
STUDY OF IMPACT OF SUPPLY CHAIN PROCESS ON PERFORMANCE OF SMALL AND MEDIUM SCALE COMPANIES

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***Abstract:** The majority of logistics researches are primarily based on quantitative research viewed through a positivist perception. Increasingly, there are calls for logistics research to more frequently employ qualitative methodologies. The trend in management research generally is increasingly to use methods and approaches which provide a middle ground between the contrasting positivist and phenomenological paradigms and perspectives. Methodological triangulation, using quantitative and qualitative methodologies, increasingly provides multidimensional insights into many management research problems. This paper urges logistics researchers to think about impact of logistic process and supply chain integration. If the ultimate aim is to gain knowledge about the world then one needs to do this in the most valid way possible. This paper describes the dominant research perspectives towards flexibility performance and Output performance of logistic process.*

However, the paper is not a pure criticism of the use of quantitative research methods in general or in logistics in specific. Rather, the argument is that it is necessary to use both quantitative and qualitative methods if we really want to develop and advance logistics research. Logistics problems are often ill-structured, even messy, real-world problems. Modern logistics is based on holistic and systemic thinking and uses multi-disciplinary and cross-functional approaches. Thus action research case studies are especially suited for an applied field such as logistics since they strive to advance both science and practice.

***Keywords:** Logistics, Logistic Process, Supply Chain, Flexibility Performance, Output Performance.*

INTRODUCTION

As distances between production facilities and pressures for fast delivery increase, the coordination of these dispersed manufacturing resources becomes a critical activity. Nowadays firms face a complex, continuously changing and uncertain environment through trends and changes in the area of globalization, technological changes and innovations and changes in the customer's needs and expectations. To cope with this increasingly uncertain and quickly changing environment firms strive for flexibility.

An overview of the flexibility theory is presented, describing the elements of flexibility, the perspectives on flexibility, the dimensions of flexibility, the different aspects of flexibility and the comparison of flexibility. The delivery time of order has become an important fact for customers to evaluate logistics services. Due to the diverse and large quantities of orders in the background of electronic commerce, how to improve the flexibility of distribution hub and reduce the waiting time of customers becomes one of the most challenging questions for logistics companies.

The purpose of this paper is to analyse papers studying the link between supply chain integration (SCI) and performance, and to discuss reported empirical evidence relating to this fundamental question for logistics and supply chain management. This research is a humble scientific attempt to shed more on the challenges and the obstacles that those companies faced during their success journey stand behind finding integration in their supply chain. By reviewing the available literature about the supply chain integration challenges we didn't find a single source able to present all these challenges that may face the organization during its implementation of supply chain integration.

LITERATURE REVIEW

Hussain A.H Awad, Mohammad Othman Nassar (2010) has discussed in this paper about supply chain integration challenges; this necessitated an exploration of the nature of the SC network, the benefits of SC integration. At the same time, it was important to explore the challenges and obstacles of SC network integration. All of this was done with the aim of satisfying the primary purpose of the study which was the integration the SC integration

challenges. Through researcher didn't find a relation between the business domain and the kind of challenges. This assumption came as a result of studying the literatures about supply chain integration challenges.

Marianne Jahre (Department of Industrial Management and Logistics, Lund University, Lund) gave some surprising conclusions are drawn. Among the analysed articles very few take LSPs into consideration. The web site analysis shows LSPs varying in their communication. Some do not consider SCI as part of their job, others balance between being pure "resource providers" and taking the riskier role of "supply chain designers". The analysis of the roles LSPs can play in supply chains enriches the understanding of the SCI phenomenon.

Edward Sweeney (Dublin Institute of Technology) published the text book in the name of "Supply Chain Integration: Challenges and Solutions".

Author mentioned in his book that there is significant evidence that the effective implementation of integrated SCM has the potential to generate significant improvements in the performance of firms. The global manufacturers strongly supported the hypothesis that "the companies with the greatest arcs of supplier and customer integration will have the largest rates of performance improvement" This is significant given the centrality of integration in SCM philosophy. This chapter has discussed the role of integration as part of the overall SCM paradigm. However, the adoption of SCI concepts and principles is not without its challenges.

OBJECTIVES OF STUDY

1. To study impact of logistic process (LP) , supply chain integration (SCI) and flexibility practices (FP) on 'output performance (OP)'.
2. To study impact of three variables according to size of company.

Gap Analysis: Performance of supply chain management can be measured by many parameters such as cost efficiency, profitability, resources output etc. This paper is presented considering only flexibility performance and output performance. Gap of study is only two independent variables are considered. These two variables are logistic process (LP) and supply chain

integration (SCI). Other variables are assumed to be constant. Variables not considered in this study are supply chain practices (SCP), customer relationship management (CRM) and information sharing.

