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RESEARCH ARTICLE

ROLE OF COLLABORATIVE PLANNING, FORECASTING & REPLENISHMENT ON HOTEL PERFORMANCE AS MEDIATED BY COOPERATIVE BEHAVIOUR: A SURVEY OF THE KENYAN HOSPITALITY INDUSTRY

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ABSTRACT

Collaborative Planning, Forecasting & Replenishment (CPFR) has of late been the holy grail of supply chain collaboration. Its role in achieving exemplary performance of supply chains has been widely documented. This study sought to find out the role of CPFR on hotel performance when the relationship was mediated by cooperative behaviour. A survey design was employed where proportionate stratified sampling was used to select 50 out of 57 town hotels. Data was collected through the use of questionnaires as well interview guides to the procurement\supply chain departments of these hotels. Logarithmic transformations were used in conjunction with multiple regression analysis to determine the relationship between CPFR, cooperative behaviour and hotel performance. With respect to CPFR, the study unsurprisingly concludes that this collaborative practice is statistically significant in predicting hotel performance. Hotels in the industry should implement this practice to better performance. Cooperative behaviour (trust and attitude) was found not to have a significant influence on hotel performance when it mediated the relationship. Therefore it can be deduced that CPFR on its own significantly improves operational performance. This performance is in most cases through the leveraging of information technologies such as internet based CPFR solutions, tracking and reporting of performance against indicators as well as liaison devices activated to align different supply network activities. Through quadrant analysis that is based on the BCG matrix, the study recommends that sales forecasting should be jointly done with key suppliers. This is a primary priority area that is most important but has scored low in terms of satisfaction. The hotels should invest in this as a priority in order to improve satisfaction with a higher level.

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INTRODUCTION

It is with no doubt that a myriad of factors have of late conspired against the Kenyan tourism industry. Top of the list is the assault on the sector by the runaway terrorism acts throughout the year 2013 and largely 2014 by the radical militant group Al Shabaab. Despite this challenging environment, it is all not gloom and doom as recent developments such as the just concluded Global Entrepreneurship Summit (GES) 2015 held in Nairobi and attended by the President of the United States (POTUS) Barrack Obama served to raise Kenya's profile in the International scene. The World Bank has also raised Kenya's economic growth forecasts for 2015 from an earlier projection of 4.7% to 6 %, with expansion pegged at 6.6 percent in 2016 and 7 % the following year (Malingha, 2015). As the macro environment shapes up, hotels have to put in place processes as well as practices to take advantage of the promising scenario. Could the answer to performance lie in supply chain collaboration? Today, end customers give credit only to companies that efficiently achieve the "Perfect Order" – the right goods, at the right time, to the right place, with proper invoicing (Malone, 2003).

Collaborative supply chain practices in the Kenyan hospitality industry have long existed but rather in a less structured and formal manner. Industry players have continuously

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collaborated some for as long as twenty five years. The general feeling is that collaboration is something good and is laden with substantial benefits. As the business environment becomes more complex, organizations recognize that many benefits can be obtained from closer, long-term relationships (Ganesan, 1994). CPFR denotes Collaborative Planning Forecasting and Replenishment (CPFR Workgroup 2002a,b). This abbreviation is used to identify a nine-step approach which provides volunteer standards, protocols, guidelines, etc. required to exchange sales and order forecasts (on a web-based platform) between trading partners (conventionally identified as the buyer and seller) belonging to the same supply chain. A recent study by AMA Research shows that supply chain collaboration can add as much as three percentage points to profit margins for all types of supply chain players. Initial results from various studies indicate that CPFR has a substantial impact on service levels and costs (see for example, Hill, 1999; Williams, 1999; Butler, 1999; Parks, 2000; Abend, 2000). CPFR further brings with it the promise of higher fill rates while lowering inventory (Hill, 1999). The foregoing definition of CPFR conjures a picture of an extremely complex collaborative supply chain practice backed up by numerous meetings and technologies to boot. The reality is CPFR is not a reserve of large multinationals but can be implemented on a small scale in a number of environments. A major difference between CPFR and other solutions models, such as Efficient Customer Response (ECR), is that the other models require critical mass (participations of many buyers and sellers) before any benefits are realized. CPFR, however, enables a buyer to improve performance by just having a collaborative relationship with only one vendor. In Kenya, when for example Falcon Heights Hotel out books its excess clients at Mt. Kenya Safari Lodge, this is as a result of collaborative planning. However, few authors, notably Abade (2011) have attempted to explore this area within the Kenyan context. In as much as CPFR has received widespread approval owing to its various documented benefits, and successful case studies, its role in the performance of hotels has not been empirically determined.

Collaborative Supply chain in Kenya

A collaborative supply chain means that two or more independent companies work jointly to plan and execute supply chain operations with greater success than when acting in isolation (Simatupang & Sridharan, 2002). Therefore, collaboration, in the context of supply chain, means sharing commitment, trust and respect, skills and knowledge, and intellectual agility between supply chain partners (Barratt, 2004).

