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Influence of Supply Chain Management Strategy on Supply Chain Management Performance a Statistical Model Analysis in Context of Indian Automobile Industry

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Abstract: ***During the last decade, Supply Chain Management (SCM) becomes center of immense attention in many organizations. Despite many efforts and the intensive research in the field of SCM, however there is lot of scope on this issue to identify the impact of SCM strategy (SCMS) on SCM performance (SCMP) in Indian automobile manufacturing industry. With this target the current examination in SCM field, is to explore the relationship sandwiched between SCMS on SCMP. Hence, the primary intention is to examine the impact of SCMS on SCMP in the Indian automobile manufacturing industry. The paper investigates associations among SCMS and SCMP and the relations were analyzed through statistical methods, such as reliability and validity tests and multiple regressions. The current research provides strong evidences that SCMS constructs enhancing performances of Indian automobile manufacturing industry. The outcome of the research indicates that Indian automobile manufacturing industry should give emphasis to select proper SCMS ensure that timely adjustment and gain strategic sustainable performance of supply chain network. The findings strongly showed that a SCMS has a significant impact on SCMP.***

Keywords: SCM Strategy (SCMS), SCM Performance (SCMP), Supply Chain Management (SCM), Goods & Service Tax (GST), Supply Chain (SC), Information Technology (IT).

I. INTRODUCTION

In today's cutthroat competitive market, changing government policies, implementation of GST and ban on BS-III vehicles the Indian automobile manufacturing firms can get the competitive advantage with the use of new and innovative SCM practices. The effective and efficient SCM practice emphasizes how to take optimum advantage available resources of the firm. The SC is basically, a linkage mechanism that connects suppliers, manufacturers and the customers. The theory behind SC activity is to add value to input material finally delivered this value added product to the end user (Levi at al, 2004).

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The SC directly or indirectly incorporates each and every member of the network those associated to fulfill the requirement of the customer. The SC includes all the functions concerning from receiving of order to final delivery of the product. Successful implementation of SCM practices is the important aspect to maintain competitive edge over the rivals (Gunasekaran and Ngai, 2004).With the use of IT tools the firms must perform better in term of revisit on asset, revisit on equity and market share (Byrd and Davidson, 2003).The synchronization and incorporation of SC are facilitated by using IT tools, which frankly impacts the monetary performance of the firms (Vickery et al., 2003). In order to get competitive edge and improved performance, firms must put into practice those SCMS that supports the business strategy (Sufian, 2010). According to H.L .Lee, (2002), due to uncertainty in market different SCMS are emerged. The intention of this revise is to discover the impact of constructs SCMS such as innovative SCMS (ISCMS), agile SCMS (ASCMS), and customer oriented SCMS (COSCMS) on constructs of SCMP.

II. LITERATURE REVIEW AND HYPOTHESES

To follow a line of investigation, the primary objective of current research is to investigate the impact of SCMS on SCMP and to determine whether these strategies have some impact on performance. With the above said objectives, there are two concepts emerged. These concepts are (i) SCMS that encompasses ISCMS, ASCNS, and COSCMS (ii)SCMP in terms of SCM cost performance (SCMCP), SCM logistics performance (SCMLP), and SCM customer satisfaction performance (SCMCSP).

Nowadays, in the aggressive business atmosphere, the proper implementation of SCM practices is necessary in order to survive in the competitive market. To contend in such environment, the firms must implement such SCMS which suits the fast-changing competitive environment.These SCMS must incorporate and synchronize throughout the cycle of SC in order to get performance within the partners of SC network (Green Jr.et al, 2008). The firms must adopt suitable SCMS as per need of product and marketplace (Mason-Jones et al.2000). As per the recommendation of Fisher (1997), the development of SCMS considers the nature (functional/innovative) of the product and the demand pattern. In his research Vonderembse et al. (2006) proposing three types of SC for the product, these are innovative, standard, and customize. Every product is unique, and requires distinct strategies as per the need/demand of customer.

Products which are pioneering and require complex technology comes in the category of ISCMS. To responds rapidly as per varying market, the vibrant and supple organizations required ASCMS in order to minimize or even eliminate inventory. For standard product more continuous, dynamic supply chain adjustment required. Products, as per requirement of customer are complex; therefore a deep customer association may be needed and, comes in the category of COSCMS.

Hence, finally on the basis of literature assessment the current research examines that following SCMS constructs; ISCMS, ASCMS and COSCMS and its impact on following SCMP constructs; SCMP, SCMLP and SCNCSP. Hence, the subsequent hypotheses will be hypothesized.

