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BENEFITS AND SUPPLY CHAIN MANAGEMENT IN MANUFACTURING COMPANIES IN CHENNAI

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Introduction

Customising the supply chain strategies refers to the Mass Customization that requires an agile supply chain to function optimally. Supply chain agility is the extent of network- capability that the organization possesses. Key to the success of an agile supply chain is the speed and flexibility with which these activities can be accomplished and the realization that customer needs and customer- satisfaction are the very reasons for the network. Customer satisfaction is paramount. Achieving this capability requires all physical (materials-movement) and logical events (Information flow) within the supply chain to be enacted swiftly, accurately, and effectively. The faster the information, and decisions-flow through an organization, the faster it can respond to customer needs.

Therefore the benefits of customising supply chain strategy are lowering supply chain costs and effective customer service. Supply chain strategies define how the supply chain should operate in order to compete. It is an iterative process that evaluates the cost benefit trade-offs of operational components.

SCM Customization

Companies implement a customization-strategy when trying to gain a competitive advantage through a supply chain strategy, whereby they deliver a product or service, customized for a particular target market by, firstly, being able to detect trends in the market and, secondly, to quickly respond to a particular trend so that the product actually is available to the specific group of customers in a competitively reasonable space of time. The goal is to complete for a market using more than just price and complete by providing product specific value or service-experience itself.

Benefits of SCM

The aim of any manufacturing/services firm is to produce goods to meet the end-customer requirements. One of the key differentiators which influence a customer's buying-behaviour is the price of the product. This is especially true for a mass market like India, where volumes are more important. Another reason for this is the increasing maturity of many industries and the mass commoditization of products. In such a case, the product-price and on-time-delivery becomes a very critical factor. With the cut-throat competition and increasing input- prices, cost-reduction is a must to help maintain/increase margins. The competition is so intense that a small price-rise of a product might cause huge reduction in demand for that product. Secondly, there is always a push from the shareholders to maximize their return on investments.

As operations cost for a major part of the cost that goes into the product, supply chain- cost is the single most important area for cost-reduction. However supply chain cost-reduction needs to be followed with the customer in focus i.e. there should be no compromise on either the quality of the product or technology or customer-service. Also cost- reduction has to be a continuous improvement programme rather than a one-time attempt, keeping in mind the ever demanding customers who want a better-quality- product at a lower price. Thus supply chain cost reduction is one of the most critical tasks facing the Indian companies. When the competition is no longer among individual companies but among entire supply chains, every area of end to-end cost reduction needs to be looked into.

Review of Literature

Forrester J.W.(1999) indicates systems approach to Supply chain members and their supply chain management. Each member is an Entity with system elements of Input, Processes, output, control, feedback and boundary conditions. It explains the ramifications created by internal and boundary conditions. It also deals with outside or environmental pressures on the system elements.

Poirier C.C. (2002), advocates the four levels of supply chain optimization. The level one, 'Sourcing and Logistics' and level two, 'Internal Excellence' come under "Internal control". The level, three, 'Network Construction' and level four, 'Industry Leadership' come under "External control". Every Organization can assess their status level and strive to the next level.

Sunil Chopra and others (2008) describes the Supply chain management strategies, network design, cross functional and logistical drivers and metrics, Impact of Information Technology and coordination.

Bowon Kim(2005), explains a 3C Model for building Supply chain management with sustainable competitive capability. Competitive priorities for supply chains are low cost, consistent quality, and on-time delivery. The 3Cs are Calculus, Creativity and Commitment. Calculus represents in-depth, fundamental analysis before making any resource/strategic commitment to particular choices or actions. The levels of calculus (analysis is logical, robust and /or thorough enough) will affect the competitive strategy.

Research gap

The Review of Literature identifies the gap in the Literature. There are few studies about the SCM implications in manufacturing Industry and supply chain management in India. The Literature covers only a part of the SCM and its implications over profitability of the company. A comprehensive list of all SCM Functions at Operating, tactical and Strategic Levels is not available. Most of the Literature studies are originated from developed countries. The marketing demand, systems, practices, procedures, standards, cultures and labour content and labour relations are different. Hence their suitability and adoptability are limited.

Objectives of The Study

1. To examine the influence of organisational details of respondents and various suitability of the SCM systems on cost reduction in manufacturing sectors.
2. 2.To analyse the influence of cost reduction of SCM on the manufacturing companies.

Methodology

The Study is conducted with the help of primary and secondary Data. The primary data is collected from the different manufacturing companies in Chennai and their T1 and T2 suppliers. The secondary data is collected from books, journals and web sites etc.,

Sample Size

The respondents are selected from Production Planning and Supply Chain Management Departments of companies and suppliers. The population of manufacturing company is unknown. At the first stage 200 questionnaires are circulated to above said respondents by following simple random sampling method. Only 189 respondents returned their responses. Out of the 189, 17 responses are found to be incomplete and cannot be used for Research. The remaining 172 are completely filled and used for the Research. Hence the sample size of the Research is 172. Care is taken while selecting the respondents to see that the selected sample represents the universe.

