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## INFLUENCE OF COLLABORATIVE PLANNING ON PERFORMANCE OF PHARMACEUTICAL FIRMS IN KENYA

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### Abstract

**Purpose:** The purpose of this study was to establish the influence of collaborative planning on performance of pharmaceutical firms in Kenya

**Methodology:** This research adopted a descriptive research design. The target population of interest in this study were the 22 local pharmaceutical manufacturing and 149 importing firms that act as subsidiaries making a total of 171. The study sample was drawn from the list of 171 pharmaceutical firms, where various categories with the relevant information for the study were drawn. The study adopted a census sampling technique. Two questionnaires were administered to each firm to categories of people with relevant information about collaborative planning giving a total of 342. These included procurement officers, general managers, line managers or marketing managers. The data was analyzed using SPSS 22 version by making use of multiple regressions analysis which helped to generate a weighted estimation equation (OLS) that was used to predict values for dependent variable from the values of the independent variable.

**Results:** The correlation and regression results revealed that collaborative planning had a positive and significant relationship with performance of pharmaceutical firms. The null hypothesis was rejected which indicated that there was a significant relationship between collaborative planning and performance of pharmaceutical firms in Kenya.

**Recommendations:** The study recommends that management in pharmaceutical firms should promote and cultivate a culture which allows collaboration with their customers. This should be geared towards a model of Collaborative Planning Forecasting and Replenishment (CPFR) for successful supply relationships that enhance performance. This is because collaborative planning has been confirmed to have positive and significant effect on firm performance. The firms are therefore recommended to adopt collaborative planning through ways such as joint execution schedules, forecasting present and future needs, Replenishments, involving customers in joint project teams, involving them in new product development and planning as well as having an integrated IT systems. With this, the performance is deemed to improve.

**Keywords:** *Collaborative planning, performance, pharmaceutical firms*

## 1.0 INTRODUCTION

### 1.1 Background of the Study

Supply chain relationship is a form of exchange dependence between exchange members where all the parties are willing to align their processes for competitive advantage (Kathleen *et al.*, 2016). A relationship develops when one of the firms take the initiative and contact the other party (Hastings *et al.*, 2016). Market exchanges occur because all parties involved expect to benefit from the exchange (Ying-Pin, 2016). During this process, the firms learn about each other. Relationships become stronger and more productive over time, as buyer–supplier relationships are built up through legal, formal and informal exchange processes, and relation-specific investments (Hastings *et al.*, 2016).

According to Song *et al.*, (2016), the value created in the relationship is a construct embracing customer concepts, interaction response capacity, customer empowerment and customer value management. Once the other party responds and the interaction commences, both firms gradually make commitments based on the trust that develops (Hastings *et al.*, 2016; Ying-Pin, 2016). It may improve a firm’s performance and its customer-based relational performance. Its objectives are to increase profitability, revenue, and customer satisfaction (Sweeney Group, 2012). Customer relationship management (CRM) involves all of the corporate functions such as marketing, manufacturing, customer services, field sales, and field service required to contact customers directly or indirectly (Paul & Jongbok, 2012).

According to Gholamhossein *et al.*, (2015), The Pharmaceutical supply chains (PSC) represents the path through which essential pharmaceutical products are distributed to the end users (Ying & Liz, 2012), with the right quality, at the right place and at the right time (Shabaninejad *et al.*, 2014). Products are delivered to company’s warehouses, wholesale distributors, retail pharmacies, hospital pharmacy and finally to the end users (Mehralian *et al.*, 2012). It also includes expenditure of high cost and time in conducting clinical trials with low success rate in product discovery and clinical development, generic competition at the end of product patent life followed by high uncertainties in demands and capacity planning (Lainez *et al.*, 2012). In the Indian context, Mahajan *et al.* (2015) observed that the pharmaceutical industry has largely capitalized on its low cost production of generic drugs. It includes the internal chain such as patient care units, hospital storage and the external chain such as producers, purchasers and distributors (Mehralian *et al.*, 2012).

