Challenges Faced in the Implementation of Supply Chain Management in the Manufacturing Sector

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Abstract: *The twenty first century market is characterized by high variety and relatively low demand for individual products. Kenya manufacturing sector whose share of gross domestic product (GDP) has increased very little 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. This study surveyed the extent of implementation of supply chain management (SCM) in the manufacturing sector. The study was conducted in selected the fourteen from the thirty manufacturing industries in Nakuru town, kenya. Mixed methodology was adopted; data was collected, using questionnaire and interview schedules to obtain qualitative information from top managers, production, marketing, finance and human resource managers. Data was analyzed using descriptive statistics and chi square test with a level of significance of $\alpha = 0.05$. The results indicated that there are challenges experienced in the implementation of SCM.*

Keywords: Supply Chain Management; Gross Domestic; Product; Manufacturing

1. Introduction

Supply chain management (SCM) is concern with planning, co-ordinating and controlling materials, parts and finished goods from suppliers up to the customers (Stevens, 1989). SCM is presented as an integrative philosophy to manage the total flow of a distribution channel from supplies to the ultimate user (Cooper and Ellram, 2001).

Globalization of markets has put tremendous pressure on manufacturing enterprises to be competitive. To cope with competition pressures, a new paradigm in manufacturing known as agile manufacturing is emerging (Lysons and Famington, 2006). Agile production is the latest stage of a development away from the mass production of the 1970s, through the decentralized production of the 1980s and on to the supply chain management, rates of technician innovation, customers and requirements for customization and choice The main drivers of agility include rapidly changing and unpredictable markets, the rapid titive priorities of responsibility, shorter lifecycles, concern for the environment and international competitiveness.

The literature review conducted indicated that the manufacturing sector in Kenya that contributes about 13% of GDP has been on decline from growth rate of 37% in 1996 to –1.5% in 2000 (Republic of Kenya, 2000). The performance of the industrial sector has been on a decline faced with low capacity utilization, decline in productivity, limited technological advancement and serious competition (Republic of Kenya, 2000). 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 challenges.

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

The specific objectives of this study were to: Establish the challenges in the implementation of supply chain management. Hypothesis tested was: There are no significant challenges being faced in the implementation of supply chain management in manufacturing sector.

2. Methodology

This was a survey research study. Survey was used to collect detailed description of SCM with a view to analyze, interpret, and report the status in order to guide the practice in the immediate future but also to determine the adequacy of status by company with the established standards Lokesh,(1984). 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.

The use of stratified sampling has the effect of reducing sample error due to difference in-group composition (Gall, Burg and Gall 1996). The sampling procedure involved listing of all manufacturing industries into 4 categories of: construction and engineering, food and Agriculture, Textile, and chemical, then a simple random sampling were used to obtain firms from each category. Purposive samply 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 and number of respondents were; construction (2),Food and agriculture(11),Textile(7),Chemical(8).

Questionnaires were 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. It had 16 items that touched on components, levels, challenges and benefits of SCM.Structured Interview Schedule was administered to obtain data for qualitative analyze. Face to face interview was conducted that involved some of the managers: general managers, finance, marketing, and human resource managers. The 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 were in two categories. The first set consisted of data generated by use of questionnaires and the second set consisted of data generated by the interview schedules. Statistics and Presentation System Software (SPSS) package, was 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 challenges. The level of significance was set at alpha level of 0.05.

3. Results and Discussion

The objective of this study in relation to challenges was to establish the challenges faced in the implementation of SCM. Hypothesis in connection with this objective was; there are no significant challenges being faced in the implementation of SCM in the manufacturing sector.

The chi-square frequency results based on this test item from CEO(s) questionnaire were yes (25/28) 89.3% and no (3/28)10.7%.

Table 1: Frequencies of Challenges in Implementing SCM

		Frequency	Percentage
Challenges	Yes	25	89.3
	No	3	10.7
	Total	28	100%

Source: Field Survey

From the frequency table 1 results, 89.3% of the respondents conceded that there are challenges facing SCM while the remaining 10.7% were of the opinion that they were not facing challenges in the manufacturing sector

Table 1: Ratings of the challenges

Challenges	NVS		NS		NI		S		VS	
	F	%	F	%	F	%	F	%	F	%
Complicated Network	8	28.6	13	46.4	-	-	5	17.9	1	3.6
Mistrust and distorted information within the chain	8	28.6	13	46.4	-	-	5	17.9	2	7.1
Difficulty in making decision for every player	7	25	14	50	-	-	5	7.9	2	7.1
Little capacity/stock reserve because of late deliveries	4	14.3	13	46.4	-	-	8	28.6	2	7.1
Lack of responsiveness by customers/supplier	8	28.6	12	42.9	1	3.6	3	10.7	5	17.9
High operation cost	3	10.7	6	21.4	-	-	8	28.6	10	35.7

NVS-Not Very Serious NS-Not Serious NI-No Idea S-Serious VS-Very Serious
Source: SPSS results

Table 1 shows the rating of the challenges presented to the respondents, by frequency and percentage
Table 3shows the chi-square test statistics for this item on the challenges faced in implementation of SCM in manufacturing sector.

