

## **INFLUENCE OF INFORMATION SHARING ON PERFORMANCE OF NEW KENYA COOPERATIVE CREAMERIES LIMITED**

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**Abstract:** *Information sharing is the life blood of supply chain collaboration. The purpose of the study was to analyze influence of information sharing on Performance of New Kenya Cooperative Creameries Limited. Milk processing firm performance was measured by market share, profitability and client satisfaction. The study was guided by the Resource Based View Theory and Strategy-Structure Theory.*

**Methodology:** *Descriptive survey research design was adopted in this study. The target population comprised dairy farmers who supply fresh milk to New Kenya Cooperative Creameries Limited and customers of processed milk products buying at retail supermarket. The study targeted 10,488 fresh milk suppliers and 13,906 customers of processed milk products. The sample size was 384 suppliers and customers.*

**Findings:** *The findings of the study revealed that there is significant effect between Information sharing and Performance of NKCC with regards to customer. A comparative study should be done on the influence of information sharing on performance of other milk processing firms.*

**Keywords:** *Information sharing, Supply Chain collaboration and performance*

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### **1. INTRODUCTION**

#### **Background of the Study**

Information sharing is inter-organisational communication and it has been defined as a traceability system that “facilitates dissemination of information among supply chain partners for the purpose of improving the satisfaction of the ultimate customers of the supply chain” (Zelbst et al., 2010). Sharing information can reduce uncertainty in demand and supply and significantly improve supply chain service levels, decrease inventory levels, lower stock outs, increase product freshness, and greatly reduce product wastage due to time expiry (Ferguson and Ketzenberg, 2006; Kaipia et al., 2013).

Performance of the firm can be measured in several ways. According to Chen and Paulraj (2004), a firm’s performance can be measured in terms of financial performance and operational performance. Firm performance can be also viewed as service effectiveness and cost effectiveness (Richey et al., 2010). Performance can be also measured by cost, quality, delivery and flexibility (Krause et al., 2007). In NKCC, the performance was measured by market share, profitability and client satisfaction.

The study investigated influence of information on performance of NKCC. This will enable the managers of the milk processing firm devise ways of improving performance. However the performance of the milk processing firm faced challenge of ensuring that all products in the firm's local dairy case are fresh, safe, and produced in the most efficient and environmentally-friendly way.

### **Statement of the Problem**

As a consequence of increased globalization, the competition among companies is growing and new ways have to be found to ensure successful firm performance in the new business climate. Sharing information can reduce uncertainty in demand and supply and significantly improve supply chain service levels, decrease inventory levels, lower stock outs, increase product freshness, and greatly reduce product wastage due to time expiry (Ferguson and Ketzenberg, 2006; Kaipia et al., 2013). Information sharing facilitates the cooperation of participating members along the supply chain to improve firms' performance. . The uncertainty of another partner like Suppliers' delivery time going wrong remains a big challenge and the question is "does information sharing have a significant effect on performance of NKCC?"

### **Research Objective**

To analyze the influence of information sharing on Performance of New Kenya Co-operative Creameries Limited.

### **Hypotheses of the Study**

H<sub>01</sub> Information Sharing does not have a significant effect on Performance of New Kenya Co-operative Creameries Limited.

### **Research Questions**

Does information sharing have a significant effect on Performance of New Kenya Co-operative Creameries Limited?

### **Significance of the Study**

The study is in line with the aspirations of Second Medium Term Plan (MTP) (2013-2017) of Vision 2030 and the Jubilee Manifesto. Currently, the dairy sub-sector experiencing one of the highest growth rates, estimated at 3 to 4 % annually and contributing 40% of the agricultural GDP and 4% of the national GDP. It will enable the board identify policies that will enhance the performance of milk processing firms in Kenya. To the academicians and other scholars, the study will shed more light in the field of Performance in the milk processing firms by using as a point of reference.