According to Porter and Lee (2013), Pharmaceutical chains and relationships are centered on competing branded medicines and exposed to complex interactions between various players such as government bodies, health-care providers and manufacturing firms (Goswami *et al.*, 2016). In the past, pharmaceutical firms did not adopt supply chain management concepts but today several factors are pressing pharmaceutical firms to change their traditional manners of conducting business (Ahmad *et al.*, 2012). This supply chain is more complex and different from other industry supply chains as it handles a diversity of items in widely varying quantities in response to the large number of diagnosis types and procedures (AbuKhoussa *et al.*, 2014), and also because it requires the participation of different stakeholders such as pharmaceutical manufacturers, wholesalers,

distributors, customers, information service providers and regulatory agencies (Rajesh *et al.*, 2016).

In Kenya most pharmaceutical firms act as distributors importing directly from manufacturers overseas, arrange shipment of goods from country of origin and customs clearance and handle the domestic sales of the products (Chopra & Meindl, 2013). It is highly fragmented pyramidal structure, characterized by poor relationships with a few manufacturers and importers or subsidiaries at the top and a large but undefined number of retailers at the base. The outcome of the highly distorted and fragmented commercial distribution chain is a market characterized by many low quality retailers (PSP4H, 2014). A wholesaler buys goods from different manufacturers, stocks them in warehouses, and resells them to retailers as one combined order under one invoice (Levy & Weitz, 2012). A retailer displays the goods at their pharmacy and sells directly to end users. It also provides technical advice and other services to customers where necessary. Distinction between the various types of intermediaries can be unclear as distributors or wholesalers may sell directly to end users as well while retailers can sell to other smaller retailers (Fowler & Goh, 2012).

According to SESRIC (2012), the global pharmaceutical industry has proved a rapid growth over the years and emerged as one of the fastest growing industries in the world. IMS The value of the global prescription drug market was estimated to be \$816bn in 2016 and is projected to grow to \$1.3 trillion by 2020, representing an annual growth rate of 4.9 percent. Several global demographic and economic trends are driving pharmaceutical consumption, including a rapidly aging world population and an associated rise in chronic diseases, increased urbanization and higher disposable incomes, greater government expenditure on healthcare and growing demand for more effective treatment (International trade administration (ITA) (2016) The volume of pharmaceutical industry has surged from USD 647 billion in 2005 to USD 875 billion in 2010, corresponding to an increase of 35.2%.

## 1.2 Statement of the Problem

The pharmaceutical industry play a major role in supporting the country's health sector ensuring medical and health continuum (Shabaninejad *et al.*, 2014). The goal of this supply chain is to assure a continuous flow of drugs to patients at optimal price, with minimal delays, few shortages, and with little room for error (Thani *et al.*, 2011). Pharmaceutical sales in Kenya reached a value of Ksh 73.34bn (USD750mn) in 2015 (BMI, 2016). While robust growth is forecast for pharmaceutical expenditure in Kenya, significant concerns exist with regard to Kenya's intellectual property environment with Anti-Counterfeiting and Product Protection Program (A-CAPPP, 2012), estimating counterfeit drugs infiltration into the Kenyan market to be 30% of drugs sold amounting to Ksh 22 billion losses annually (UNIDO, 2015).

According to (BMI, 2016), pharmaceutical firms have raised concern over medicines from non-legitimate questionable sources constituting 30% of drugs sold thus reduce their market share (PSP4H, 2014). According to world health organisation (WHO, 2014), the toll on public health has been on the rise due to resistance to some antibiotics contributing up to 40% deaths from MDRTB (MOH, 2015). In addition with pharmaceutical firms are losing Ksh 5 billion per annum

due to products that are expired, recalled, has damaged packaging, delivered incorrectly or ineffective that customers have lost confidence in thus shying away from purchasing. The detrimental effects on firms include; reduced sales revenue, reduced market share, dissatisfied customers, determent in innovation and growth and huge costs of over Ksh 3 billion to combat counterfeiting (A-CAPPP, 2012). Unable to operate in Kenyan market in 2016, 5% of the pharmaceutical firms closed doors and 2% downsized despite significant growth in the number of support institutions with healthcare facilities growing from 5000 in the 2007 to 6200 in 2015 representing 24% growth(MOH, 2016) and pharmaceutical retail outlets growing from 7000 in 2012 to 9000 in 2016 (PPB,2016).

