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Benefits of Supply Chain Management in the Manufacturing Sector

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Abstract: ***Under vision 2030, Kenya aims to become the provider of choice for manufactured goods in eastern and central Africa. Kenya manufacturing sector has performed dismally over the past two decades: contributes about 13% of the GDP reasons among many include competition from cheap products, inadequate research and development, insufficient management, low capacity utilization and limited technology development. The objective of this study was to survey the extent of implementation of supply chain management (SCM) in the manufacturing sector as they strive to improve their productivity with the view to stay put in this era of global markets competition. The study was conducted in selected manufacturing firms in Nakuru Town. It assessed the components, levels, challenges and benefits of SCM in the manufacturing sector. The research hypotheses were on components, level, challenges, and benefits accruing from implementation of SCM. Mixed methodology (Qualitative and Quantitative) was adopted because it gives a deeper understanding .Since data collection was non-parametric quantitative data was analyzed using chi square test with a level of significance of $\alpha = 0.05$. Simple stratified random sampling technique was used in selecting the manufacturing firms and data was collected, using purposive sampling from participants using questionnaire and interview schedules to obtain qualitative information from top managers, production, marketing, finance and human resource managers, and analyzed using statistical presentation and software systems (SPSS). The results indicated that there are specific components of SCM in the manufacturing sectors that are operating at the recommended SCM levels. There are benefits accruing from SCM amid challenges found in this study. Based on the findings the study recommended management to bring to the attention the awareness of SCM, facilitate identification of components, Levels of SCM in the manufacturing sector. The Kenya manufacturers association should embrace SCM as a modern management concept in the manufacturing sector.***

Keywords: Benefits, Supply Chain Management, Levels, Management Methods, Procurement

1. Introduction

SCM represents the system approach to the total flow of a distribution channel from supplies to the ultimate user (Cooper and Ellram, 2001). Viewing the channel as a whole rather than as a set of fragmented parts. Supply chain runs from suppliers through to customers or stores and requires process technology and people for success; this is true regardless of the industry. SCM uses a tool called just in time (JIT); a manufacturing system which states that supplies are purchased in the time to be used, parts are produced in time to be transported and sold (Kalpakjian, 1991). It is a system in which both the movement of goods during production and deliveries from suppliers are carefully timed so that at each step of the process the next batch arrives for processing just as the preceding batch is completed. This result to a system with no idle items waiting to be processed (Stevenson, 1999). Figure 1. shows the flow of materials and information flow in supply chain management.

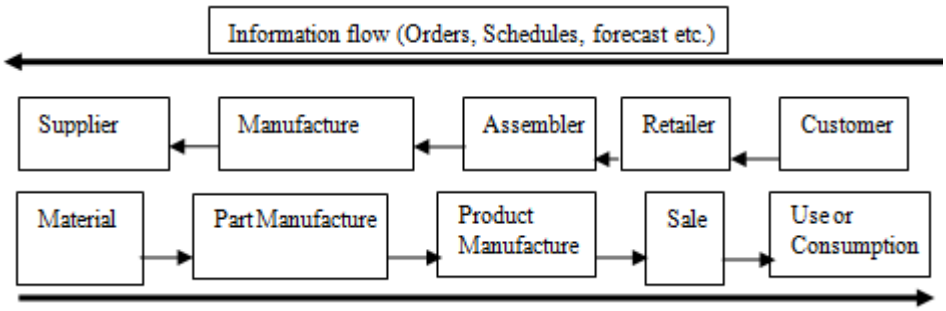

Figure 1: Generic Configuration of a Supply Chain Manufacturing
Source: Vrijhoef (2000)

As shown in Figure 1. the flow of materials starts from the supplier to the user this flow is often referred to as downstream flow. While the information flow starts i.e. orders, schedule forecast starts from the customer back to the supplier; this flow is referred to upstream flow.

A strong SCM carefully implemented would enable Kenyan manufacturing firms to compete favorably locally and internationally in today's difficult business environment; where Firms are constantly searching for improvement in product production, systems management and customer satisfaction. Since Mid 1980's Kenya has been under

increasing pressure to strengthen its industrial competitiveness (Republic of kenya2000). This has been due to a number of factors that include the various regional integration arrangement such as a General Agreement on Tariffs and Trade (GATT), Common Market for Eastern and Southern Africa (COMESA), and East Africa Co-operation EAC ; the opening up of the regional forces, places the country on a competitive edge (Republic of Kenya, 2000).