In Kenya, the concept of collaborative supply chain is not entirely new. Abade (2011) in a study entitled*, A survey of contract manufacturing as a collaborative supply chain process: Case study of selected firms in Kenya* arrived at the conclusion that Kenya rates highly as an off-shore destination to consider when seeking a contract manufacturing relationship. It also determined that contract manufacturing as a collaborative supply chain practice is a profitable venture as revealed with benefits, among them being speed to market for the finished goods for the contracting organization, business profitability and use of available capacity by the local organization offering the service with the overall contribution towards Kenya's development.

Kenyan Hospitality Industry

According to Ottenbacher, Harrington and Parsa (2009), the hospitality industry includes Lodging (Hotels, Motels), Food service (Restaurants, Caterings), Leisure (Vacations, Parks, Sightseeing, and hiking), Conventions (Meetings, Trade shows), Travel (pleasure and business) and attractions (fairs, gatherings, shows). At an average of 1.5 million tourist arrivals per year, Kenya's global market share stands at 0.17% of the global market (Government of Kenya [GoK], 2013; United Nations World Tourism Organization [UNWTO], 2012). It is Kenya's second foreign exchange earner after tea and employs 3 million people, 500,000 directly and the rest being suppliers (Nabukewa & Mgidu, 2015). Kenya's major tourism activities are safari and beach holidays, which are spatially restricted to key tourism destination areas including the coast as well as business, cultural and conference tourism. In the hospitality industry, collaboration may assume different forms but generally collaboration to ensure performance is usually in the areas of production where the players determine what products and services are needed by the market and by when, in the area of inventory where the players collaborate to determine the level of inventory that is maintained by the supply chain partners in the form of raw, semi – finished and processed material, in the area of information sharing where timely and accurate information holds the promise to better decision making.

Mehmetoglu and Altinay (2006) observe that the hospitality environment has gradually become more turbulent because of a shift in the complex of variations in customer demand and purchasing behavior. Managers have long acknowledged the importance of getting close to their key customers. Now that this logic has extended upstream as well, it is also important to forge close ties to one's key suppliers (Helper, 1991). To be effective in matching demand with supply, manufacturers, suppliers and other organizations need to collaborate in the supply chain. A growing body of literature suggests that a number of companies are beginning to reap-off significant benefits from their collaborative initiatives (Narasimhan and Jayaram, 1998;Shin *et al*., 2000). For example Hewlett-Packard (HP), for instance, initiated collaboration with one of its major resellers (Callioni & Billington, 2001). These collaborative efforts, which focused on co-managed inventory by considering different levels of demand uncertainty, enabled both parties to improve fill rate, increase inventory turnover, and enhance sales. Similarly, Wal-Mart collaborated in demand planning and replenishment with its major suppliers to increase inventory turns, reduce inventory costs, reduce storage and handling costs, and improve retail sales (Parks, 1999).

Literature Review

Theoretical Framework

Resource-based theory of the firm

This study adopts the resource based view (RBV) theory which was introduced by Wernefrlt (1984) and Barney (1991). The

theory holds that organizational performance is determined by the manner in which firms deploy , manage and position their internal resources and capabilities. These resources need to be invaluable, rare and imperfectly imitable and not substitutable.

This theory anchors the study as it predicts that certain types of resources, including collaborative relationships between hotels in the Kenyan hospitality industry and their suppliers as well as other resources owned and controlled by firms have the potential and promise to generate competitive and eventually superior firm performance. Collaborative relations between the hotels and their suppliers are viewed as resources that can be creatively exploited to achieve premier performance. According to Ni (2006), viewing relationships as resources satisfies all four resource criteria in the resource-based view perspective, namely (Barney, 1991): value; rareness; uniqueness (inimitability); and non-substitutability. From the perspective of RBT, long-term relationships founded on a win-win premise with a core group of suppliers can lead to a stronger sustainable competitive advantage than those based on a bid-buy system (Harrison & St John, 1996; Lambert, Stock, & Elram**,** 1998). The theory further provides guidelines for hotels in the Kenyan hospitality industry by noting that for them to achieve superior performance, they have to make their collaborative relationships have value, rareness, uniqueness and non substitutability. That is to say that a firm's worldwide performance is dependent on the fit between its intangible asset portfolio, foreign market entry strategies, partner relationships, and worldwide organizational structure. Trust among partners is essential for a win-win relationship. It is defined as the expectation that partners to an exchange will not act in an opportunistic manner even if there are short-term incentives to do so (Chiles & McMackin, 1996). Trust is also earned over time evolving slowly as the result of a successful history of performance between the partners (Liedtka, 1996). RBT research shows that collaboration founded on trust enables firms to accumulate resources that are rare, valuable, hard to imitate, and have no readily available substitute (Dyer & Singh, 1998). According to Resource Based proponents, it is much more feasible to exploit external opportunities using existing resources in a new way rather than trying to acquire new skills for each different opportunity. In RBV model, resources are given the major role in helping companies to achieve higher organizational performance. There are two types of resources: tangible and intangible. Tangible assets are physical things. Land, buildings, machinery, equipment and capital. Physical resources can easily be bought in the market so they confer little advantage to the companies in the long run because rivals can soon acquire the identical assets. Intangible assets are everything else that have no physical presence but can still be owned by the company. Intangible resources usually stay within a company and are the main source of sustainable competitive advantage.

