Original Article

Factors Affecting the Supplier's Quality of the Perishables Supply Chain; Special Reference to the Hotel Industry in Sri Lanka

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ABSTRACT

Food is the main factor that anyone who measures the quality on a hotel or a restaurant. If there is good quality food, consumer will never forget to revisit that restaurant. If they are unable to maintain the food quality of perishables there can be many issues for hoteliers that directly affect the business. In this context, suppliers' quality, of the perishables supply chain plays vital role in the hospitality industry as it engages with many aspects, procurement, packing, transportation. storage, temperature, and maintenance. However, these challenges affect the final quality of perishable food items therefore, identifying these factors is crucial for hoteliers to develop strategies to mitigate them. Therefore, the current study investigates the most critical factors that affect the supplier quality of the perishables supply chain and finds the impact of variables on the quality of the perishable supply chain in the hospitality industry, in Sri Lanka. In this study, an online questionnaire was distributed among the people who work in the procurement section and the hotel chefs in the 3-star to 5-star hotels, in Negombo and Colombo. The convenience sampling method was used with 384 respondents, but the survey was concluded with 200 responses because of these data collected from managerial and executive level employees from selected areas in Gampaha district. The reports of the statistical outputs of the SPSS analysis, including reliability analysis, demographic factor analysis, cross-tabulation analysis, descriptive analysis, correlation analysis, and regression analysis, are included in the study. However, the outcome shows high internal consistency in the reliability test, positive ratings for temperature, storage method, packaging method, lead time, and transport method and there was a significant positive correlation between these variables and the quality of the perishable supply chain showing the positive impact. Further research suggests examining the impact of each perishable factor in depth by exploring the relationship between quality and food wastage.

Index Terms- Perishable Supply Chain, Food Quality, Supplier's Quality

INTRODUCTION

The Sri Lankan hotel industry is a developing industry with remarkable natural tourism resources, modern trends, and an authentic food culture. It is a well-known holiday destination, growing in the world with many hotel chains growing across the island. As per the Sri Lanka Tourism Board statistics, tourism makes a significant contribution to the country's GDP. Even after the Easter Sunday attack, the tourism sector's foreign exchange earnings are still contributing to the economy. In this nature, drawing attention to the hotel industry is vital for every hotel owner because the basic measurement that any guest uses to measure the standard of the hotel is the food that they are served. (Saurav Negi, 2016) Therefore, effective supply chain management for perishable food such as meat, eggs, fish, dairy products, vegetables, and fruits is crucial for them, as it networks the company and suppliers to produce and distribute a specific product to the final buyer. Therefore, the challenges may lead to spoilage, safety risks, and quality deterioration (Anon., 2021), which creates serious circumstances not only for hoteliers but also for suppliers and consumers. (Anna Brzozowska, 2016). Global perishable food waste is high during the upper stream of the supply chain process. So, the hotels always try to reduce their waste and save the cost they spend on perishables in their operations. In this way, the quality of perishable foods depends on the type of supplier selected by the

company, and food waste is significant in the supplier's process. However, this paper focuses on finding out the most influencing suppliers' quality factors of the perishable supply chain in the hotel industry and its impact on suppliers' quality and the perishable supply chain in the hotel industry in Sri Lanka, same searching for suggestions to improve suppliers' quality in the perishable supply chain in the hotel industry in Sri Lanka. Therefore, the study intends to fill the knowledge gap while also filling the context gap, in Sri Lanka, which provides insights for improving the quality of perishables in the field of practitioners, hotels, and supply chains.

RESEARCH METHODOLOGY

This section discusses a deeper into the conceptual framework, the hypotheses under evaluation, the methodology used, the research design, research philosophies, as well as data sampling and collecting techniques, culminating in the subsequent analysis.

Research Design

A research design is the setup of parameters for data collection and analysis to integrate relevance to meet the research objectives of the study. In current research there are three research objectives and based on that the conceptual framework and hypotheses have been aligned concerning past literature. The onion model helps the researcher to grasp the research design properly.

Research Philosophy

The researcher followed a positivist philosophy, applying quantitative methods, and statistical analyses to address the identified research objectives about supplier quality within the perishables supply chain of the hotel industry in Sri Lanka. Obtaining, real-world results helps practitioners in hospitality supply chain management to improve strategies for upgrading the quality of perishable food items within Sri Lankan hotels. Furthermore, the positivist approach makes the researcher comfortable by testing and presenting statistical results through the formulation of hypotheses.

Research Approach

The deductive research method has been used in this study, as the emphasis is placed on reviewing and studying existing hypotheses related to the investigated research title, which builds upon the work of others. The researcher then tests assumptions using a pre-established theoretical framework. The process involves identifying relevant theories, creating a conceptual framework, formulating hypotheses, and conducting analysis based on the collected data.

Research Strategies

A research strategy is a plan for achieving research objectives. Therefore, the researcher used a self-administered questionnaire to collect data, followed by a quantitative technique. Experimental strategy is the most practical way to use research strategy so that the main objectives are met, and hypotheses are proved, rejected, or verified.