H1: SCMS significantly impacted SCMP.
H1a: ISCMS significantly impacted SCMP.
H1b: ASCMS significantly impacted SCMP
H1c: COSCMS significantly impacted SCMP.

III. RESEARCH METHODOLOGY

3.1 Sampling and Data Collection

In the present study, there are one autonomous variables and a dependent variable. The autonomous variables namely SCMS and the dependent variable is SCMP has been taken. A questionnaire is used as the data collection instrument and the items were measured with 5 points scale (Likert). In statistical testing, an enormous amount of structured data is required from the different respondent who fills the questionnaire1. Hence a large number of respondents should be contacted (Saunders et al., 2007).

3.2. Reliability Analysis

To assess the reliability of each item scale the Cronbach's alpha (α) was conducted. Nunally (1978) recommended α >0.7 point out that item scale can be well thought-out consistent, for each of the item scales factor analysis was used to shrink the items to controllable factor. Principal components analysis extract the factors in which the threshold limit of eigenvalue >1. Case satisfactoriness measurement tests are also examined by the use of the Kaiser-Meyer-Olkin (KMO) information to authenticate use of factor analysis which shows that the KMO value of 0.81 indicates case adequacy. From the analysis three distinct factor for SCMS loading: ISCMS, ASCMS and COSCMS. In these items α-value among 14 items in the questionnaires exceeded 0.7. From the analysis three distinct factors for SCMP: ISCMS, ASCMS, and COSCMS shown in Table 1. These items are treated as autonomous variables.

Table 1:Factor analysis of ISCMS, ASCMS, and COSCMS

Construct	Items	Factor Loading		
ISCMS	The rate of new product advancement/ innovation	0.792		
	Providing high-value service along with the core products	0.76		
	Developing core competencies by new knowledge and research	0.798		
	Using the power of existing knowledge, ability and resources	0.780		
ASCMS	The rate of new product advancement/ innovation		0.732	
	Adopting the latest SCM concepts and tools		0.806	
	Effective planning of long-term MPS and MRP		0.719	
	Close partnership with suppliers with technological support		0.842	
COSCMS	Providing quality products and services			0.863
	Offering modular parts at the competitive price			0.775
	Using the power of existing knowledge, ability and resources			0.864
	Using Standard accessories and parts			0.833
	Using Information technology tools			0.774
	α -Value	0.908	0.875	0.913
	KMO -Value	0.81		

Factor analysis was also applied to the construct of SCMP: these construct are SCMCP, SCMLP and SCMCSP. A total of 13 items were reduced to three underlying factors loadings, depicted in Table 2. Cronbach's alpha s among 13 items in the questionnaires is exceeded the limiting value. These items are treated as dependent variables. The KMO value of 0.80 indicates sampling adequacy

Table 2: Summary for factor analysis of SCMCP, SCMLP, and SCMCSP

Construct	Items	Factor Loading		
SCMCP	Return on Investment (ROI)	0.643		
	ROI growth rate	0.711		
	Market allocate	0.789		
	Share Growth	0.853		
SCMLP	Return on Sales & Sales Growth		0.617	
	Reduced		0.808	
	Reduced		0.771	
	Quicker		0.899	
SCMCSP	Abridged			0.706
	Quicker			0.850
	Value of the			0.791
	Level of			0.861
	Customer			0.893
	α -Value	0.888	0.866	0.903
	KMO value	0.80		

3.3. Correlation Analysis

The correlation between autonomous variable SCMS and a dependent variable SCMP were positive as shown in table 3. ISCMS had an association of 0.577(10 % significance level) with SCMCP is 0.474(10 % significance level) with SCMLP and 0.509(10 % significance level) with SCMCSP, hence it is concluded that ISCMS was moderate impact with all three constructs of SCMCP. Similarly ASCMS has a correlation of 0.739(10 % significance level) with SCMCP, 0.538 (10 % significance level) with SCMLP and 0.512 (10 % significance level) with SCMCSP. This pointed out that respondents are evaluate that ASCMS was encouraging when SCMP encouraging. Finally, COSCMS had a correlation of 0.528(10 % significance level) with SCMCP, 0.416(10% significance level) with SCMLP and 0.512(10 % significance level) with SCMSCP. The respondents are estimate that COSCMS were important criteria for SCMP.