## **2. LITERATURE REVIEW**

### **Theoretical Framework**

#### **Resource Based View Theory**

Resource Based View (RBV) theory has been widely applied in management research. The main concepts of RBV include the firms' resources, capabilities, and strategic assets. The foundation of RBV argues that the performance of the firms is dependent on these strategic resources. Moreover, information sharing enables the

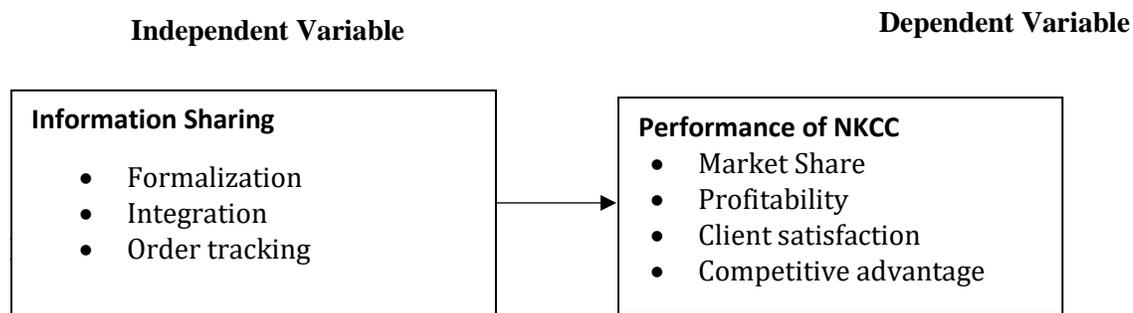
firms to focus on their core competencies. This results in increased specialization and improved economy of scale, enhancing their competitive advantage (Barney, 2012; Park *et al.*, 2004; and Barney, 2001).

**Strategy-Structure Theory**

Strategy-Structure Theory (SST) supports the view that successful firms appear to be taking a more systematic and dynamic view of their supply chain in order to develop more efficient information transfer systems (Handfield and Nichols, 1999; Barney, 1995). This theory is relevant to the study ‘influence of information sharing on performance of NKCC in Transzoia County.

**Conceptual Framework**

The independent variable was information sharing while the dependent variable is performance of NKCC.



**Effects of Information Sharing on Performance of NKCC**

Namusonge’s *et al.*, (2015) in their thesis entitled “Information Sharing, Cooperative Behavior and Hotel Performance” posits that the starting point of supply chain collaboration is information sharing. Information sharing is conceptualized as the act of capturing and disseminating timely and relevant information for decision makers to plan and control supply chain operations. Information sharing provides visibility and help in better decision making. Various information content aspects are involved in the relationships between buyers and sellers. Information can be communicated between the parties by electronic means, such as: Electronic Data Interchange (EDI), Efficient Consumer Response (ECR), Vendor Managed Inventory (VMI), or by personal communication channels, such as: electronic mail (email) or phone (Chopra and Meindl, 2003). IMP Group supports that information exchange formalization is important. The degree of formality depends on the businesses characteristics and size affects the interaction process nature and relationship as a whole.

**3. RESEARCH METHODOLOGY**

The study adopted descriptive survey research design to collect quantitative data from milk suppliers and customers of processed fresh milk. Survey research design is concerned with describing, recording, analysing and interpreting conditions that either exist or existed. It is also concerned with hypothesis formulation and testing the analysis of the relationship between non-manipulated variables (Saunders *et al.*, 2015).

The target population comprised of fresh milk suppliers to NKCC processing plant and customers of buying processed milk products of NKCC at Nakumatt supermarket. The study targeted 10,488 dairy farmers supplying to NKCC and 13,906 customers buying processed milk products.

The following formula was adopted from Mugenda, (2008) to determine the sample size:

$$N = \frac{Z^2 pq}{d^2}$$

$$(1.96)^2 (0.50) (1 - 0.50)$$

$$N = \frac{\text{-----}}{(0.05)^2} = 384$$

For this study, questionnaire was the main tool used to collect data.