Table 2: Chi-square Frequencies on challenges of Implementation of SCM

Likert scaling	Observed (O)	Expected (E)	Residual
1.33	3	1.9	1.1
1.5	1	1.9	-0.9
1.67	3	1.9	1.1
1.83	3	1.9	1.1
2	2	1.9	0.1
2.33	1	1.9	-0.9
2.5	2	1.9	0.1
2.67	3	1.9	1.1
2.83	2	1.9	0.1

3	1	1.9	-0.9
3.17	2	1.9	0.1
3.5	1	1.9	-0.9
4	1	1.9	-0.9
4.33	2	1.9	0.1
5	1	1.9	-0.9
Total	28		

Source: SPSS Frequencies test result

Table 2 shows the chi-square frequencies while Table 3 shows the chi-square test statistics for this item on the challenges faced in implementation of SCM in manufacturing sector.

Table 3: Chi-Square Test for Supply Chain Management

Item	Chi- Square	df	p-value	α
Challenges Faced in the implementation Of SCM in manufacturing sector.	5.214 (23.685*)	14	0.983	0.05

$\chi^2_{Cal} = 5.214$, $\chi^2_{Crit} = 23.685*$ df = 14, p-value = 0.985, α = 0.05

Source: SPSS Test Results for Survey 2007

The Chi-square value (5.214) Table 2 is less than the critical chi-square (23.685) and the p-value (0.983) is greater than 0.05 the set level of significance. Therefore the hypothesis is accepted with p-value = 0.985, df = 14 at 0.05 level of significance. This implies that there are challenges facing the implementation of supply chain management in the manufacturing sector.

The results (Table 1) of the study on the item of challenges shown that 25 (89.3%) respondents accepted that there are challenges being faced in the implementation of the SCM, while about 3 (10.7%) stated there are no challenges. The Chi-square value (5.214) Table 2 is less than the critical chi-square (23.685) and the p-value (0.983) is greater than 0.05 the set level of significance. Therefore the hypothesis is accepted with p-value = 0.985, df = 14 at 0.05 level of significance The above results support other researches that have indicated that there are challenges faced in implementation and during full operation of supply chain management. (Lysons and Fammington, 2006).

The following challenges (Table2) were noted as not serious challenges by most of the respondents. Complicated network13(46.4%), mistrust and distorted information within the chain(13(46.4%), difficult in making decision for every player14(50%), little capacity/ stock reserve because of late deliveries13(46.4%), lack of responsiveness by customer/ supply and the very serious challenge that came out very clearly was the high operation had cost 10(35.7%) respondents of 28(100%) respondents. This also featured greatly during the interview schedule most of those interviewed did put strongly the issue of high operation costs due to high taxes, fluctuating material (raw material) prices, expensive labour, transport cost due to ever sky rocketing fuel prices. High operation costs coupled with competition had threatened to kick some of the industries out of operations.

Other challenges as collected from interview schedule include; high taxation 120% exercise duty on packaging materials, fluctuation of fuel prices (petrol/oils and electricity), and supply of raw materials especially raw milk is too dependent on the weather conditions and environmental bureaucracy.

4. Conclusion

There are challenges experienced in the implementation of SCM in the sector. The result 25 (89.3%) respondents, these challenges are: a) Complicated networks; b)Mistrust and distorted information within the chain; c) Difficult in making decision to every player; d) Little capacity / stock reserve due to late deliveries; e) Lack of responsiveness by customers /suppliers; f) High operation costs; g) High taxation; h)Fluctuation of fuel prices (petrol / oils and electricity); I) Supply of raw materials especially raw milk is too dependent on the weather conditions; j) Environmental bureaucracy

The manufacturing sector, by structuring effectively the components, and putting the levels of SCM in place, while capitalizing on the management to mitigate on the challenges of SCM would increase its productivity, satisfying its customers, and increase their profit margin.

From the findings of this study, the researcher makes the following recommendations:
- The management in the manufacturing sector should bring to the attention of every employee the awareness of supply chain management.
- The management should facilitate the identification of the SCM components to the employees
- The management should facilitate the identification of the levels of SCM in their respective firms.
- The Kenya manufactures association should embrace SCM as a modern management concept in the manufacturing sector.

References

[1] Republic of Kenya(2000).*Kenya vision 2030 ;National planning strategy*
[2] Borg, W.R. & Gall, M.D (1996, 1989). *Educational research; An introduction; (5th &6th Eds)* white plains NY; Longman.
[3] Cooper, M.C, Ellram, L.M, (1993, 2001). *Characteristics of supply chain management and the implications for purchasing and logistics strategy*. International journal of logistics management.
[4] Lysons, and Fammington (2006). *purchasing and supply chain management. 7th Edu.* Pearson Education limited England pg 84-118
[5] Republic of Kenya (2000). *Economic survey central Bureau of statistics* Ministry of finance and planning ,Nairobi Kenya.
[6] Republic of Kenya (1996). *Economic survey central bureau of statistics*, Ministry of finance and planning, Nairobi, Kenya.
[7] Republic of Kenya (2007).*Economic survey* central bureau of planning, and national Development, Nairobi Kenya.