TABLE 3: Correlation Analysis with SCMS and SCMP

		ISCMS	COSCMS	ASCMS	SCMCP	SCMLP	SCMCSP
ISCMS	Pearson Correlation	1.00					
COSCMS	Pearson Correlation	0.974**	1.00				
ASCMS	Pearson Correlation	0.886**	0.853**	1.00			
SCMCP	Pearson Correlation	0.577**	0.528**	0.739**	1.00		
SCMLP	Pearson Correlation	0.474**	0.416**	0.538**	0.842**	1.00	
SCMCSP	Pearson Correlation	0.509**	0.512**	0.611**	0.719**	0.675**	1.00

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

3.4. Regression Analysis

Multivariate regression is a method that appraises a single regression model with more than one result variable. In current research outcome is based on three construct of SCMP:SCMCP,SCMLP and SCMSCP ,hence three model identified in first model dependent variable(DV) is SCMCP ,in second model dependent variable is SCMLP and in third model dependent variable is SCMSCP. The model summary presented Table 4.In Model 1, SCMCP is taken as DV, the model seems to be reliable (p-esteem for F<0.01) with R2 of 0.543. Model 2, SCMLP taken as DV, the model seems to be reliable (p-esteem for F<0.01) with R2 0.453. Model 3, SCMCSP taken as DV, the model seems to be reliable (p-esteem for F<0.01) with R2 of 0.342

TABLE 4: Model Summary(t- Value in parenthesis)

	Model		
	1	2	3
	DV-SCMCP	DV-SCMLP	DV-CMCSP
Constant	117.65 (7.434)**	78.98 (6.786)**	23.66 (5.876)**
ISCMS	0.876 (2.984)**	0.306 (9.886)**	0.675 (6.543)**
ASCMS	0.889 (1.787)	0.309 (12.765)**	0.234 (3.908)**
COSCMS	1.546 (9.637)**	0.344 (3.098)**	0.143 (3.876)**
Adjusted R^2	0.543	0.453	0.342
F-Value	15.876**	8.765**	6.876**

**p value <0.05, **p value <0.01*

IV. RESULTS

In the current research following observation were obtained: The correlation investigation indicate that ISCMS has moderate correlation with SCMCP, SCMSCP and SCMCSP of SCMP dimensions. Similarly, ASCMS has strong correlation with SCMCP and has moderate correlation with SCMLP and SCMCSP. Finally, the COSCMS is a moderate correlation with SCMCP and SCMCSP while it has a weak correlation with SCMLP. The research also found that ISCMS, ASCMS and COSCMS are the important determinant of SCMP. For hypothesis, H1a (SCMS significantly impacted SCMP) examines the association stuck between ISCMS and SCMP. The study found strong evidences that there is a correlation between ISCMS and all constructs of SCMP: SCMCP, SCMLP and SCMCSP. Hypothesis H1b assessed the relationship between ASCMS and SCMP and the analysis showed that ASCMS is not significantly related with SCMCP but having a significant relationship with SCMLP and SCMSCP. Hypothesis H1c assessed the relationship between COSCMS and SCMP and the study shows that COSCMS is significantly related to SCMCP, SCMLP and SCMCSP.

V. DISCUSSION AND IMPLICATIONS

An organization facing big challenges due to the competitive business environment, hence it is important for organizations is to implement the proper SCMS. Research conclusion gives an idea that SCMS is the strong relationship to SCMP.

Although some construct of SCMS is the weak correlation with performance, although, SCMS is important factors and impacting SCMP. However, the top management should be formulated & implemented appropriate SCMS into SCM practices (Sufian, 2010). The study contributes to the field of SCMS and practices in the SCM field. Primary, it projected a hypothetical SCMS framework that identified the ISCMS, ASCMS and COSCMS. Subsequent, this study gives a useful tool for SC managers to review and evaluate the impact of SCMS on SCMP practices. Lastly, provides theoretical and rigid literature on the subject of SCMS and SCMP.

VI. LIMITATION AND FUTURE RESEARCH

Due to the growing demand for high quality and technological innovative product; Indian Automobile manufacturing companies must continuously center of attention on improving their hard work in efficient and effective implementation and quality operations of SCM practices which gives a vision by which the organization focuses on quality product, production and constant improvements in product quality. The results of the study support the fact that how SCMS determinants impacted SCMP and business performance. Due to the technological revolution, rapid innovation and lean production aspects; new and innovative SCMS emerged. On the finishing note from the study it in concluded that implementation of efficient and effective SCMS would eventually result in constructive gains in the performance of any firm.

Note:

1Questionnaire is available with authors.

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