Data Analysis

Since the study deals with multivariate analysis , the researcher used t-test, factor analysis by principal componentmethod and linear multiple regression analysis to analyse both independent and dependent variables.

Analysis and Discussion

T-Test for different ways of establishing Supply chain Management in an organization

The supply chain process is an important aspect in any manufacturing sector to increase organizational productivity. SCM is a conglomeration of several elements (See appendix). These elements and their important are recognized by the execution in different department of manufacturing companies. The researcher considered 13 elements of SCM and their important is analyze through a parametric 't' test. The application of't' test and 13 elements of supply chain brought the following results.

Table 1,One sample statistic for elements of SCM

Elements of SCM	N	Mean	Std. Deviation	Std. Error Mean
Close partnership with suppliers	372	4.4839	.68545	.07108
Close partnership with customers	372	4.3871	.67618	.07012
JIT supply	372	4.3978	.73927	.07666
e-procurement	372	4.4731	.60057	.06228
Outsourcing	372	4.4086	.67946	.07046
Subcontracting	372	4.5269	.66906	.063728
3PL	372	4.3978	.67791	.07030
Plan strategically	372	4.4731	.71614	.07426
Supply Chain Benchmarking	372	4.3333	.74211	.07695

Few Suppliers	372	4.5161	.77478	.08034
Holding safety stock	372	4.4194	.75646	.07844
Use of external consultants	372	4.3656	.86959	.09017
Others	372	4.2151	.89503	.09281

From the above table it is found that the mean value of the 13 variables ranges from 4.21 to 4.52 and standard deviation ranges from .60 to .89. The standard error of the mean also consistent and is varies from.062 to .092. This leads to the computation of parametric 't' value as shown in the table below

Table 2,One sample T-Test for different ways of establishing Supply chain Management in an organization

	Test Value = 3					
Elements of SCM	**t**	**df**	**Sig. (2-tailed)**	**Mean Difference**	**95% Confidence Interval of the Difference**	
	Lower	**Upper**	**Lower**	**Upper**	**Lower**	**Upper**
Close partnership with suppliers	20.877	371	.000	1.48387	1.3427	1.6250
Close partnership with customers	19.783	371	.000	1.38710	1.2478	1.5264
JIT supply	18.235	371	.000	1.39785	1.2456	1.5501
e-procurement	23.655	371	.000	1.47312	1.3494	1.5968
Outsourcing	19.992	371	.000	1.40860	1.2687	1.5485
Subcontracting	22.008	371	.000	1.52688	1.3891	1.6647
3PL	19.885	371	.000	1.39785	1.2582	1.5375
Plan strategically	19.837	371	.000	1.47312	1.3256	1.6206
Supply Chain Benchmarking	17.327	371	.000	1.33333	1.1805	1.4862
Few Suppliers	18.871	371	.000	1.51613	1.3566	1.6757
Holding safety stock	18.095	371	.000	1.413725	1.2636	1.5751
Use of external consultants	15.144	371	.000	1.36559	1.1865	1.5447
Others	13.092	371	.000	1.21505	1.0307	1.3994

From the above table it is found that the 't' values 20.877, 19.783, 18.235, 23.655, 19.992, 22.008,19.885,19.837, 17.327, 18.871, 18.095, 15.144, 13.092 are statistically significant at 5% level and all the 't' values are positive with consistent standard deviation. Therefore it can be concluded that the executives in manufacturing companies strongly agree the e-procurement, sub contracting and close partnership with suppliers. They strongly believe these elements of supply chain are very important of organization for smooth flow of supply chain through the entire department. Secondly for the best practices of supply chain management the executives agree to consider the following factors close partnership with customers, outsourcing, 3PL, Plan strategically, few Suppliers, Holding safety stock. Finally the executives of Manufacturing companies neutral to consider the given elements Supply chain benchmarking, use of external consultants and other factors for the perfect practices of SCM.

Factor analysis for benefits of Supply Chain Management

The main purpose of this exploratory factor analysis is to extract predominant factors influencing the supply chain management in manufacturing companies. The parsimonious scale consists of four items pertaining to supply chain management in manufacturing companies. The application of Principal Component Factor Analysis is presented below:

Table 3,KMO and Bartlett's test for the benefits of SCM in manufacturing companies

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.830
Bartlett's Test of sphericity	Approx. Chi-Square	620.266
	Df	78
	Sig.	.000

From the above table KMO and Bartlett's Test it is found that the sampling adequacy value 0.830 and the Chi-Square value for Bartlett's Test of sphericity 620.266 are statistically significant at 5% level. This means that the 13 variables relating to benefits of SCM in Manufacturing companies are adequate in demonstrating its concept and the sampling distribution is also

normal to explain benefits of SCM in manufacturing companies. The following Communality table explains the variances of benefits of SCM in manufacturing companies.