According to private sector innovation program for Health (PSP4H, 2014), there are highly fragmented relationships between pharmaceutical firms and their customers in developing countries (Pule & Kalinzi, 2014).The net results of these, are huge losses of over Ksh 25 billion that have forced some firms to downsize and others to close down (UNIDO, 2012). Kenneth & Muli (2012) conducted a study on the Factors influencing the influx of counterfeit medicines in Kenya among small and medium enterprises. The study found out that legislation, popularity of a brand, pricing strategy and various perceived risks had influence on the influx of counterfeit medicines. This research sought to establish the influence collaborative planning on performance of pharmaceutical firms in Kenya, and make recommendations on how collaborative planning can be enhanced for better performance.

### **1.3 Study Objective**

The purpose of this study was to establish the influence of collaborative planning on performance of pharmaceutical firms in Kenya

## **2.0 LITERATURE REVIEW**

### **2.1 Systems Theory**

According to Senge (1990), system thinking theory calls for addressing various parts of a system from a holistic viewpoint and not in isolation of each other in tackling the problems in their entirety. The theory advocates for greater understanding of the problems or issues at hand through gauging patterns or the interrelationships that are at play among various entities of a system (Rubenstein et al., 2001). This theory is thus tailored toward systematically explicating the dynamics that characterize the SCM practices (Montano et al., 2001). The primacy of taking recourse to such an integrated approach is paramount as the lack of which would not ensure whether all the vital components are adequately looked into (Tsoukas, 1996; Schlange, 1995).

This theory supports collaborative planning by depicting the inter-organisational relationships as part of an interdependent system composed of various parts of a system. These systems are not in isolation from each other and jointly solve the problems that affect them. Collaborative planning will involve downstream and upstream approach to tackling issues that affect operations of partner organisations for competitive advantage and improved performance.

## 2.2 Empirical Literature Review

Hall, Skipper, Hazen and Hanna (2012) studied Inter-organizational IT use, cooperative attitude and inter organizational collaboration as antecedents to contingency planning effectiveness with the objective of testing proposed antecedents of contingency planning effectiveness in a supply chain setting. The study examined inter-organizational information technology (IT) use, inter-organizational collaboration, and cooperative attitude as antecedents to contingency planning effectiveness at the organization level were examined. A survey method was used to gather data from 103 participants involved in their respective organization's contingency planning and implementation processes. The findings suggested that inter-organizational collaboration, inter-organizational IT use, and cooperative attitude directly impact contingency planning effectiveness. Inter-organizational collaboration mediates the relationships between the other antecedents and contingency planning effectiveness.

Kumar and Nath Banerjee (2012) conducted a study on Collaboration in supply chain with the objective of framing collaboration in supply chain as a hierarchical reflective construct in India. The objective of the survey was to measure various parameters of the collaborative constructs. They used a survey design to measure different components of supply chain collaboration (SCC) for the purpose of hierarchical model and hypothesis testing based the reviews of the supply chain collaboration (SCC) literature and an academic expert.

The findings captured the overlap of various aspects of collaboration as a consequence of hierarchical structure of collaboration in which aspects lower in the hierarchy are correlated and give rise to broader dimensions at the higher level. The collaboration reflected four dimensions, namely, collaborative culture (CC), joint planning (JP), resource sharing (RS), and joint problem solving and performance measurement (JPSPM) which form second order in the hierarchy of collaboration. CC reflected individuals and groups attribute (IGA) and strength of relationships. JP reflects joint planning for executing schedule (JPES) and joint planning for increasing market share (JPIMS) and RS reflects market based information Sharing (MBIS) and internal resource sharing (IRS). They concluded that Collaborative relationship result in improved performance in terms of improved visibility, higher service levels, increased flexibility, greater end-customer satisfaction, and reduced cycle time.