Collaborative supply chain partnerships such as these support the development of flexibility, responsiveness, and low-cost/low-volume manufacturing skills (Goldhar & Lei, 1991). They also enhance access to complementary assets and technology which helps firms to commercialize core competencies (Teece, 1992).

Organizations must develop an integrated set of performance metrics and information linkages from factory nodes and other points in the supply chain if they are to achieve a sustainable competitive advantage (Goldhar and Lei, 1991; Lengnick-Hall, 1998). Information flow is a stepwise process between links in the supply chain; and every time information is exchanged there is a risk of error or an increase in cycle times. Compatible information technology among supply chain members enhances communication, reduces risk and supports the efficient transfer of information (Henriott, 1999; Mariotti, 1999). The importance of efficient information transfer was reaffirmed by the Automotive Action Group when they observed that materials information sent to third- and fourth-tier suppliers often took four to six weeks to arrive and, when it did arrive, it was often distorted (Henriott, 1999). From the perspective of RBT, one can see that an efficient flow of information, trust, and a willingness to collaborate, support the development of a sustainable competitive advantage.

Collaborative Processes

A recent review (Van der Vaart & Van Donk, 2008) lists over 20 different supply chain integration (SCI) constructs: some seem to be more tangible, operational practices, others seem to be more strategic, or seem to enable the implementation of the more tangible SCI practices. So far, little is known if and how these different aspects of integration (practices and enablers) are related.

Min *et al*. (2005) point out that collaborative processes include information sharing, joint planning, joint problem solving, joint performance measurement, and the leveraging of resources and skills. Researchers have highlighted the multidimensional nature of collaboration that goes beyond the exchange of information. Collaborative practices should also incorporate joint decision-making and the alignment of incentives (Simatupang & Sridharan, 2002, 2005).

Research Objective

To describe the role of CPFR in the performance of hotels in the Kenyan hospitality industry.

Hypothesis

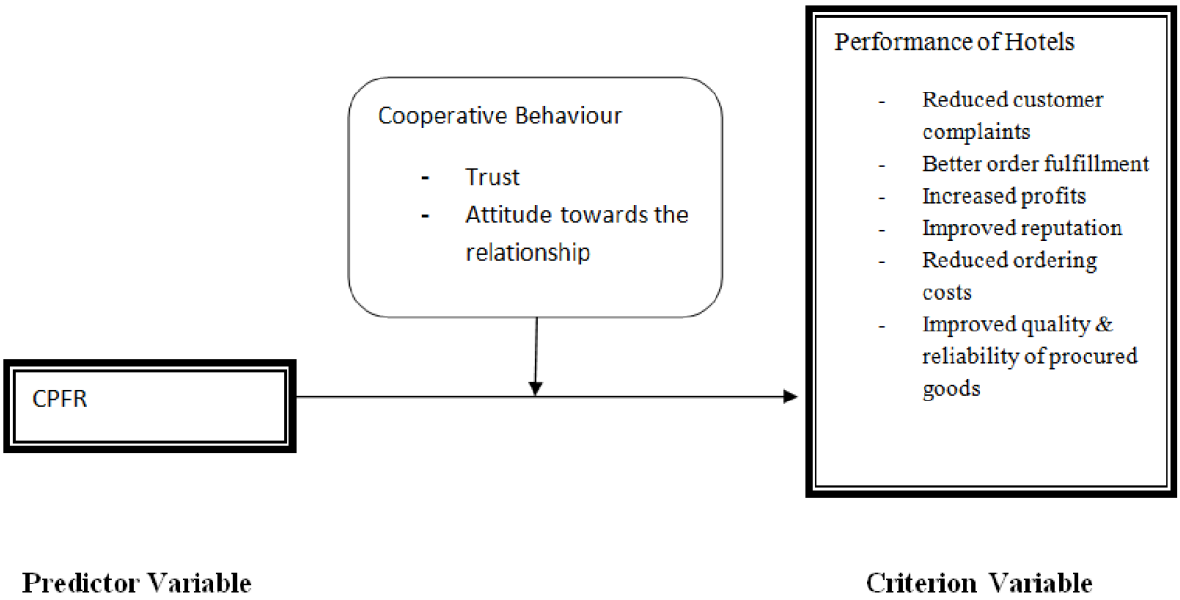
This research study was guided by the following hypothesis
H_O: Collaborative planning, forecasting & replenishment in collaborative supply chain relationships does not significantly influence the performance of hotels in the Kenyan hospitality industry.

