of cycle time and inventories.

Cook and Heiser (2011) defined that the SCM consists of many components such as information sharing, long-range relationships, advanced planning techniques, leveraging the internet, and supply and distribution network structures. The findings of their research indicate that there is a positive effect of SCM practices on organisational performance.

Engelseth and Felzensztein (2012) explored that responsiveness in a supply network may be integrated from combined relationship marketing (RM) and SCM. They suggested developing responsiveness to technically generate value through the supply network by-product transformations and to know what the end-user perceives as value. As they define, SCM is useful to generate value through technical product-transforming processes and RM helps customers perceive value in the context of business relationships. They propose intertwining SCM and RM competencies to achieve responsive product supply from both end-user and multi-tier supply network perspectives. They suggest this approach as useful in both strategic planning of a company’s role in a wider supply chain setting and planning of cross-functional teamwork in operations.

Daghfous and Barkhi’s (2009) research is related to the implementation of SCM practices in UAE hotels. Their research states that before competing on knowledge, there must be adequate Information and Communication Technology (ICT) infrastructure to support the implementation of best practices. They suggested more systematic planning and learning from other industries, such as the manufacturing and retail industries.

The application of the integrative approach to the supplier and buyer exchange differentiated products and beneficiaries from knowledge spillovers (possibly impulse by R&D subsidies). The main result is that the effect

of a subsidy to vertical R&D depends on the relative innovative capacities of the supplier or buyer (Kumar & Raman, 2015).

It could assume that the reverse supply chain is considered as obligations from governments and burdens on organisations. However, recycling can be beneficial in many ways. It reduces the cost of raw materials by reusing the components from returned products (Abdulkader, 2015).

The abilities driven by consolidated SCM are reaping advantages amidst a series of businesses as different as structure and software expansion. These benefits are very influential even than stock lessening and more powerful than logistics, encircling new product idea, better cycle time, better in customer receptiveness, and overall superior productivity (Mehta, 2016).

A comprehensive research on Theory of Constraints (TOC) in systems highlights two main barriers in implementation: due to lack of management support and due to lack of interest of all stakeholders in TOC and there is a limitation in terms of the high opportunity cost and difficulties in technology adoption (Singh & Misra, 2018).

The proper inventory planning and its effective management are of chief importance for the benefit of the business and markets. Portraying some of the reimbursements having an apt inventory is appropriate to balance of demand and supply, successful market treatment, adequate market ranking, product positioning in the minds of the customers and many others (Chalotra, 2018).

RESEARCH METHODOLOGY

This research is based on primary data. Information is collected through a structured questionnaire. The ‘convenience’ sampling method is used for the collection of primary data. Information from respondents is collected through a structured questionnaire. The questionnaire was consisting of information related to the profile of the company, SCM practices and performance of the company. In this study, three independent variables are considered. These three variables are:

- Management Practices (MP)
- Customer Relationship Management (CRM)
- Logistics Practices (LP)

The only dependent variable of the study is ‘Output Performance (OP)’.

For the analysis of primary data, statistical methods such as arithmetic mean, standard deviation and percentage are used. For the testing of hypothesis, ANOVA followed by F-test, T-test and correlation is used. Regression is used to decide the predictive model.

OBJECTIVES OF THE STUDY

- To study various practices of SCM in the manufacturing industry.
- To study the extent of SCM practices according to the profile of the company.
- To study the impact of practices of SCM on the performance of the company.

HYPOTHESES OF THE STUDY

H_{01} : There is no significant difference in practices of SCM.

H_{11} : There is a significant difference in practices of SCM.

H_{02} : There is no significant difference in the practices of SCM according to the profile of the company.

H_{12} : There is a significant difference in practices of SCM according to the profile of the company.

H_{03} : There is no effect of SCM practices on the performance of the company.

H_{13} : There is an effect of SCM practices on the performance of the company.

DATA ANALYSIS

Information on company profiles is classified and presented in the following table.

There are a total of 75 respondents. The classification of these respondents according to the company profile is as follows.