Farhad *et al.*, (2015) investigated the framework for Collaborative Planning, Forecasting and Replenishment (CPFR) with the objective of identifying and analyzing the main constructs for successful implementation of CPFR. The objective was to seek answers to the question of; what are the main constructs and efficient framework for successful implementation of CPFR and to review the scope and value of CPFR using a devised state-of-the-art taxonomy for the classification of selected bibliographical references and finally to develop a conceptual framework by identifying areas which need more research. They employed a systematic literature review based on a total of 93 papers published from 1998 to 2013 on CPFR to address the identified gap. Research findings indicated that collaborative planning (CP) is a fundamental part of supply chain management. CP is the first step of CPFR with two fundamental stages: front-end agreement and joint business plans. The study emphasized the importance of IT infrastructure for effective CP

with suppliers and customers, however with the caveat that “technology cannot be the complete solution”. They concluded that there is a strong connection between CP with decision making and execution planning and thus successful supply chains need to adopt planning, decision making and execution as key elements of collaboration.

### 3.0 RESEARCH METHODOLOGY

This research adopted a descriptive research design. The target population of interest in this study were the 22 local pharmaceutical manufacturing and 149 importing firms that act as subsidiaries making a total of 171. The study sample was drawn from the list of 171 pharmaceutical firms, where various categories with the relevant information for the study were drawn. The study adopted a census sampling technique where all items in the population were completely enumerated. Two questionnaires were administered to each firm to categories of people with relevant information about collaborative planning giving a total of 342. These included procurement officers, general managers, line managers or marketing managers. The data was analyzed using SPSS 22 version by making use of multiple regressions analysis which helped to generate a weighted estimation equation (OLS) that was used to predict values for dependent variable from the values of the dependent variable.

## 4.0 RESULTS

### 4.1 Factorability Test

#### 4.1.1 Measure of Sampling Adequacy

To examine whether the data collected was adequate and appropriate for inferential statistical tests such as the factor analysis, multiple linear regression analysis and other statistical tests, two main tests were performed namely; Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett’s Test of Sphericity. For a data set to be regarded as adequate and appropriate for statistical analysis, the value of KMO should be greater than 0.5 (Field, 2000). The Kaiser-Meyer-Olkin Measure of Sampling Adequacy results for capital adequacy are represented on. The study results showed that the KMO statistic was 0.723 which was significantly high; that is greater than the critical level of significance of the test which was set at 0.5 (Field, 2000). In addition to the KMO test, the Bartlett’s test of sphericity was also highly significant (Chi-Square=222.978 with 28 degree of freedom, at  $p < 0.05$ ). These results provide an excellent justification to conduct for further statistical analysis.

**Table 1: Factorability Test**

<b>KMO and Bartlett's Test</b>		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.723
Bartlett's Test of Sphericity	Approx. Chi-Square	222.978
	df	28
	Sig.	0

#### 4.1.2 Communalities for Collaborative Planning

**Table 2: Collaborative Planning Component Matrix**

<b>Components</b>	<b>Initial</b>	<b>Extraction</b>
Our firm collaborate with customers in new product development	1.000	.765
We involve customers in forecasting	1.000	.293
We have joint execution schedules	1.000	.580
We have collaboratively installed a common IT system	1.000	.425
Our firm involve customers in stock replenishments	1.000	.118
We have joint project teams with customers	1.000	.472
We involve customers in planning marketing activities	1.000	.598
Our firm share financial resources	1.000	.524

#### 4.1.3 Reliability Test

The study tested reliability for collaborative planning using Cronbach's Alpha Test of Reliability. The Cronbach's Alpha reliability coefficient estimates internal consistency by determining how all items on a test relate to all other items and to the total test-internal coherence of data. The reliability concept is expressed as a coefficient between 0.0 and 1.00, the higher the coefficient, the more reliable is the test. According to Kaiser (1974), factor-loading values that are greater than 0.4 should be accepted and values below 0.5 should lead to correction of more data to help researcher to determine the values to include. Values between 0.5 and 0.7 are mediocre, values between 0.7 and 0.8 are good, values between 0.8 and 0.9 are great, and values above 0.9 are superb.