Quantitative data analysis was aided by the Statistical Package for Social Sciences (SPSS) version twenty to generate those measures. Since percentages are the most widely used descriptive analysis (Creswell, 2007). SPSS Version 20 has a descriptive statistics feature that assists in variable response comparison and gives a clear indication of the response frequencies. The following multiple regression model was used to establish the relationship between the variables.

$$Y = \beta_0 + \beta_1 X_1 + \varepsilon$$

Where: Y= Dependent variable

$\beta_0, \beta_1$ = Regression co-efficient to be estimated

$X_{1-n}$ =Independent variables

$X_1$  = Information Sharing

$\varepsilon$  = Error term

#### 4. RESEARCH FINDINGS

##### Factor Analysis

##### Supplier Total Variance Explained on Information Sharing

The results from factor extraction on table 4.1 shows three components with Eigen values greater than one were extracted, which represented 69.335 percent of variance in IS. This means that IS can be explained by first three components. Factor 1 account for 42 percent of the variability in all variables, factor 2 accounted for 15percent and factor 3 accounted for 12 percent.

**Table 4.1 Supplier Total Variance Explained on Information Sharing**

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Var	Cum %	Total	% of Var	Cum %	Total	% of Var	Cum %
1	3.792	42.138	42.138	3.792	42.138	42.138	2.554	28.375	28.375
2	1.353	15.029	57.167	1.353	15.029	57.167	1.955	21.727	50.102
3	1.095	12.168	69.335	1.095	12.168	69.335	1.731	19.233	69.335
4	.731	8.117	77.452						

5	.655	7.273	84.724
6	.487	5.408	90.132
7	.378	4.198	94.330
8	.307	3.415	97.745
9	.203	2.255	100.000

Extraction Method: Principal Component Analysis.

**Customer Total Variance Explained on Information Sharing**

With regard to customer, the results from factor analysis in table 4.2 shows three components with Eigen values greater than one (1) were extracted, which represented 67.155 percent of information sharing of NKCC. This means that Performance of NKCC can be explained by first three components. Factor 1 accounted for 41 percent of the variability in all variables, factor 2 accounted for 13percent and factor three accounted for 11 percent.

**Table 4.2 Customer Total Variance Explained on Information Sharing**

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Var	Cum %	Total	% of Var	Cum%	Total	% of Var	Cum %
1	3.743	41.587	41.587	3.743	41.587	41.587	2.121	23.562	23.562
2	1.256	13.954	55.541	1.256	13.954	55.541	2.096	23.290	46.851
3	1.045	11.614	67.155	1.045	11.614	67.155	1.827	20.303	67.155
4	.732	8.137	75.291						
5	.635	7.058	82.350						
6	.510	5.668	88.018						
7	.495	5.505	93.523						
8	.336	3.736	97.259						
9	.247	2.741	100.000						

Extraction Method: Principal Component Analysis.

**Supplier Rotated Component Matrix on Information sharing**

The rotated component matrix in table 4.3 shows factor loadings (FL) of information sharing “Four items on the first factor had strong FL 0.645 to 0.874. This therefore shows that IS can be explained by “capability factors”. The factors loading on the second had strong FL (0.525 to 0.609). This can be explained by “delivery factors” The factors loading on the third factor had strong FL (0.427 to 0.852). This can be explained by “market factors”.

**Table 4.3 Supplier Rotated Component Matrix on Information sharing**

Statements	Component		
	1	2	3
The firm communicates to dairy farmers about its demand	.645	.525	
Effective new Information technology is used to communicate	.876	.185	
Dairy farmers are informed on any change of delivery schedules	.148	.722	.128
Dairy farmers to know early enough on price changes	.702	.113	.427
There is exchange visits to share information	.321	.609	.269
Information on Inventory levels are shared with dairy farmers	.175	.269	.800
Information about new product developments is always shared	.836		.251

Information about milk supply disruptions is always communicated		.806	.159
Information about market conditions shared is always shared	.137	.128	.852

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 4 iterations.