Table 1

		Number of Respondents	Percent
Nature of Company	Chemicals	40	53.3
	Plastics	35	46.7
Size of company	Small	34	45.3
	Medium	41	54.7
Ownership of company	Proprietorship	20	26.7
	Partnership	27	36.0
	Private Limited	28	37.3
Year of establishment	2000 or before	33	44.0
	After 2000	42	56.0

The Table 1 indicates that there are 40 (53.3%) respondents belonging to chemicals manufacturing companies and the remaining 35 (46.7%) respondents belonging to plastic products manufacturing companies. There are 34 (45.3%) small-size companies and 41 (54.7%) medium-size companies. Further, it is observed that there are 20 (26.7%) respondents belonging to proprietorship firms, and there are 27 (36.0%) respondents belonging to partnership firm and remaining 28 (37.3%) respondents belonging to private limited companies.

According to the year of establishment of the company,

33 (44.0%) respondents belong to companies established in the year 2000 or before, and 42 (56.0%) respondents belong to companies established after the year 2000.

STUDY OF VARIABLES

For the study of variables, the Likert scale is used. To check the reliability of the scale, Cronbach Alpha test is applied. Results indicate that for 75 respondents and 30 questions, the Cronbach Alpha value is 0.721. It is greater than 0.70. Therefore, the test is accepted, and the conclusion is that the scale is reliable.

Table 2: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Management Practices (MP)	75	58.00	94.00	74.30	7.87
Customer Relationship Management (CRM)	75	62.50	100.00	77.33	6.89
Logistic Process (LP)	75	60.00	96.00	76.45	9.0
Output Performance (OP)	75	40.00	97.14	64.99	10.44

The above results indicate that the mean value of management practices (MP) is followed 74.30 percent. It is the lowest among the three supply chain practices. For customer relationship management (CRM) mean score is 77.33 percent which is best among the three. The mean

score value for the logistics process is 76.45 percent. The mean value of OP is 64.99 percent. This information is obtained for testing of the following hypothesis. This information is presented using a bar diagram, as shown below.

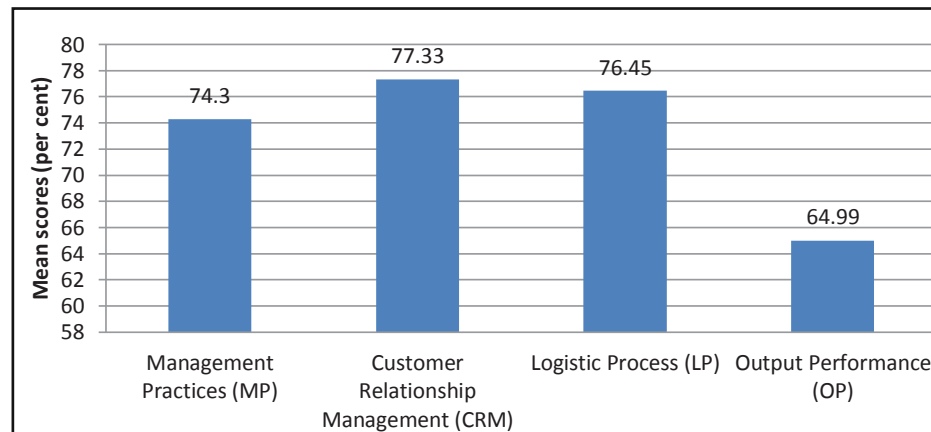


Fig. 1: Mean Scores of Variables

H_{01} : There is no significant difference in the practices of SCM.

To test the above null hypothesis, paired T-test is applied for each of the two supply chain practices. The results are as follows:

H_{11} : There is a significant difference in practices of SCM.

Table 3: Paired Samples Test

		Paired Differences		t	df	Sig. (2-tailed)
		Mean	Std. Deviation			
Pair 1	Management Practices and Customer Relationship Management.	-3.02667	9.42821	-2.780	74	0.007
Pair 2	Management Practices and Logistics Process.	-2.14667	10.53269	-1.765	74	0.082
Pair 3	Customer Relationship Management and Logistics Process.	.88000	8.68746	0.877	74	0.383

The above results indicate that there is a significant difference in the mean value of management and customer relationship management. CRM (77.33%) is significantly better as compared to MP (74.30%). There is no significant difference between MP and LP. Further, there is no significant difference in CRM and LP.

H_{02A} : There is no significant difference in practices of SCM according to the product of the company.

H_{12A} : There is a significant difference in practices of SCM according to the product of the company.

