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Interface of Supply Chain & Marketing Activities: A Factor Analysis Approach

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ABSTRACT

Supply chains are not only affected by the entities involved in it but are also affected by the various other functions like the marketing & supply chain functions performed by the organizations. The occurrence of various kinds of marketing functions leads to the variability in the demand of the products at the consumer end which in turns affects the supply chain of the organizations & similarly there are certain supply chain functions which in itself affects the supply of products. So we can conclude that these both functions affect the supply chain of organization.

Keywords: Marketing Functions, Supply Chain Functions, Supply Chain and factor analysis.

INTRODUCTION

Supply chains and supply chain management (SCM) have emerged as increasingly important areas of business practice and academic research. Originally recognized in the 1980s, SCM has engrossed growing interest and attention on the part of both academics and practitioners. Recent conceptions of SCM detail its increasing role within organizations to encompass activities associated with the integration of supply and demand management within and across companies, including coordination and collaboration with channel partners and customers, sourcing, procurement, conversion, and logistics. Importantly, it also include coordination and association with channel partners, which can be suppliers, intermediaries, third-party service providers, and customers. In essence, Supply Chain Management integrates supply and demand management within and across companies. As reflected in their definitions and other conceptual developments, the disciplines of both marketing and SCM have evolved over time. Many manuscript describe conceptual developments in and across the disciplines thereby advancing understanding of the interrelationship of marketing and SCM. Addressing this vital aspect, Esper et al. (2010) introduce a conceptual framework to focus on the creation of customer value through implementation of knowledge management processes between firms they describe how successful integration may be achieved through the shared generation, dissemination, interpretation and application of real-time customer demand together with supply capacity restraints. In both marketing and SCM, notion pertaining to supply chains has steadily evolved from a narrow focus on tangible goods and their movement for the purposes of manufacturing to broadened consideration of (1) the nature of "goods" offered in the market and (2) the scope of managerial architectures within and between firms for doing so. The broadening consideration of thought within marketing and SCM has led to expansion of the breadth and scope of the disciplines over time. This expansion has been a critical source for SCM's advancement but also led to some confusion. On the one hand it has enabled SCM to better address its integration goals, but on the other it has created challenges for its understanding and development. It has also resulted in perceived redundancies with other disciplines in some areas.

LITERATURE REVIEW

In the area of business procurement, purchasing & operations, the term "supply chain management" is heard with increasing frequency. A supply chain has been defined as, "encircling all activities associated with the flow and conversion of goods from the raw materials (extraction) stage, through to the end user" (Handfield and Nichols 1999). Supply chain management has been defined as "a systems approach to managing the entire flow of information, materials, and services from raw materials suppliers through factories and warehouses to the customer (Leenders and Fearon 1997). Obviously, from these definitions, supply chain management is a broadly encompassing concept that can include basic marketing elements such as product, price, place (channels), and communications (promotion). Therefore, supply chain management appears to be a concept that marketing can neither afford to ignore nor wait for buyers to initiate. Because supply chain management involves the integrated management of the entire supply chain from raw material to end user, marketing may be involved in two types of situations vis-a-vis supply chain management: (1)Marketing's firm may be a supplier into a supply chain managed business situation or, (2)Marketing's firm may be the buyer or customer in a supply chain managed business situation. The classic marketing situation, or course, would be the first one where marketing's firm is the supplier. Conceptual and empirical research on the concept of market orientation has long suggested that interfunctional coordination is key to achieving the main goal of marketing, the creation of superior customer value (e.g. Jaworski and Kohli 1993, Kohli and Jaworski 1990). As a consequence, a stream of research on the relationship between marketing and R&D (e.g. Gupta et al. 1986), marketing and finance (e.g. Rajendra et al. 1998), marketing and engineering (Fisher et al. 1997) and the integration of marketing with several other functions in the formation of business strategy can be traced (e.g. Hutt et al. 1988; Kahn and Mentzer 1998).

RESEARCH METHODOLOGY

The review of literature suggest that in order to find various activities those have an impact on supply chain the quantitative method employing personal (direct) survey was selected and for this purpose the descriptive type of research has been. The study is based upon the primary survey and data

was collected from 120 manufacturer, distributors & retailers from Jammu region (J&K) with the help of a well designed pre-tested structured questionnaire. The present study is descriptive and conclusive in nature and the sampling technique used was Regression & Factor Analysis. After getting the key factors that affect the supply chain and for quantifying the impact of promotional schemes on supply chain the linear regression model has been used; as stated in equation (1).

$$Y= \beta_0 + \beta_1 Y_{1+} \beta_2 Y_2 + - - - + \beta_n Y_{n+} \mu_I \qquad (1)$$

$$\text{Here; } S = f(Y_1 + Y_2 + ---- Y_n) \qquad (2)$$

Where "S" is supply chain factors, marketing & supply chain activities, X_1, X2 & X_n will be those factors which have impact on the supply chain,β_1 β_2 & β_n are the regression coefficient of respective factor with various promotional schemes & μ_I is the error term. Then data is interpreted along with the analysis to make it more understandable to evaluate the impact of various activities. For this purpose required information was obtained from sample population.

RESULTS AND DISCUSSION
The result from the descriptive statistics in SPSS shows that among the overall respondents, 56.66 % were from Jammu city and the rest were from the adjoining areas like Katra, Akhnoor etc.The sample collected has been firstly checked for the reliability using Cronbach's Alpha in Factor analysis and is shown in Table1.