**Table 3: Reliability results**

	<b>Cronbach's Alpha</b>
Our firm collaborate with customers in new product development	0.744
We involve customers in forecasting	0.791
We have joint execution schedules	0.775
We have collaboratively installed a common IT system	0.791
Our firm involve customers in stock replenishments	0.813
We have joint project teams with customers	0.799
We involve customers in planning marketing activities	0.833
Our firm share financial resources	0.825

According to Kaiser (1974), factor-loading values that are greater than 0.4 should be accepted and values below 0.5 should lead to correction of more data to help researcher to determine the values to include. Values between 0.5 and 0.7 are mediocre, values between 0.7 and 0.8 are good, values



between 0.8 and 0.9 are great, and values above 0.9 are superb. Factor analysis was conducted on statements regarding Collaborative Planning and every statement was above 0.5 hence presenting a good justification for further modelling.

#### 4.1.4 Total Variance Explained

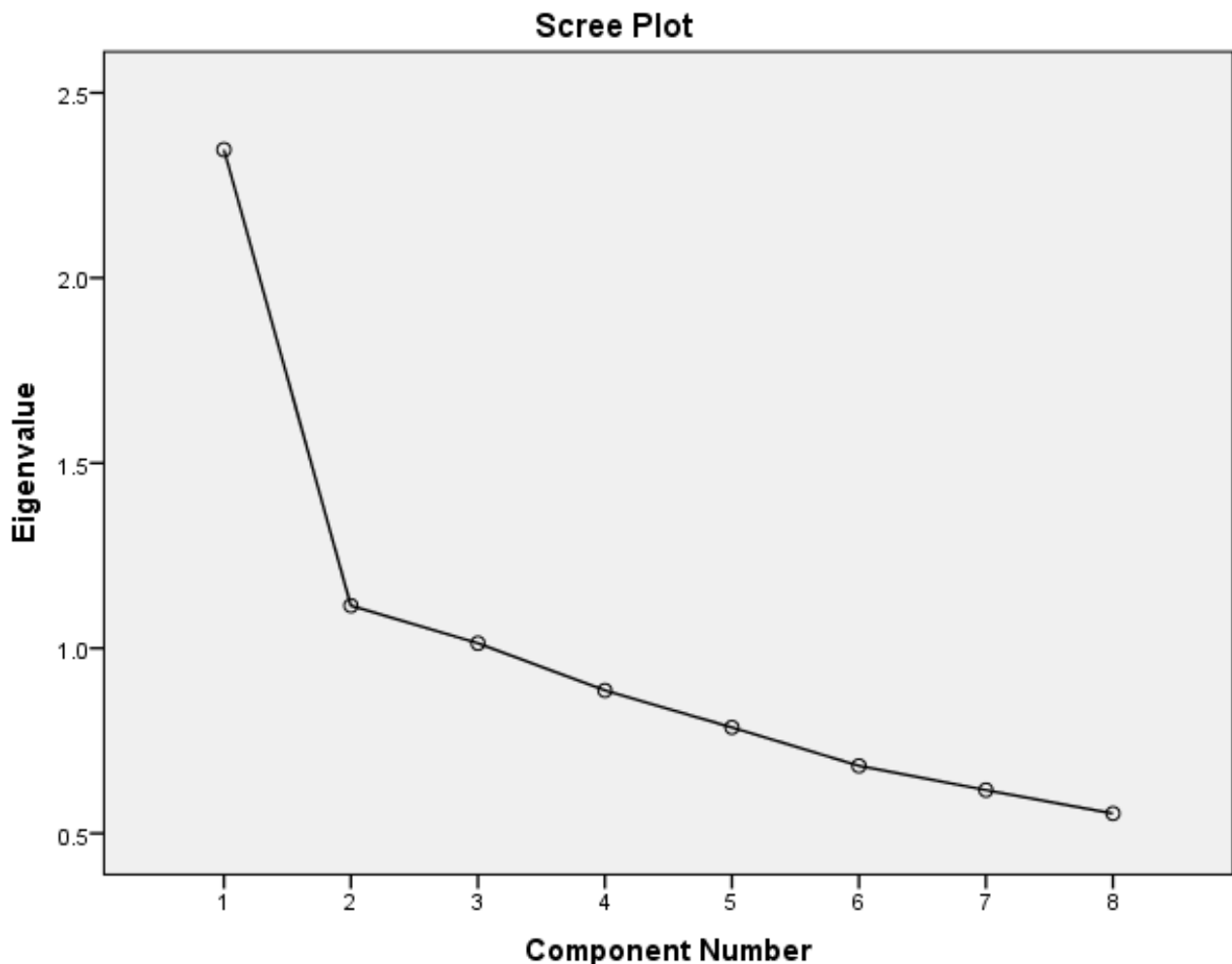
The researcher rotated the collaborative planning components and made a further analysis using rotation Sums of Squared Loadings values. Rotation Sums of Squared Loadings values in Table 4. represents the distribution of the variance after the varimax rotation. The varimax rotation tries to maximize the variance of the collaborative planning factors so the total amount of variance accounted for was redistributed over the three extracted factors. Varimax rotation considers only the variables whose eigenvalues are more than 1.0. The results therefore mean that the two extracted factors out of the seven components explained 55.936% of the total variations. This implies that the 8 statement of collaborative planning can be grouped into 3 factors.