This greatly affects manufacturing industries especially in the areas of handling, storage and issuing of raw materials and finished products, which increase production cost. This is in the wake of the government having declared her vision of becoming a newly industrialized country (NIC) by the year 2020 (Republic of Kenya, 1996) and now the vision 2030, which has identified manufacturing as one of the prime movers of economic development (The Republic of Kenya, 2007). SCM has been implemented in manufacturing sector to enable them to compete and to subsequently cope with the world economic competition, this study surveyed implementation of SCM in the manufacturing sector by assessing the benefits.

To survive in a competitive business environment, a manufacturing firm has to evolve efficient manufacturing process and technology bring people into picture, people have to be trained in the latest technologies, management skills and processes in the area of design manufacturing and most important the tools of integration (Singh, 1995).

It is against this scenario that this study sought to establish the extent of implementation of SCM as a modern management concept by assessing benefits. Researched benefits of SCM are: improve forecast accuracy, reduced inventory levels, reduced operation costs for logistics, warehousing and manufacturing, improved planning and scheduling and improved customer service (Steve Globle, 2006).

The specific objectives of this study was to:Establish the benefits of supply chain management in the manufacturing sector, hypothesis tested in the study at α =0.05 was there are no significant benefits of supply chain management to the manufacturing sector. Research has shown that SCM comes with benefit if carefully implemented with proper structures put in place. (Steve, 2006) has given the following benefits of SCM; Improved forecast accuracy, Improved planning and scheduling capabilities, reduced inventory levels, increased asset utilization, reduced manufacturing replenishment lead times and accelerated supply chain responses times, reduced costs of logistics, warehousing and manufacturing, dramatically improved customer service ratings, reduced volume of errors and exception processing, and streamlined move efficient processes.

2. Methodology

This was a survey research study. In this research design manufacturing industries were picked using stratified, random sampling technique.The target was manufacturing industries in Nakuru town, Nakuru district, in the central Rift Kenya. There were 30 manufacturing firms in Nakuru town. The firms were stratified by the category of industry out of which: 2 were construction and engineering, 12 food and agriculture, 8 textiles and 8 chemical. Stratified random sampling was suitable because of the four types of industries represented in the Nakuru town. Simple random sampling was used to select the industries of each category. There were 15 industries, which was at least 50% of the manufacturing industries in the Nakuru town, and were distributed as, Construction and engineering 2, Food and agriculture 6, Textile 4, Chemical 4. purposive sample was used to select at least one respondent that took part in this study in each of the 15 industries. This was done purposively to obtain respondent with specific or insight and comprehensive knowledge on the subject of the study. There were 28 respondents that made up the sample size.

Table 1: Distribution of Respondents by Category of Industry

Category of industry	Respondents
Construction	2
Food and agriculture	11
Textile	7
Chemical	8
Total	28

Questionnaires was used to collect data from top managers who in this study were considered well versed with the subject under study. The questionnaire had both close-ended items and open-ended items. Each respondent had to respond to the items by himself/herself simple language was used in the questionnaire items touching on benefits of SCM.

Structured interview facilitated gathering a lot of information and in greater depth. It also helped the researcher to collect supplementary information about the SCM in the manufacturing sector both in terms of the professional training and the environment that was of great importance in interpreting the data. Data collected from the questionnare.. Statistics and Presentation System Software (SPSS) packagewas used to analyze data. While data collected from the interview schedule was analyzed qualitatively.

Frequencies, means and percentages were determined and subsequently used to describe the extent of implementation of supply chain management in the manufacturing sector. Chi-square(x^2)-test was used to determine any significance difference in implementation of SCM in terms of benefits.

3. Results and Discussion

Table1 shows the number of Yes responses is 26 (92.9%) and No 2(7.1%) on the benefits of SCM in the manufacturing sector.