Cronbach's Alpha	N of Items
.766	33

TABLE 1 Reliability Statistics

Table 1; depicts that the value of the Cronbach's Alpha is 0.766 and as it comes out to be greater than 0.6; it implies that the data collected was reliable. Cronbach Alpha can take any value less than or equal to 1, including negative values, although only positive values make sense. Higher values of alpha are more desirable (Cronbach, L. J. 1951).The mean & standard deviation of the various variables used in the study. Mean was found to be highest for the Promotional schemes affect the level of inventory, Higher sales are achieved by promotions/advertisements & lowest for kind of promotional schemes are usually followed by you. In the next step factor analysis was conducted on the collected sample observations; so first of all KMO and Bartlett's Test was conducted whose results are shown below in table 2.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.556
Bartlett's Test of Sphericity	Approx. Chi-Square	337.347
	Df	120
	Sig.	.000

TABLE 2   KMO and Bartlett's Test

The value of KMO from the results was 0.556 which should be above 0.5 & also the value of Bartlett's test is significant so it can be assumed that the factor analysis test is suitable for the data/ samples collected (Kaiser, H. F. (1963), Bartlett, M. S. (1950).

	COMPONENTS		
	1	2	3
X16	0.783		
X22	0.742		
X29	0.672		
X36	0.664		
X14	0.651		
X10	0.557		
X28		0.839	
X7		0.838	
X9		0.743	
X35		0.594	
X33		0.46	
X26			0.832
X12			0.747
X39			0.737
X37			0.417

Table 3; Descriptive Statistics for Rotated Component Matrix.
In the table 3; all the variables having factor loading less than 0.4 are not shown, then the obtained results from the table 3; shows that variables like Fill rate during promotions are highly loaded at first component so they are grouped under the factor called Y_1, variables of Order Size are highly loaded at second factor hence the are grouped under the factor called Y_2, ans similarly variables like cost of Holding are highly loaded at eleventh component so grouped under the factor called Y_{11}.

$$\text{As; } Y= \beta_0 + \beta_1 Y_{1+} \beta_2 Y_2 + - - - + \beta_n Y_{n+} \mu_I \quad \text{......... From eq. (1)}$$

And; P = f (Y1+Y2+----Yn) from eq. (2)

Where ;Y1= f (X16, X22, X29, X36, X14, X10); Y2= f (X28, X29, X35, X41, X33)

Y3= f (X26, X12, X39,X37);Y4= f (X15, X32,X8,X24);Y5= f (X9, X7, X12, X15)

Y6= f (X13, X20, X19);Y7= f (X34, X31);Y8= f (X21, X11);Y9= f (X38,X23);Y10= f (X27)

$Y_{11=}$ f(X18, X17));β_1, β_2, $\beta3$ _ _ _ β_n

represents the regression coefficient of the corresponding factor & μ_I is the error term.

Model	R	R Square	Adjusted R square	Std.Error of Estimate	R Square Change	Change Statistics			Sig. F
						F Change	df1	df2	Change
1	0.785	0.616	.116	0.40882	.198	2.420	11	108	.010

TABLE 4(a):- Regression Analysis.

The R value is significant at 1% level of significance which means that promotional schemes & various deduced variables have a relationship.

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta	B	Std. Error
	(Constant)	0.281	0.504		0.558	0.578
	V_1	0.305	0.133	0.272	2.298	0.023
	V_2	0.054	0.057	0.106	0.948	0.345
	V_3	-0.102	0.072	-0.155	-1.43	0.156
	V_4	-0.036	0.09	-0.052	-0.394	0.695
	V_5	0.129	0.062	0.211	2.075	0.04
	V_6	-0.047	0.08	-0.062	-0.592	0.555
	V_7	-0.032	0.1	-0.037	-0.322	0.748
	V_8	0.188	0.072	0.3	2.608	0.01
	V_9	0.036	0.044	0.078	0.812	0.419
	V_{10}	-0.017	0.043	-0.038	-0.405	0.687
	V_{11}	0.163	0.12	0.184	1.364	0.175

TABLE 4(b):- Regression Analysis.

(Supply Chain Factors)
S=0.281+.305V1+.504V2-.102V3-0.36V4+.129V5-.047V6-.032V7+.188V8+.036V9-.17V10+.163V11+μ (error).

After factor analysis the deduced factors are regressed with the promotional schemes variable and result are shown in the table 4 a & b; only the variable first, fifth& eighth were found to be significant and all other factors are not significant for the study.

CONCLUSIONS
From the deduced regression equation we can easily understand that out of eleven grouped factors there are only three

factors which are affecting the supply chain the factors like fill rate, impact of promotions on demand and cost of holding are significant. And fill rates affect supply chain maximum. In today's markets, understanding the customer's situation and responding effectively to differing needs through the coordination of marketing and supply chain can be a source of superior value creation. Promotions/Marketing is traditionally externally focused and creates customer value, while SCM is inwardly focused and concentrates on the efficient use of resources in implementing marketing decisions. Promotions/Marketing and SCM integration is between those generate demand with those who fulfill it. The results from this analysis are in concurrence with the study by (Soonhong Ming & John T. Mentzer, 2000).Untill today, the concept of integration has been addressed from SCM and operations perspectives.

RESEARCH LIMITATION

The study was conducted in the Jammu region only and the responses depend upon the mood of the respondent while answering the questions, so in future the study can be extended beyond the Jammu region & a wide variety of products can be involved with more number of specific variables and also some different method of analysis can be used

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