H_A:Collaborative planning, forecasting & replenishment in collaborative supply chain relationships significantly influences the performance of hotels in the Kenyan hospitality industry.

Collaborative Planning, forecasting and Replenishment

In retailing and FMCG, supply-chain collaboration has mainly taken the form of practices such as continuous replenishment program (CRP), vendor managed inventory (VMI) and collaborative planning, forecasting and replenishment (CPFR).

Conceptual Framework



Predictor Variable **Criterion Variable**

CPFR was originally known as collaborative forecasting and replenishment (CFaR).VMI is a technique developed in the mid 1980s, whereby the manufacturer (supplier) has the sole responsibility for managing the customer's inventory policy, including the replenishment process, based on the variation of stock level in the customer's main warehouse or distribution centre (Blatherwick, 1998). CRP moves one step ahead of VMI and reveals demand from the retailers' stores. The inventory policy is then based on the sales forecast, built from historical demand data and no longer purely based on the variations of inventory levels at the customers' main stock-holding facility (Andraski, 1994).

Collaborative planning, forecasting and replenishment (CPFR) can be seen as an evolution from VMI and CRP, addressing not only replenishment but also joint demand forecasting and promotions planning, focusing on promotions and special-line items (Holmstro¨m *et al*., 2002). CPFR refers to 'the collaborations where two or more parties in the supply chain jointly plan a number of promotional activities and work out synchronized forecast, on the basis of which the production and replenishment processes are determined' (Larsen *et al*., 2003).
It has been suggested that prior to the emergence of CPFR organizations were practicing less advanced forms of collaboration in the form of vendor managed inventory (VMI) and continuous replenishment programmes (CRP) (Ireland & Bruce, 2000; Barratt, 2002). Several authors describe the pilot project between Wal-Mart, Warner-Lambert, Benchmarking partners, SAP, and Manugistics in 1995 as the first CPFR programme ever implemented (Cooke, 1998).

Despite the existence of this process model that suggests how to design and implement CPFR, some authors (ECR Europe 2001, 2002, Larsen *et al*. 2003, Seifert 2003) maintain that in practice, CPFR can take a number of different forms. First, the type of collaboration among companies involved in CPFR can vary significantly. According to Larsen *et al*. (2003), for instance, the level of integration (e.g. the degree of discussion, data exchanged, plan synchronization, etc.) or the business processes involved in the CPFR collaboration can differ. In addition, by comparing CPFR cases that exist in the literature, it emerges that different types of Information and Communication Technologies (ICTs) and inter-firm coordination mechanisms can be used to support CPFR. The inter-firm coordination mechanisms can take the form of personnel dedicated to customer-supplier interfaces.

CPFR is based on extended information sharing between retailer and supplier, including point-of-sales (POS) data, forecasts and promotion plans and usually focuses on the demand side as opposed to the supply side. As we move from VMI/CRP to more advanced forms of collaboration, such as CPFR, the amount of exchanged information increases and so do the requirements towards the underlying technology infrastructure. Some of the most sophisticated technologies adopted to support CPFR include the Internet-based CPFR solutions (Attaran and Attaran 2002a, b, Sparks and Wagner 2003). According to Seifert (2003), these include: Web-based collaboration, designed to allow process and information sharing among multiple trading partners, Event management and analysis, allowing participants to engage in exception management, Tracking and reporting, providing the capability to analyze performance against key indicators and to generate management reports.

CPFR has been for long been practiced by various successful companies such as Wal-Mart which had an inventory equivalent of only 29 days of sales in 2010. Wal-Mart has experienced significant successes in this regard as a result of this joint initiative with P&G, (Chopra & Meindl,2001). Moreover Dell, Toyota, Tesco as well as in vegetable supply chains in Ho Chi Minh City, Viet Nam, have leveraged significantly on this practice. Jean-Joseph Cadilhon *et al*.(2005)

Ho Chi Minh City (HCMC) is a metropolis of 8 million inhabitants in the South of Viet Nam. With the strong economic growth of the last decade, many HCMC consumers have diversified their diets to incorporate more fresh produce and meat in their meals. The transport in these chains is better but still un-refrigerated, so quality and waste remain significant issues. Good communication between retailers, collectors and growers , most notably sharing information on market supply and demand, and in the form of supplier training on safe agricultural practices – is key to making consistently available high quality, "safe" vegetables to the growing number of supermarket and cash-and-carry shoppers. Traders express a preference for dealing with people they know and trust rather than switching opportunistically from one source of supply to another.

So, opportunistic behaviour is the exception rather than the rule, which creates a trading environment conducive to collaborative commerce. An example of collaborative commerce is seen where Big C which is a supermarket that is a French/Vietnamese joint venture, operating as a large-scale supermarket since 1998, currently with three outlets in HCMC have the foresight to discuss the nature and scope of the promotion with the suppliers before implementation, to avoid the empty shelves that so often result from compliance-based promotional activities in the developed markets of Western Europe and North America. From the above case of vegetable supply chains in HCMC it is evident that adoption of collaborative trading practices is not the exclusive domain of business school graduates or account managers in branded manufacturers and does not require the services of expensive consultants to implement. However, what it clearly needs is a strong collaborative culture and trading environment that are conducive to information sharing and supply chain coordination.