### Customer Rotated Component Matrix on Information Sharing

Table 4.4 below shows Rotated Component Matrix on Information Sharing with regards to customer, factor loadings of Information Sharing “had FL (0.364 to 0.800). This therefore shows that Information Sharing can be explained by “Customers know about price changes”. The factors loading on the second factor had FL 0.364 to 0.774. This can be explained by “Customers know about varied products” The factors loading on the third factor had strong FL between 0.756 and 0.894. This can be explained by “Customers know where to buy”. .

**Table 4.4 Customer Rotated Component Matrix on Information Sharing**

	Component		
	1	2	3
Customers informed on new products introduced	.643	.364	.104
New and effective information technology as a mode of comm.	.706	.231	.155
Milk products are conveniently delivered to customers	.170	.774	.222
Customers get to know early enough about price changes	.800		
The company is aware about customer complaints and respond	.329	.754	
Customers are informed of the varied milk products	.116	.822	.181
Customers are informed on the benefits of new products	.617	.111	.453
Customers know where to buy the firm’s products	.136	.165	.878
Customers understand very well the products of NKCC	.138	.138	.856

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

### Supplier KMO and Bartlett's Test on Information Sharing

Table 4.5 below shows the results of KMO Measure of Sampling Adequacy. Values between .7 and .8 are good and for these data the value is 0.719, which falls in to range of good: so we should be confident that factor analysis is appropriate for these data. Bartlett’s Test of Sphericity result is significant at 0.000 level indicating a significant relationship among the variables and therefore suitable for factor analysis.

**Table 4.5 Supplier KMO and Bartlett's Test on Information Sharing**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.719
	Approx. Chi-Square	1173.322
Bartlett's Test of Sphericity	Df	36
	Sig.	.000

### Customer KMO and Bartlett's Test on Information Sharing

The results on table 4.6 below shows customer KMO and Bartlett’s on information sharing With regards to customer, the value is 0.745, which falls in to range of good: so we should be confident that factor analysis is appropriate for these data. Bartlett’s Test of Sphericity result is significant at 0.000 level indicating a significant relationship among the variables and therefore suitable for factor analysis.

**Table 4.6 Customer KMO and Bartlett's Test on Information Sharing**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.745
	Approx. Chi-Square	939.355
Bartlett's Test of Sphericity	Df	36
	Sig.	.000

**Descriptive Analysis**

**Descriptive Statistics on Information Sharing**

Table 4.7 shows the descriptive statistics on an overall rating of five-point Likert scale of Information Sharing of 342 respondents. Respondents were asked questions and the results were computed as shown below:

**Table 4.7 Supplier Descriptive Statistics on Information Sharing**

Statements	SD %	D %	N %	A %	SA %	Total %
The firm communicates to dairy farmers about its demand	7.0	28.9	22.5	36.8	4.7	100.0
Effective and new Information Technology is used to communicate to dairy farmers	23.7	35.7	14.6	21.1	5.0	100.0
Dairy Farmers are informed on any change of delivery schedules effectively	2.0	17.8	25.7	36.0	18.4	100.0
Dairy Farmers get to know early enough about price changes	35.4	33.3	6.1	21.3	3.8	100.0
There is exchange visits both in and outside to share information	10.2	19.6	32.7	34.5	2.9	100.0
Information about inventory levels is shared with dairy farmers	24.9	24.0	39.8	9.6	1.8	100.0
Information about new product developments is always shared with our milk suppliers/farmers	41.2	24.0	17.8	12.6	4.4	100.0
Information about milk supply disruptions is always communicated to farmers	2.9	10.5	15.2	45.3	26.0	100.0
Information about market conditions is always shared to milk suppliers/farmers	22.5	36.5	31.3	6.1	3.5	100.0