**Table 4: Total Variance Results**

Component	Initial Eigenvalues		Cumulative %	Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance		Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.347	29.331	29.331	2.347	29.331	29.331	1.646	4	20.574
2	1.115	13.937	43.269	1.115	13.937	43.269	1.616	6	40.78
3	1.013	12.668	55.936	1.013	12.668	55.936	1.213	6	55.936
4	0.886	11.077	67.013						
5	0.786	9.827	76.840						
6	0.682	8.528	85.368						
7	0.617	7.711	93.079						
8	0.554	6.921	100						

#### 4.1.5 Scree Plot

The study obtained scree test results by plotting the latent roots, eigenvalue, against the factors in order of extraction. From the second factor on, the line is almost flat, meaning the each successive factor is accounting for smaller and smaller amounts of the total variance. The Distribution Results for Collaborative Planning are presented in Figure 1.



**Figure 1: Scree plot for Collaborative Planning**

#### **4.2 Correlation Analysis**

A correlation analysis was performed between collaborative planning and performance of pharmaceutical firms in Kenya. The results in Table 5 show the correlation between collaborative planning and performance of pharmaceutical firms. The results shows that new product development has a positive and significant relationship with performance of the pharmaceutical firms ( $r= 0.177$ ,  $p=0.03$ ). These results matched with that of Hall *et al.*, (2012) whose findings suggested that inter-organizational collaboration, inter-organizational IT use, and cooperative attitude directly impacted contingency planning effectiveness.

Further, there is positive and significant relationship between joint execution schedules and performance of the pharmaceutical firms ( $r=0.138$ ,  $p=0.004$ ). These results are consistent with the

findings by Kamar (1996) who found that collaboration with customers in new product development and joint execution schedules are positively associated with great performance of the pharmaceutical firms. Additionally, the results revealed that common IT system is positively and significantly associated with performance of the pharmaceutical firms ( $r=0.067$ ,  $p=0.007$ ) while joint project teams are also positively and significantly associated with performance of the pharmaceutical firms ( $r= 0.146$ ,  $p=0.000$ ). These results were in line with that of Kumar (2014) who found that shared IT system, team projects with customers, and involving customers in forecasting were positively correlated with the performance of retailing firms.