Barratt and Oliveira (2001) found that a major barrier to the development of CPFR (collaborative planning, forecasting and replenishment) initiatives was a lack of attention to developing front end agreements as to specifically what organizations were going to collaborate over. This poor understanding is further increased due to the association of collaboration with the hype surrounding e-business whereby technology has been promoted as the key to enabling wide-scale inter-organizational collaboration (Sabath & Fontanella, 2002).

Another major barrier would appear to be the context for collaboration, in terms of when to collaborate and with whom. Some of the confusion surrounding this issue would appear to come from a number of sources, including the implication that collaboration must be scaleable to a large number of customers and suppliers. CPFR remains the Holy Grail for many supermarkets and suppliers, struggling with inefficient practices with respect to promotional planning, demand management, production scheduling and inventory control.

In spite of the aforementioned barriers, this collaborative practice has shown to have great benefits such as between trading partners where it has been shown to lead to a better matching of supply and demand, the elimination of waste, a reduction in inventories and out-of-stocks, and an increase in on-shelf availability. These outcomes of the practice are likely to lead to better performance of the hotel.

Cooperative Behaviour

Trust is the willingness of a party to be vulnerable to the action of another party based on the expectation that the other will perform a particular action important to the trustor irrespective of the ability to monitor or control that other party (Mayer *et al.*, 1995). Trust can also be defined as the extent to which supply chain partners perceive each other as credible and benevolent (Doney & Cannon, 1997).Credibility reflects the extent to which a firm believes their relationship partner has the expertise to perform effectively while benevolence occurs when a firm believes their relationship partner has intentions and motives that will benefit the relationship (Ganesan, 1994). This is supported by Moorman (1993) who defines trust as a willingness to rely on an exchange partner in whom one has confidence.

Swan and Trawick (1987), operationalised trust in five aspects of; dependable or reliable, honest or candid, competent, partner orientation, and likeable/friendly while Sako (1992) operationalises it in three dimensions of; contractual trust, based on the belief that the other party will fulfill its promises and act as agreed; competence trust, based on the belief that the other party will be capable of doing what it has promised; and trust in goodwill, based on the shared belief of both parties that the other is deeply compromised to promoting a good development of the relationship and is willing to do more than could be expected according to the contractual terms without expecting anything in exchange. At the beginning of the new millennium, scholars continue to stress the importance of trust in developing and managing business dyads (McCole, 2002; Svensson, 2001). The importance of trust can be explained by the fact that it is seen as a phenomenon which contributes to the strength of inter-personal relationships, intra-organizational relationships and inter-organisational relationships in business dyads (e.g. Grönroos, 2000; Håkansson and Snehota, 1995; Morgan and Hunt, 1994).

Attitude towards Key Suppliers

The impact of management support is established in Drucker's framework of the theory of business (Drucker, 1969, 1994); support can be reflected in the attitude and behavior of organizational members. Siguaw *et al*. (1998) referred cooperative behaviour as cooperative norms, which is defined as the perception of the joint efforts of all parties to achieve mutual goals while refraining from opportunistic actions. When cooperation is the norm, a cooperative attitude is said to exist within the organization. Such a cooperative attitude helps to ensure that multiple components are focussed on the same, or very similar, process outcomes. Traits such as coordination, collaboration, commitment, communication, trust, flexibility, and dependence, are widely considered to be central to meaningful relationships. Performance is defined as the accomplishment of a given task measured against preset known standards of accuracy, completeness, cost, and speed. For the purpose of this research study, performance will be conceptualized along the dimensions of reduced ordering costs,

improved quality and reliability, increased profits, reduced customer complaints, flexibility and delivery as well as an improved organizational reputation. They coincide with the four distinct operational performance dimensions (De Toni & Tonchia, 2001).Performance indicators are a tool for organizational learning, communication, strategic change, and improvement, all in the context of existing management processes. Critical assessment of performance helps to maximize the return to all who invest in them

Methodology

A survey design was employed to determine the role of information sharing on hotel Performance. A sample group was selected from the special Gazette notices number 3976 of 13th June, 2003 and Gazette Notice Number. 5693 of 23rd July, 2004 on the classifications of hotels and restaurants. Sample size determination was through Yamane (1967), who provided a simplified formula to calculate sample sizes. This formula was used to calculate the sample size. The formula is shown below.

$$n = \frac{N}{1 + Ne^2}$$

Where n = sample size
N = size of population
e = error of five percentage points
When the formula is applied, the sample size is shown below.
$n = 57/ 1 + 57 (0.05)^2$
n = 49.89059

This formula resulted in a sample of 50 town hotels both globally and locally managed (or franchised). The respondents included largely procurement managers, deputy procurement managers, operations managers and storekeepers, of whom 22 were male and 11 female representing 67% and 33% respectively. The participants were highly educated with 90% having a university degree or having attained middle college education. Due to population heterogeneity, proportionate stratified sampling was later used to determine the number of sampling elements in each strata.