Key: SD-Strongly Disagree; D-Disagree; N- Neutral; A- Agree; SA- Strongly Agree

**Customer Descriptive Statistics on Information Sharing**

Table 4.8 below shows the descriptive statistics on an overall rating of five-point Likert scale of Information Sharing of 314 respondents. Respondents were requested to provide information on five likert scale and the results were computed and presented below:

**Table 4.8 Customer Descriptive Statistics on Information Sharing**

Statements	SD %	D %	N %	A %	SA %	Total %
Customers informed on new products introduced	4.5	19.4	26.8	44.3	5.1	100.0

New effective information technology as a mode of communication is used to inform customers on new products	3.2	22.9	20.1	45.9	8.0	100.0
Milk products are conveniently delivered to customers	4.8	6.1	32.2	45.2	11.8	100.0
Customers get to know early enough about price changes	15.0	20.4	20.1	31.2	13.4	100.0
The company is aware about customer complaints and responds on time	12.7	23.2	22.3	32.2	9.6	100.0
Customers are informed of the varied milk products	7.3	19.1	24.2	43.3	6.1	100.0
Customers informed on the benefits of new products	5.4	25.5	29.0	27.7	12.4	100.0
Customers know where to buy the firm's products	0.0	12.1	21.7	43.9	22.3	100.0
Customers understand very well the products of NKCC	1.6	12.7	22.6	35.0	28.0	100.0

Key: SD-Strongly Disagree; D-Disagree; N- Neutral; A- Agree; SA- Strongly Agree

**Regression Analysis**

**Supplier Correlation Analysis**

The results on the Table 4.9 below show supplier correlations. Correlation is often used to explore the relationship among a group of variables and in turn helping in testing for multicollinearity (Pallant, 2010). Numbers are Pearson correlation coefficients, which go from -1 to 1. The closer to 1 means strong correlation. A negative value indicates an inverse relationship. The correlation analysis of the study revealed that IS (r=.151, indicating there positive relationship on Performance of NKCC. The correlation analysis of the study revealed that IS (r=.151, p=.003), a positive relationship on Performance of NKCC.

**Table 4.9 Supplier Correlations Results**

		Performance	Information
Pearson Correlation	Performance	1.000	
	Information	.151	
Sig. (1-tailed)	Performance	.	
	Information	.003	.

Correlation is significant at 0.05 level (1-tailed)

**Customer Correlations Results**

Table 4.10 shows the Pearson correlation matrix for all variables of the study model. Numbers are Pearson correlation coefficients, which go from -1 to 1. The closer to 1 means strong correlation. A negative value indicates an inverse relationship. The correlation analysis of the study revealed that IS (r=.448, p=.000), a positive relationship on Performance of NKCC.

**Table 4.10 Customer Correlations Results**

		Performance	Information
Pearson Correlation	Performance	1.000	
	Information	.448	
Sig.(1-tailed)	Performance	.	
	Information	.000	.

Correlation is significant at 0.05 level of confidence (1-tailed)

**Supplier Model Summary**

The results on table 4.11 below displays computed correlation coefficient (R=0.151). Other statistics are (R<sup>2</sup>= 0.023), adjusted (R<sup>2</sup>= 0.020) and Standard Error of Estimate (0.78030). Durbin-Watson is also showed (2.062).

The coefficient of determination R<sup>2</sup> statistic is the proportion of variation (in the y-variable) that is explained by the regression model (on the x-variable). The values of R squared range from 0 to 1. Small values indicate that the model does not fit the data well. In this study, the results showed only 2.3 percent proportion of the variability in performance of NKCC. Conversely, that means that 97.7 percent of the variability in performance of NKCC is shared with other factors than those measured in the model.

**Table 4.11 Supplier Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of Estimate	Durbin-Watson
1	.151 <sup>a</sup>	.023	.020	.78030	2.062

a. Predictors: (Constant), Information

b. Dependent Variable: Performance

**Customer Model Summary**

The results on table 4.12 below shows computed correlation coefficient (r=0.448). Other statistics (R<sup>2</sup>= 0.201), are adjusted (R<sup>2</sup>= 0.198) and Standard Error of Estimate (0.62322). Durbin-Watson was also computed (1.410). For the customer respondents the results showed that only 44.8 percent of the variability in performance is shared in the model. Conversely, that means that 55.2% of the variability in performance of NKCC is shared with other factors than those measured in the model.