Further, the results showed that there is positive and significant relationship between involving customers in planning marketing activities and performance of the pharmaceutical firms ( $r=0.127$ ,  $p= 0.002$ ). These results were similar to those of Hall *et al* (2016) whose study found that Inter-organizational collaboration mediates the relationships between the other antecedents and contingency planning effectiveness. Finally, the study also revealed that sharing financial resources had positive and insignificant relationship with performance of the pharmaceutical firms ( $r=0.114$ ,  $p=0.061$ ). These results were consistent with that of Eksoz (2014) who found out that involving customers in planning marketing activities had a positive influence on performance of the pharmaceutical firms.

**Table 5: Correlation Results for Collaborative Planning**

		Performance	New Product development	joint execution schedules	Common it system	Joint project teams	Planning marketing activities	Financial resources
Performance	Pearson Correlation Sig. (2-tailed)	1.000						
new product development	Pearson Correlation Sig. (2-tailed)	0.177**	1.000					
joint execution schedules	Pearson Correlation Sig. (2-tailed)	0.138**	0.092	1.000				
common IT system	Pearson Correlation Sig. (2-tailed)	0.067**	0.114	.245**	1.000			
joint project teams	Pearson Correlation Sig. (2-tailed)	0.146**	.198**	.253**	.238**	1.000		
planning marketing activities	Pearson Correlation Sig. (2-tailed)	0.127	-0.008	0.095	.191**	.208**	1.000	
		0.002**	0.893	0.121	0.002	0.001		

financial resources	Pearson Correlation	0.114**	0.042	0.243*	.234**	0.253**	0.146*	1.000
	Sig. (2-tailed)	0.061	0.488	0.000	0.000	0.000	0.017	

\*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).

### 4.3 Regression Analysis

The objective of the study was to establish the influence of collaborative planning on performance of pharmaceutical firms in Kenya. Regression analysis was used to examine whether collaborative planning can be used to explain performance of pharmaceutical firms in Kenya. Collaborative planning was found to be satisfactory in explaining performance of pharmaceutical firms as supported by coefficient of determination also known as the  $R^2$  of 32.3%. This means that collaborative planning explain 32.3% of the variations in the dependent variable which is performance of pharmaceutical firms.

**Table 6: Model Fitness for Collaborative Planning**

Variables	R	R Square	Adjusted R Square	Std. Error of the Estimate
Coefficients	.569	.323	.310	.5013

Further, the results revealed that collaborative planning is a good predictor of performance of pharmaceutical firms as supported by an F statistic of 42.628 and the reported p value (0.000) which was less than the conventional probability of 0.05 significance level.

**Table 7: ANOVA for Collaborative Planning**

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	3.962	6	.660	42.628	.000 <sup>b</sup>
Residual	65.829	262	.251		
Total	69.791	268			

The null hypothesis that collaborative planning does not affect performance of pharmaceutical firms in Kenya was tested by using multiple linear regression. The acceptance/rejection criteria was that, if the p value is greater than 0.05, the null hypothesis is not rejected but if it's less than 0.05, the null hypothesis fails to be accepted. The null hypothesis was that there is no significant relationship between collaborative planning and performance of pharmaceutical firms in Kenya. Results in Table 7 shows that the p-value was  $0.000 < 0.05$ . The null hypothesis was rejected, indicating there is a significant relationship between collaborative planning and performance of

pharmaceutical firms in Kenya. These findings agreed with that of Menguc, Auh and Yannopoulos (2013) who found that there is a significant and positive relationship between collaborative planning and performance of the pharmaceutical firms.