Research Methods

A questionnaire was designed to identify the extent to which information sharing impacted on hotel performance. The questionnaire was developed in several stages. Firstly, a questionnaire was drafted based on extensive literature review. The draft was then discussed with academic colleagues. Using their valuable input, changes to the structure and form of the questionnaire were implemented. This resulted in the development of a five point Likert scale continuum which itemized the domains of information sharing into a set of activities. Interviews were also conducted. Open-ended questions were developed to guide semi-structured interviews with the aid of unstructured questionnaires in the form of interview guides.

Measures

CPFR was operationalised as a practice addressing not only replenishment but also joint demand forecasting and promotions planning, focusing on promotions and special-line items. While the dependent variable hotel performance criteria was operationalised as the degree to which the chain members achieve better order fulfillment, improved quality, customer satisfaction, and responsiveness among others as a result of collaboration. They coincide with the four distinct operational performance dimensions (De Toni and Tonchia, 2001)

Data Collection

Data was collected from April 2014 to August 2014 over a four month period. The researcher also conducted a meticulous desk study of general information related to the sampled organizations after which the final version of the questionnaire, measuring all items on a five point scale, were then sent out to procurement/materials/supply chain/operations directors, managers in the selected hotels. The tourism sector of which the hospitality industry is part of is Kenya's second foreign exchange earner after tea and employs 3 million people, 500,000 directly and the rest being suppliers (Nabukewa & Mgidu, 2015). With this critical mass, the need to improve supplier buyer relations through improved information sharing cannot be over emphasized. The researcher assisted by research assistants also held interviews with the selected respondents. Prior to the interview dates, a copy of the interview schedule was sent to the interviewees. This was significant as it enabled them to have time to reflect on the issues at hand. This faciliated the collection of rich and in-depth data. The study terminology was also explained prior to each interview, and questions were rephrased as necessary. Interviews were conducted in either the business center of a respondent's hotel or in a restaurant in (or outside of) the hotel.

Open Data Kit Collect (ODK) which is a replacement for paper forms with support for geo-locations, images, audio clips, video clips and barcodes, as well as numerical and textual answers was used by the researchers to support data collection. It is designed to work out of touch with a cellular network / Wi-Fi during the data collection effort. An application in the form of the questionnaire was coded and was an optional mode of data collection for respondents who did not mind the mode. This was advantageous as it eliminated tedious and costly data entry. It also provided assurance that the research assistants actually visited each and every sampled hotel as uploads provided global positioning system (GPS) coordinates which provide the exact location of users, 24 hours a day, in all weather conditions and anywhere in the world with an accuracy of 10 to 100 meters.

Validity and Reliability

To ensure and increase stability of the measure, a pilot study was conducted on the research instrument. Validity and reliability (internal consistency), as measures of the representativeness and completeness of an instrument, are important if research is to be well inclusive. Also, Van-Teijlingen and Hundley (2001) note that pretesting is useful since it helps to establish whether the study techniques are effective and helps to uncover internal variabilities, hence making the instrument more objective. Before the onset of the study, the questionnaire and interview guides were pretested on

the respondents to ensure purification, and to ascertain their validity and reliability. These respondents bore the same characteristics as the study's sample however these respondents were not included in the final study. The reliability of the research instruments was analyzed using Cronbach's alpha (Cronbach, 1951). Cronbach's alpha is a popular reliability testing method. It indicates the extent to which questionnaire items can be treated as a single latent construct. Table 1 shows the reliability results.

Table 1. Reliability Analysis

Variable	No. of items (N)	Cronbach's Alpha
CPFR	5	.847
Hotel Performance	8	.902

A 0.7 reliability is considered adequate for a survey instrument (Bland and Altman, 1997), although some authors consider 0.6 and higher adequate (Field, 2000). In this study, questions that yielded a Cronbach alpha value of 0.7 and above were acceptable in line with Cronbach (1951). Having an alpha coefficient of 0.9 indicates that the gathered data has a relatively high internal consistency and could be generalized to reflect opinions of all the respondents in the target population.

Data Analysis

Logarithmic Transformations

Logarithmic transformations of variables in a regression model are mostly applied to handle situations in which non-linear relationship exists between the variables (dependent and independent variables). Logarithmic transformation ensures transformation of highly skewed or non-normal variables into a more approximately normal variable. The resulting distribution is referred to as log-normal distribution and is usually normally distributed. The logarithmic transformation model employed in this study is discussed below.

Linear-log model: $log\ Y_i = \alpha + \beta X_i + \varepsilon_i$

In this type of log-linear model, one-unit increase in the variable X leads to an expected increase in log Y of $\hat{\beta}$ units. To obtain the expected value of Y, we multiplied $e^{\hat{\beta}}$. For instance, for every unit increase in the independent variable X multiplies the expected value Y by $e^{\hat{\beta}}$.