Table 2: Frequencies on benefits of SCM in manufacture sector

		Frequency	*Percent*
Valid	Yes	26	92.9
	No	2	7.1
Total		28	100%

Source: SPSS results

The chi-square frequencies were computed for the item on benefit of implementation of SCM in manufacturing sector is as illustrated in table2.

Table 3: Ratings of the benefits

Benefits	HA		A		NI		D		HD	
	F	%	F	%	F	%	F	%	F	%
Improve forecast accuracy	7	25	20	71.4	1	3.6	-	-	-	-
Improve planning and scheduling	8	28.6	19	67.9	1	3.6	-	-	-	-
Reduced inventory levels	7	25	20	71.4	1	3.6	-	-	-	-
Increase asset utilization	7	25	19	67.9	1	3.6	-	-	-	-
Reduce replenishment	7	25	20	71.4	1	3.6	-	-	-	-
Reduce cost for logistics	9	32.1	17	60.7	1	3.6	-	-	1	3.6
Improve customer service	11	39.3	17	60.7	-	-	-	-	-	-
Reduce volume of errors	11	39.3	16	57.1	1	3.6	-	-	-	-

HA-Highly Agreed A-Agreed NI-No Idea D-Disagreed HD-Highly Disagreed
Source: SPSS result

Table 3 shows the ratings of the benefits of SCM in manufacturing sector in frequency and percentage

Table 4: Frequencies on benefits of Implementation of SCM

Likert scaling	*Observed (O)*	*Expected (E)*	*Residual*
3.13	1	3.1	-2
3.88	1	3.1	-2
4	11	3.1	7.9
4.13	4	3.1	0.9
4.25	1	3.1	-2.1
4.5	3	3.1	-0.1
4.63	3	3.1	-0.1
4.75	2	3.1	-0.1
5	2	3.1	-1.1
Total	28		

Source: SPSS Frequencies test result

The chi-square test statistics for the same item, benefits of SCM were tabulated and illustrated in the table 5 below: -

Table 5: Chi square test on the benefits of supply chain management

Item	Chi- square	df	p-value	α
Benefits of SCM Implementation	25.357 (15.507*)	8	1.86	0.05

Source: SPSS test result

The Calculate chi-square value (25.357) is greater than the table Chi-square value (15.507) therefore the null hypothesis was rejected at 0.05 level of significance.

The results (Table 1) obtained in the study on the benefits of supply chain management in the manufacturing sector indicated that 26(92.9%) respondents said that there are benefits while 2(7.1%) of the respondents said there are no benefits. The 92.9% yes is more significant and it indicates there are benefits of implementing the SCM in the manufacturing sector. The chi-square test statistics gave a chi square value of 25.357, df = 8 and α = 0.05. The table chi square value is (15.507). This shows the calculated value of chi square is greater than the table chi-square value therefore the Null-hypothesis that there are no benefits of implementing SCM in the manufacturing sector was rejected supply chain management is supported by research done by (Goble, 2006). Who gave the following benefits among others; improved forecast, improved planning and scheduling increased asset utilization.

The generally agreed benefits (table 3) of implementing supply chain management, by number and of respondents and percentage were: improved customer service 17 (60.7%), reduced. Volume of errors 16 (57.1%), improved planning and scheduling 19 (67.9%), increased asset utilization 19 (67.9%), reduced manufacturing replacement lead times 20 (71.4%), improved forecast 20(71.4%), reduced costs of logistics 17(60.7%). These results indicate that manufacturing industries have benefited by implementing SCM. Other benefits as gathered from interview include: improve customer service, reduce volume of errors, improve delivery of services, improve organization internally, improve income due to better monitoring of the markets, and improve utilization of resources.

4. Conclusion

There are benefits of implementing supply chain management in the manufacturing sector as shown by the result 26 (92.9%). These benefits include: a) Improve forecast accuracy; b) Improve planning and scheduling; c) Reduce inventory levels; d) Increase asset utilization; e) Reduce manufacturing replenishment lead times; f) Reduce costs for logistics; g) Improve customer service; h) Reduce volume of errors ; I) Improve delivery of services; j) Improve organization internally; k) Improve income due to better monitoring of the markets; l)Improve utilization of resources

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