To test the above null hypothesis, ANOVA is obtained and F-test is applied. To check MPs between chemicals and plastics industry, p-value of F-test is 0.002. It is less than 0.05. Therefore, the test is rejected and the conclusion

is that there is a significant difference in MP. The mean score of MP for plastics industries is 77.31 percent and for chemical industries it is 71.67 percent.

For CRM between chemicals and plastics companies, the p-value of F-test is 0.001. This indicates that there is a significant difference in the CRM of chemicals and plastics companies. The mean score of CRM for plastics companies is 80.10 percent, and for chemicals companies, it is 74.91 percent.

The study of LP indicates the p-value of the F-test is 0.003. This indicates there is a significant difference in LP of chemicals and plastics companies. Mean score of LP for plastic companies is 79.68 percent and for chemicals companies, it is 73.62 percent.

Regarding OP, p-value of the F-test is 0.000. This indicates there is a significant difference in OP of chemical and plastic companies. Mean score of OP for plastic companies is 70.93 percent and for chemical companies is 59.78 percent.

H_{02B}: There is no significant difference in practices of SCM according to the size of the company.

H_{12B}: There is a significant difference in practices of SCM according to the size of the company.

To test the above null hypothesis, ANOVA is obtained and F-test is applied. To check MPs between small and medium-size companies, the p-value of F-test is 0.002. It is less than 0.05. Therefore, F-test is rejected. The conclusion is that there is a significant difference in MP of small and medium-size companies. The mean score of MP of small-size companies is 77.38 percent, and for medium-size companies, it is 71.75 percent.

To study CRM between small and medium-size companies, p-value of the F-test is 0.072. It is greater than 0.05. Therefore, F-test is accepted. The conclusion is that there is no significant difference in CRM of small and medium-size companies. The mean score of CRM of

small-size companies is 77.64 percent, and for medium-size companies, it is 77.07 percent.

To study the logistics process (LP) between small and medium-size companies, p-value of the F-test is 0.451. It is greater than 0.05. Therefore, F-test is accepted. The conclusion is there is no significant difference in LP of small and medium-size companies. The mean score of LP of small-size companies is 77.32 percent and for medium-size companies, it is 75.73 percent.

To study OP between small and medium-size companies, p-value of F-test is 0.027. It is less than 0.05. Therefore, F-test is rejected. The conclusion is that there is a significant difference in OP of small and medium-size companies. The mean score of OP of small-size companies is 67.89 percent and for medium-size companies, it is 62.57 percent.

H₀₃: There is no impact of SCM practices on the performance of the company.

H₁₃: There is an impact of SCM practices on the performance of the company.

To study this null hypothesis, Karl Pearson's Correlation test is applied. In this test, relation between OP and three supply chain practices is tested. Results are as follows:

Table 4: Correlations

		Output Performance	Management Practices	Customer Relationship Management	Logistic Process
Output Performance	Pearson Correlation	1	0.403**	0.336**	0.284*
	Sig. (2-tailed)		0.000	0.003	0.014
	N	75	75	75	75

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

The correlation value between OP and MP is 0.403. This indicates OP is significantly and positively related to MPs.

The correlation value between OP and CRM is 0.336. This indicates that there is a significant positive relation between OP and CRM.

The correlation value between OP and LP is 0.284. This indicates that there is a significant positive relation between OP and LP.

Since there is a significant positive correlation, a linear regression model is applied.

OP is dependent variable and MP, CRM, LP are three independent variables.

Table 5: Coefficients^a

Model	B	Unstandardised Coefficients		Standardised Coefficients	T	Sig.
		Std. Error	Beta			
1	(Constant)	-4.196	14.884		-0.282	0.779
	Management Practices	0.445	0.142	0.335	3.144	0.002
	Customer Relationship Management	0.340	0.174	0.225	1.953	0.055
	Logistic Process	0.128	0.134	0.111	0.955	0.343

a. Dependent Variable: Output Performance

The above results indicate that the coefficient value of linear regression is -0.4196. The coefficient value for MP is 0.445. It has a significant impact on OP. The coefficient value for CRM is 0.340. It has no significant impact on OP. The coefficient value for LP is 0.128. It has no significant impact on OP.