The transformed regression model that guided analysis for this thesis is presented underneath.

$Log(Y) = B_0 + B_1X_I+B_2X_2+ B_3X_3+ B_4X_4 + B_5X_5 +\mathcal{E}$

Where: Y = Hotel Performance
Log is the natural logarithm in
$B_{0:}$ Constant
X_1: Incentive alignment
X_2: Information Sharing
X_3: Joint Improvement
X_4: CPFR
X_5: Decision Synchronization
$\mathcal{E}$: error / "noise" term reflecting other factors that influence performance

$B_1 \ldots B_5$ are regression coefficients

The statistical model used for analysis of the effect of the moderator is provided below as follows.

$Log\ (Y) = B_0 + B_1X_I+B_2X_2+ B_3X_3+ B_4X_4 + B_5X_5 +B_ZZ + B_{1Z}X_1Z+ B_{2Z}X_2Z+B_{3Z}X_3Z+ B_{4Z}X_4Z+ B_{5Z}X_5Z+ \mathcal{E}$

Since hotel performance is unlikely to be predicted solely by the collaborative practice of CPFR and mediation by cooperative behavior, other predictor variables were added on to the model to make it more realistic and wholesome.

Quadrant analysis which is one way of simultaneously analyzing what attributes are important to consumers and how consumers rate particular brands, processes according to those attributes was employed. Based on the BCG matrix, Priorities Factors for Improvement (PFI) are obtained. FPI were obtained by drawing a scatter plot of satisfaction index versus the relative importance of factors as determined by correlation coefficient. This method further outlined which processes are most important yet lacking in the present collaborative relationships

RESULTS

From the result in Table 2, the predictor variable CPFR has a $p<0.05$, at $p = 0.000$ implying that it is statistically significant in predicting the hotel performance at 5% significance level. Further, $p<0.005$ indicates that we should reject the null hypothesis and conclude that there is linear relationship between collaborative planning, forecasting & replenishment and hotel performance. That is $\rho \neq 0$.

To transform back our model to the form $\mathbf{Y = B_0 + B_1X_I+B_2X_2+ B_3X_3+ B_4X_4 + B_5X_5 +\mathcal{E}}$, Y was unlogged by obtaining $e^{\beta i}$, where i = 0, 1, 2, 3, 4, 5 this gives the terms of effects of changes in X on Y. The unlogged coefficients are illustrated in Table 4.10.

From the Table 3, it can be seen that if all other independent variables other than Collaborative planning, forecasting and replenishment are set to zero, a unit increase in Collaborative planning, forecasting and replenishment will lead to an increase in hotel performance by 0.054768 (5.5%) . Hill (1999) observes that as a result of CPFR, Warner-Lambert's (Pfizer) service levels increased from 87% to 98%, while the lead times to deliver the product decreased from 21 to 11 days. The partnership also increased Listerene sales by $8.5 million over the test period. A myriad of other studies indicate that CPFR has a substantial impact on service levels and costs (Hill, 1999; Williams, 1999; Butler, 1999; Parks, 2000; Abend, 2000)

The moderating role of co-operative behaviour was added into the relationship to check if it would alter the linear relationship between CPFR and hotel performance. The analysis is presented in Table 4.

Table 2. Multiple Regression Analysis

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	p-value	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	.242	.011		21.787	.000	.219	.265
	Incentive alignment	.055	.002	.252	27.888	.000	.051	.059
	Information sharing	.062	.002	.297	30.231	.000	.057	.066
	Joint Improvement	.057	.002	.285	31.065	.004	.053	.060
	Collaborative planning, forecasting and replenishment	.053	.002	.280	26.883	.000	.049	.057
	Decision Synchronization	.061	.001	.515	52.858	.003	.059	.063
a. Dependent Variable: Log_Trans_Average_Hotel_Performance_Score								

Table 3. Unlogged Coefficients

Variable	Untransformed B_i	$e^{\beta i}$	$B_i (e^{\beta} - 1)$	Std. Error	p-value
(Constant)	.242	1.273895	.273895	.011	.000
Incentive alignment	.055	1.056906	.056906	.002	.000
Information sharing	.062	1.063499	.063499	.002	.000
Joint Improvement	.057	1.058252	.058252	.002	.004
Collaborative planning, forecasting and replenishment	.053	1.054768	.054768	.002	.000
Decision Synchronization	.061	1.062848	.062848	.001	.003

Table 4. Moderating Effect Analysis

Coefficients[a]				
Model	B	Std. Error	t	p-value
Constant	0.30363	0.066023	4.599	0.0001
Incentive alignment	0.035486	0.019485	1.821	0.0805
Information sharing	0.095398	0.015448	6.175	0.0000
Joint Improvement	0.012689	0.025289	0.502	0.6202
Collaborative planning, forecasting and replenishment	0.070999	0.013453	5.278	0.0000
Decision Synchronization	0.078933	0.008083	9.765	0.0000
Interactions				
Decision Synchronization & Trust and attitude	-0.01766	0.007588	-2.327	0.0283
Information sharing & Trust and attitude	-0.03244	0.014758	-2.198	0.0374
Joint Improvement & Trust and attitude	0.043468	0.024376	-2.083	0.0467
Collaborative planning, forecasting and replenishment & Trust and attitude	-0.01444	0.012001	-1.203	0.2400
Incentive alignment & Trust and attitude	0.017889	0.018187	0.984	0.3347