The regression of coefficients showed that new product development and performance of pharmaceutical firms have a positive and significant relationship ( $\beta = 0.088$ ,  $p=0.000$ ) which is in agreement with Montoya-Torres et al (2014). Further, joint execution schedules and performance of pharmaceutical firms have a positive and significant relationship ( $\beta = 0.53$ ,  $p=0.001$ ). Common IT system and performance of pharmaceutical firms have a positive and significant relationship ( $\beta = 0.22$ ,  $p=0.000$ ) while joint project teams and performance of pharmaceutical firms are positively and significantly related ( $\beta = 0.44$ ,  $p=0.007$ ). These findings are supported by Kumar (2016) who found that joint projects are positively and significantly associated with the performance of pharmaceutical firms. In addition, Planning marketing activities and performance of pharmaceutical firms was found to have positive and significant relationship ( $\beta = 0.05$ ,  $p= 0.003$ ). This is in line with Menguc *et al* (2013) whose findings revealed positive and significant relationship between planning marketing activities and performance of pharmaceutical firms. Finally the findings suggested that sharing financial resources and performance of pharmaceutical firms have a positive and insignificant relationship ( $\beta = 0.34$ ,  $p=0.284$ ) which is supported by Kuma (2016) who in his study concluded that sharing resources and finances have a positive and significant impact on performance of the pharmaceutical firms.

**Table 8: Regression Results for collaborative planning**

	$\beta$	Std. Error	t	Sig.
(Constant)	3.132	0.231	13.558	0
New product development	0.088	0.036	2.444	0.000
Joint execution schedules	0.53	0.037	14.324	0.000
Common IT system	0.22	0.031	7.097	0.001
Joint project teams	0.44	0.036	12.222	0.003
Planning marketing activities	0.05	0.031	1.613	0.003
Our firm share financial resources	0.34	0.031	10.968	0.284

Regression model:

$$Y_1 = 3.132 + 0.088 \text{ NP} + 0.53 \text{ JE} + 0.22 \text{ CIT} + 0.44 \text{ JP} + 0.05 \text{ PM} + \varepsilon$$

Where  $Y_1$  = Performance, CR- New Product Development, JE- Joint Execution Schedules, CIT- Common IT Systems, JP- Joint Project Teams, PM- Planning Marketing Activities and  $\varepsilon$  - Error term

## **5.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

### **5.1 Summary of Findings**

The purpose of the study was to examine how collaborative planning influences the performance of pharmaceutical firms in Kenya. Most of the firms have integrated collaborative planning methods in their operations. Joint execution schedules in pharmaceutical company enhanced the performance of the firm. Most pharmaceutical firms had adopted joint project teams with customers to identify and track customers change of preferences. Additionally, most of the firms involved their customers in planning marketing activities and in new product development. These strategies have enhanced the performance of the firms by tapping and filling the immediate and most desired needs of the customers. Installing common IT system ensures that the customers are familiar and comfortable with use of the systems and also understand the risk and benefits of the system which translates to more customer loyalty and consequently improved performance margins.

The correlation and regression results revealed that collaborative planning had a positive and significant relationship with performance of pharmaceutical firms. The null hypothesis was rejected indicating that there was a significant relationship between collaborative planning and performance of pharmaceutical firms in Kenya. Given the importance of strategic planning to any company sustainability and performance, collaborative planning is an important and significant aspect which should be embedded into the business across all departments, business process, products and services. The board and management of pharmaceutical must have a collaborative planning policies and strategies in order to meet the performance targets.

### **5.2 Conclusion**

The study concluded that collaborative planning has a positive and significant effect on performance of the pharmaceutical firms in Kenya. The involvement of customers in planning and establishing company strategies in conjunction with collaborative implementation of the plans such as involving customers in marketing activities enhances the performance of the firms. In addition, the company's customer involvements in their daily activities and business continuity plans are key to the continued operations in offering service to their customers and hence improved performance.

### **5.3 Recommendations**

The study recommends that management in pharmaceutical firms should promote and cultivate a culture which allows collaboration with their customers. This should be geared towards a model of Collaborative Planning Forecasting and Replenishment (CPFR) for successful supply relationships that enhance performance. This is because collaborative planning has been confirmed to have positive and significant effect on firm performance. The firms are therefore recommended to adopt collaborative planning through ways such as joint execution schedules, forecasting present and future needs, Replenishments, involving customers in joint project teams, involving them in new product development and planning as well as having an integrated IT systems. With this, the performance is deemed to improve

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