Research Methodology: To study objectives primary data is collected. Information is collected through structured questionnaire. Employees having active participation in logistic process and supply chain management are considered as respondents. Information is collected from 80 respondents in all. Stratified random sampling is used to collect the primary data. In this study three independent and one dependent variables are considered. Independent variables are 'Logistic Process (LP)', 'Supply Chain Integration (SCI)', 'Flexibility Practices (FP)'. Only one dependent variables is 'Output Performance (OP)'. For the analysis of data arithmetic mean and standard deviations are obtained. Hypothesis of study are validated using correlation and regression. ANOVA and F-test is also applied.

RESULTS AND DISCUSSIONS

Information is collected from 80 respondents, out of these 39 respondents belongs to small companies and remaining 41 belongs to medium size companies.

Reliability of scale is tested using Cronbach Alpha test. For 80 respondents and in all 32 questions Alpha value is 0.738. It is greater than required value 0.70. Therefore Cronbach Alpha test is satisfied and conclusion is scale is reliable.

Objective-1 To study impact of logistic process (LP), supply chain integration (SCI) and flexibility practices (FP) on output performance (OP). To study strength of relationship Karl Pearson's correlation coefficient is obtained and presented as follows.

Correlations

		OP	LP	SCI	FP
OP	Pearson Correlation	1	.190	.368**	.409**
LP	Pearson Correlation	.190	1	.402**	.304**
SCI	Pearson Correlation	.368**	.402**	1	.571**
FP	Pearson Correlation	.409**	.304**	.571**	1

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

Above table indicate that correlation value between Output performance and logistic practices is 0.190. There is positive correlation but not significant correlation between these two variables.

Correlation between Output Performance and supply chain integration is 0.368. This indicates positive and significant correlation between two variables.

For third pair correlation between output performance and flexibility practices value is 0.409. This is also positive and significant correlation between two variables.

Since all three independent variables have significant impact on output performance. Linear regression is obtained. Results are as follows.

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1659.913	3	553.304	6.133	.001 ^b
	Residual	6856.491	76	90.217		
	Total	8516.404	79			

a. Dependent Variable: OP

b. Predictors: (Constant), SCI, LP, FP

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	38.837	11.040		3.518	.001
	FP	.243	.105	.292	2.320	.023
	LP	.028	.131	.024	.214	.831
	SCI	.207	.142	.192	1.463	.147

a. Dependent Variable: OP

Above table indicate that coefficient for FP is 0.243, for LP is 0 .028, for SCI is 0.207 and constant is 38.837. Out of these three independent variables FP is significant in nature. Therefore linear equation of regression of OP is as follows.

$$OP = 38.837 + 0.243 *(FP) + 0.028 *(LP) + 0.207*(SCI)$$

Above equation can be used to obtain output performance of a company if FP, LP and SCI value are known.

Objective-2: To study impact of three variables according to size of company. For the study of second objective ANOVA is obtained and F-test is applied.

ANOVA

		Sum of Squares	df	Mean Square	F	p-value	Result
LP	Between Groups	841.955	1	841.955	12.019	.001	Rejected
	Within Groups	5463.995	78	70.051			
	Total	6305.950	79				
SCI	Between Groups	479.031	1	479.031	5.495	.022	Rejected
	Within Groups	6799.169	78	87.169			
	Total	7278.200	79				
FP	Between Groups	1765.485	1	1765.485	13.010	.001	Rejected
	Within Groups	10584.715	78	135.701			
	Total	12350.200	79				

For comparative study of supply chain practices (LP) between small and medium companies F-test is applied. Calculated p-value of F-test is 0.001. It is less than standard p-value 0.05 (5% level of significance). This indicates there is significant difference in logistic practices between small and medium companies. Finding is LP for small companies score is 77.94 per cent as compare to 84.43 per cent for medium companies. Conclusion is LP are significantly better in medium size companies.

For the variable information sharing (SCI) p-value of F-test is 0.022. It is less than 0.05. Therefore there is significant difference in SCI of small and medium companies. This indicate SCI is 73.64 per cent for small companies and for medium size companies is 78.53 per cent. Conclusion is supply chain integration is better in medium size companies as compare to small size companies.

Third independent variable is flexibility practices (FP). Calculated p-value for this variable is 0.001. It is less than 0.05. This indicates there is significant difference in FP of small and medium companies. For small companies FP score is 69.33 per cent as compare to 78.73 per cent

for medium size companies. Conclusion is medium size companies flexibility practices is significantly better.

CONCLUSION AND RECOMMENDATIONS

Conclusion of is about relationship of between dependent variable and three independent variables. Dependent variable 'Output Performance' having significant positive correlation with all three variables. It is recommended if performance of three independent variable individually or cumulatively improved then definitely output performance will improve. Present study indicate 'logistic practices' score is 81.27 per cent which is highest among the three independent variables. Score of 'supply chain integration' is 76.14 per cent and for flexibility practices score is 74.15 per cent. It is recommended to improve supply chain integration and flexibility practices can be improved. This will help to improve output performance.

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