From the results, it is established that adding cooperative behavioural factors (trust and attitude) to the model changes the relationship between independent and dependent variables. In respect to CPFR with interactions of Trust and Attitude no linear relationship was found with a p=0.2400. This means that at 0.05 level of significance, Collaborative planning, forecasting and replenishment & Trust and attitude may not predict hotel performance. This therefore means that cooperative behaviour is not totally essential to bring about hotel performance should the collaborative supply chain practice of CPFR be implemented.

Quadrant Analysis for Collaborative Planning, forecasting and Replenishment Indicators

Quadrant analysis was then used to measure the level of satisfaction versus level of importance as measured by the correlation coefficient for each of the statements under this variable. The quadrant plot grouped decision factors into four quadrants based on the Boston Consulting Group (BCG) Matrix for decision making. With regards to CPFR, the hotels and their suppliers seem to be getting the practice right as most of the variable indicators were in the maintenance quadrant of the quadrant analysis. An analysis of CPFR indicators showed that collaborative planning with key suppliers to better match supply and demand, involving suppliers prior to promotions to ensure constant supply during peak demand, planning of promotions as well as fixing promotional prices with key suppliers are maintenance factors and offer highest satisfaction and are important indices.

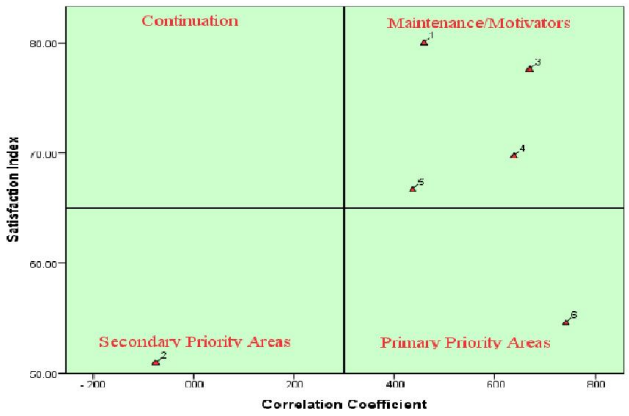


Figure 4.9. Quadrant analysis for collaborative planning, forecasting and replenishment indicators

Where:

No.	Statements
1	Collaborative Planning with our key suppliers is always done to better match supply and demand
2	Planning on promotional prices is rarely done with our key suppliers
3	Prior to a promotion, my organization involves the supplier to ensure constant supply during the increased demand periods
4	Planning of promotional activities (price mark downs) always involves our key suppliers but we do not make the supplier foot the bill
5	Planning on promotional prices is often done with our key suppliers
6	Sales forecasting is mostly done with our key suppliers

These services are prevailing motivators of hotel performance. However, a primary priority area is that the hotels and their key suppliers are not forecasting sales in collaboration. This is an indicator that is most important but scored less and is a primary priority to improve satisfaction.

Conclusion

With respect to CPFR, the study unsurprisingly concludes that this collaborative practice is statistically significant in predicting hotel performance. Hotels in the industry should implement this practice to better performance. Cooperative behaviour (trust and attitude) was found not to have a significant influence on hotel performance when it mediated the relationship. Therefore it can be deduced that CPFR on its own significantly improves operational performance. This performance is in most cases through the leveraging of information technologies such as internet based CPFR solutions, tracking and reporting of performance against indicators as well as liaison devices activated to align different supply network activities. Liaison devices include meetings as well as cross company teams to ensure collaboration. It was the fifth most important collaborative practice when ranked against the other practices in the study. CPFR has a role in hotel performance where it was found that it facilitates planning of supplies and is prevalent in joint promotions and planning in order to better sales. CPFR from the findings ensures a win-win relationship when it came to the collaborative hosting of tourists, where a hotel books in more clients over and above the available bed occupancy and hosts the remaining clients in nearby hotels. In hotel circles this practice is referred to as "out booking".

Collaborating planning of staff is also a common practice where staff may be shifted from one hotel to offer services at a collaborating hotel in times of peak demands. Wage payments for the staff are in most cases not an inhibiting factor as the spirit of cooperation has each party working together to ensure everyone wins. What was not entirely clear was how this was effected whether through gentleman agreements or through structured contracts. Through quadrant analysis that is based on the BCG matrix, the study recommends that sales forecasting should be jointly done with key suppliers. This is a primary priority area that is most important but has scored low in terms of satisfaction. The hotels should invest in this as a priority in order to improve satisfaction with a higher level.

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