The model of linear regression is expressed as follows:

$$OP = 0.445*MP + 0.340*CRM + 0.128*LP - 0.4196$$

This model is useful to predict the OP of a company.

CONCLUSION

This research paper concludes that out of three supply chain practices, CRM is best followed among the three. While comparing the three supply chain practices, it is observed that for plastic companies practices are better as compare to chemical companies. All three, viz., MP, CRM and LP, are better applied in plastic companies as compared to chemical companies. Management practices in small-size companies are better as compared to medium-size companies. CRM and LP are similar in small as well as medium-size companies. Regarding correlation, OP has a significant impact from MP, CRM and LP practice. OP has a significant positive correlation with all three supply chain practices.

Normally, plastic products are voluminous in nature; hence, the easy access of these products to the customers would ensure the effectiveness of the transportation cost. Getting these capacious products closer to the end-user would confirm cost effectiveness in the competitive business environment. There is a restriction on information sharing in the chemical industries to maintain the secrecy of the manufacturing process/technology and on account of the presence of the monopolised products and underlying patent rights. On the other hand, plastic products are in the process of substituting glass, aluminium and paper products. This process of substitution leads to

an enormous amount of technological changes, resulting in the healthy sharing of information. Thus, plastic products would support cost effectiveness and productive information sharing, thus benefitting the competitive business environment at large.

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QUESTIONNAIRE

Name of Company:.....

Name of Respondent:.....

Nature of Business: (1) Chemical (2) Plastic

Size of Company: (1) Small (2) Medium

Ownership of Company: (1) Proprietorship (2) Partnership (3) Private Limited

Year of Establishment:

The following questions are about how your organisation has been implementing supply chain management practices. In general, kindly identify your opinion on the following. Please put a TICK mark at the appropriate column.

Supply Chain Management Practices

Code	Supply Chain Management Practices	Strongly Disagree	Disagree	Neither Disagree Nor Agree	Agree	Strongly Agree
MP-1	Your organisation rely on a few dependable suppliers					
MP-2	Your organisation rely on a few high quality suppliers					
MP-3	Your organisation consider quality as number one criterion in selecting suppliers					
MP-4	Your organisation strive to establish long-term relationship with its suppliers					
MP-5	Your organisation helps its suppliers to improve their product quality					
MP-6	Your organisation has continuous improvement programs that include its key suppliers					
MP-7	Your organisation include its key suppliers in its planning and goal setting activities					
MP-8	Your organisation actively involves its key suppliers in new product development processes					
MP-9	Your organisation certifies its suppliers for quality					
MP-10	Your organisation regularly solves problems jointly with its suppliers					

Customer Relationship Management (CRM)

Code	Customer Relationship Management	Strongly Disagree	Disagree	Neither Disagree Nor Agree	Agree	Strongly Agree
CRM-1	Your organisation shares a sense of fair play with its customers					
CRM-2	Your organisation frequently interacts with customers to set its reliability, responsiveness and other standards					
CRM-3	Your organisation has frequent follow-up with its customers for quality/service feedback					
CRM-4	Your organisation frequently measures and evaluates customer satisfaction					
CRM-5	Your organisation frequently determine future customer expectations					
CRM-6	Your organisation facilitates customers' ability to seek assistance from it					
CRM-7	Your organisation frequently evaluates the formal and informal complaints of its customers					
CRM-8	Your organisation periodically evaluates the importance of its relationship with its customers					

Logistics Process (LP)

Code	Logistics Process	Strongly Disagree	Disagree	Neither Disagree Nor Agree	Agree	Strongly Agree
LP-1	Your organisation strives to reduce time wastage in operations					
LP-2	Your organisation has continuous quality improvement program					
LP-3	Your organisation produces only what has been ordered by customers (pull production system)					
LP-4	Your organisation pushes suppliers for shorter lead times					
LP-5	Your organisation streamlines ordering, receiving and other paper work from its suppliers					

Output Performance (OP)

Code	Output Performance	Not Satisfactory	Little Satisfactory	Satisfactory	Mostly Satisfactory	Completely Satisfactory
OP-1	Sales					
OP-2	Order fill rate					
OP-3	On time deliveries					
OP-4	Customer response time					
OP-5	Shipping errors					
OP-6	Manufacturing lead time					
OP-7	Attending customer complaints and suggestions					