Table 4.,Communalities for the benefits of implementing SCM in manufacturing companies

Benefits	Initial	Extraction
Better Quality of information	1.000	.626
Better quantity of information	1.000	.520
Flexibility	1.000	.637
Reduced lead-time in production	1.000	.734
Cost saving	1.000	.790
Forecasting	1.000	.614
Resource planning	1.000	.574
Better operational efficiency	1.000	.629
Reduced inventory cost	1.000	.614
More accurate costing	1.000	.733
Inter coordination with suppliers	1.000	.749
Inter coordination with customers	1.000	.659
Increased sales	1.000	.810

Extraction Method: Principal Component Analysis.

From the above table it is found that the variance of the 13 variables of benefits of SCM in manufacturing companies ranges from 0.520 to 0.810. Therefore this varies from 52 % to 81%. The upper limit of the variance is statistically significant and as the implication of properly segregated predominant factors as expressed in the table below:

Table 5,Total Variance Explained for the benefits of implementing SCM in manufacturing companies

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
Better Quality of information	5.729	44.068	44.068	3.600	27.691	27.691
Better quantity of information	1.641	12.623	56.691	2.887	22.211	49.902
Flexibility	1.319	10.145	66.836	2.201	16.934	66.836
Reduced lead-time in production	.938	7.217	74.053			
Cost saving	.705	5.420	79.473			
Forecasting	.587	4.518	83.991			
Resource planning	.448	3.449	87.440			
Better operational efficiency	.379	2.917	90.357			
Reduced inventory cost	.348	2.679	93.036			
More accurate costing	.311	2.392	95.428			
Inter coordination with suppliers	.238	1.827	97.255			
Inter coordination with customers	.189	1.454	98.710			
Increased sales	.168	1.290	100.000			

Extraction Method: Principal Component Analysis.

From the above table it is found that the 13 variables are reduced into 3 major factors with eigen values 3.600, 2.887 and 2.201 are statistically significant. The 3 major factors also possess significant individual values 27.691, 22.211 and 16.934 with total cumulative variance 66.836. This clearly indicates the very existence of 3 major factors with their respective variable loadings as expressed in the table given below:

Total 6,Rotated Component Matrix (a) for the benefit of implementing SCM in manufacturing companies

	Component		
Component	1	2	3
Reduced lead-time in production	.765		
Cost saving	.754		
Resource planning	.703		
Flexibility	.692		
Better Quality of information	.628		
Forecasting	.591		
Better operational efficiency	.556		
Better quantity of information	.542		
Inter coordination with suppliers		.837	
Reduced inventory cost		.770	
More accurate costing		.746	
Increased sales			.859
Inter coordination with customers			.692

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a Rotation converged in 8 iterations.

From the above table it is clear that there are three factors to be considered for benefits of implementing SCM in manufacturing companies

The first factor consists of 8 variables

1. Reduced lead-time in production (0.765)
2. Cost saving (0.754)
3. Resource planning (0.703)
4. Flexibility (0.692)
5. Better Quality of information (0.628)
6. Forecasting (0.591)
7. Better operational efficiency (0.556)
8. Better quantity of information (0.542)

Hence, the first factor can be called as **"Efficiency increase"**

The second factor consists of 2 variables

1. Increased sales (0.859)
2. Reduced inventory cost (0.770)
3. More accurate costing (0.743)

Therefore, the second factor is named as **"Cost effectiveness"**

The third factor consists of 3 variables

1. Inter coordination with suppliers (0.837)
2. Inter coordination with customers (0.692)

Therefore, the third factor is named as **"Coordinating effects"**

The benefits of supply chain in manufacturing industry can be realized as efficiency increase of organization and the cost effectiveness for its operational efficiency. The predominant benefit of SCM is its co-ordinating effect with suppliers and customers. This paves the way for the organization to get a smooth flow of supplies as well as to deliver the goods and orders to the customers.

Findings and Conclusion

The supply chain is considered as the most significant resource activating all other resources in manufacturing industry which are production driven. The supply chain objectives are accomplished by strengthening the management strategic activities, maintaining the production level, to maximise their production potential. Strong management strategic activities initiate creative skills and initiate the suppliers to innovate new products and services. Shop floor production activities are fulfilled through conducive supplier development, production planning and developmental climate prevailing in the organisation. New dimensions of Orchestration of SCM in the form of discussions on production, performance measurement, manufacturing reviews are to be incorporated to retain production capacity.

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