**Table 4.12 Customer Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of Estimate	Durbin-Watson
1	.448 <sup>a</sup>	.201	.198	.62322	1.410

a. Predictors: (Constant), Information

b. Dependent Variable: Performance

**Supplier ANOVA**

The output below on table 4.13 tests the significance of the correlation coefficient by analysis of variance (ANOVA). If the Sig. value shown next to the F-test value were 0.05, we would conclude that the correlation coefficient is significantly different from 0. That is, we would reject the H<sub>0</sub>, and conclude that there is a significant positive linear relationship between the two variables. In this case, r = .15.1 percent and is significant because Sig. = .005, and as p < .001).

**Table 4.13 Supplier ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.860	1	4.860	7.983	.005 <sup>b</sup>
	Residual	207.014	340	.609		
	Total	211.874	341			

a. Dependent Variable: Performance

b. Predictors: (Constant), Information

**Customer ANOVA<sup>a</sup>**

The output below on table 4.14 shows the Sig. value shown next to the F-test value were less than .05, we would conclude that the correlation coefficient is significantly different from 0. That is, we would reject the  $H_0$ , and conclude that there is a significant positive linear relationship between the two variables. In this case,  $r = .44.8$  percent and is significant because Sig. = .000, and as  $p < .001$ ).

**Table 4.14 Customer ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	30.464	1	30.464	78.435	.000 <sup>b</sup>
	Residual	121.182	312	.388		
	Total	151.646	313			

a. Dependent Variable: Performance

b. Predictors: (Constant), Information

**Supplier coefficients**

The next output on the table 4.15 below shows the coefficients for the regression equation. In this study, the y-intercept (Constant) is +2.938 and the slope (information) is +.116. Thus, in this study, the regression equation  $Y = \beta_0 + \beta_1 + \epsilon$ , can be explained as  $Y = 2.938. + 0.116x + 0.119$ . The equation states that performance of NKCC is linearly related to information sharing.

**4.15 Supplier Coefficients**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error				Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	2.938	.119		24.729	.000	2.704	3.171		
	Information	.116	.041	.151	2.825	.005	.035	.197	1.000	1.000

a. Dependent Variable: Performance

**Customer Coefficients**

The next output on the table 4.16 below shows the coefficients for the regression equation. In this study, the y-intercept (Constant) is +2.2.262 and the slope (information) is +.392. Thus, in this study, the regression equation  $Y = \beta_0 + \beta_1 + \epsilon$ , can be explained as  $Y = 2.262. + 0.392x + 0.158$ . The equation states that performance of NKCC is linearly related to information sharing.

**4.16 Customer Coefficients**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
	B	Std. Error				Lower Bound	Upper Bound	Tolerance	VIF
1 (Constant)	2.262	.158		14.271	.000	1.950	2.574		
Information	.392	.044	.448	8.856	.000	.305	.479	1.000	1.000

a. Dependent Variable: Performance

**5. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

The study sought to establish the influence of information sharing on Performance of NKCC. The study analyzed the influence of IS on Performance of NKCC.

Based on research findings on information sharing and performance of NKCC, the farmers the results were contradictory on firm information sharing. This result shows that although supply chain practitioners findings are positive on the aspects the suppliers and customer’s findings are at times contradicting which could means that the practitioners are giving positive views to cover for the firm’s weakness. It clearly shows that the firm’s form of information sharing has not influenced the farmers.

The study recommends that relevant information could be communicated to farmers in a compatible means to influence them. The firm should understand the demographic characteristics of the farmers for their communication to be effective. With regards to customers the firm could enhance their performance by putting more tracking orders and formalization of information sharing.

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