Conceptual Framework

Figure 1 illustrates the theoretical structure and the relationship between the independent variables and the dependent variable.

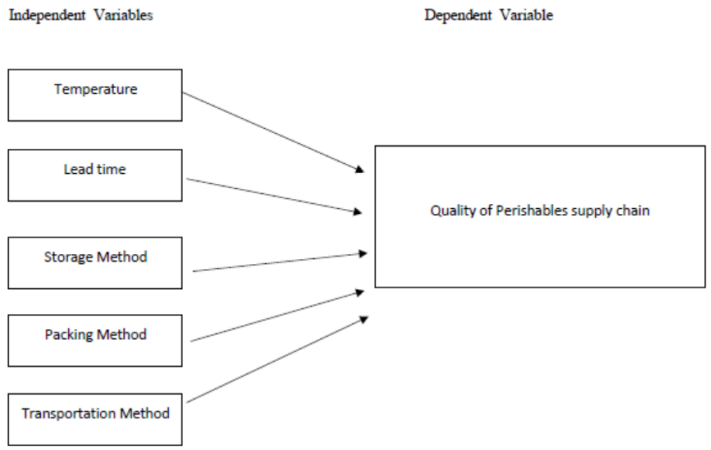

Figure 1 Conceptual Framework

Operationalization of Variables

It refers to the process of identifying and transforming the variables into measurable indicators. In this study, all five independent variables and dependent variables have been defined using 5-Likert scale measurements.

Research Hypothesis

Temperature

H0 – There's no relationship between the temperature of the perishables and the quality perishable supply chain.
H1 – There's a relationship between temperature of the perishables and the quality perishable supply chain.

Lead Time

H0 – There's no relationship between the lead time of the perishables and the quality perishable supply chain.
H2– There's a relationship between the lead time of the perishables and the quality perishable supply chain.

Transportation Method

H0 - There's no relationship between the transportation method of the perishables and the quality perishable supply chain.
H3- There's a relationship between the transportation method of the perishables and the quality perishable supply chain.

Storage Method

H0- There's no relationship between the Storage method of the perishables and the quality perishable supply chain.
H4 - There's a relationship between the Storage method of the perishables and the quality perishable supply chain.

Packaging Method

H0 - There's no relationship between the lead packaging method of the perishables and the quality perishable supply chain.
H5- There's a relationship between the lead packaging method of the perishables and the quality perishable supply chain.

Population

The population in this study is the upstream supply chain of hotels and restaurants in the Negombo and Colombo areas in Sri Lanka, specifically focusing on the procurement section employees and chefs who directly work with perishable foods.

Sample Justification and Technique

The sample size of the study is 384 respondents which includes executive-level and managerial-level procurement sector employees and chefs from 3-star to 5-star hotels in the target sample. Out of 385, only 200 responded hence the study limited the selected sample size.

Data Collection Methods

The primary data collection is done through the distribution of a structured questionnaire among 385 people, and responses are to be collected through Google Forms. The questionnaire is divided into 3 parts. Part A focuses on the demographic background of the employees. Part B is designed based on independent and dependent variables, which are ranked using the Likert scale method. Part B question related to suggestions and recommendations to improve the perishable supply chain in the hotel industry in Sri Lanka.

Moreover, the researcher has referred to around 40 articles which means the secondary data are readily available from different online sources: scholarly articles, websites, research articles, etc.

RESULTS AND DISCUSSION

Validity and Reliability

Table 1 Reliability of factors

Variable Name	Cronbach's alpha value	No of items
Temperature	0.704	3
Lead time	0.707	3
Transport method	0.710	3
Storage method	0.702	3
Packaging method	0.718	3
Quality of perishable supply chain	0.710	3

The study utilized Cronbach's alpha to assess data reliability, focusing on multiple Likert questions in a questionnaire with a quantitative approach to identify relationships between independent and dependent variables. Table 1 shows that the results of

Cronbach's alpha value are more than 0.7 at the accepted level for 18 variables, which confirms the internal consistency of the question and the reliability of the data set. Also, the model is suitable as the residuals show no significant autocorrelation, as indicated by the value of 2.024.
Descriptive Statistics of Variables

Table 2 shows that all independent components have a mean value of 4.3783, 4.1900, 4.1350, 4.1850, 4.1467, and 4.1833, with the packaging method having the highest deviation (0.61766). The quality of the perishable supply chain has a minimum deviation (0.53961), indicating less deviation. Skewness should be between +1 and -1, and results are considered normal if they are less than three times the standard error.

Table 2 – Descriptive Statistics

		Temperature	Lead time	Transportation method	Storage method	Packaging method	Quality of perishable supply chain
N	Valid	200	200	200	200	200	200
	Missing	0	0	0	0	0	0
Mean		4.3783	4.1900	4.1350	4.1850	4.1467	4.1833
Std. Deviation		.56481	.55467	.60714	.54265	.61766	.53961
Skewness		-2.674	-1.066	-1.378	-1.105	-.917	-1.254
Std. Error of Skewness		.172	.172	.172	.172	.172	.172
Kurtosis		12.372	4.597	4.609	5.086	2.536	5.390
Std. Error of Kurtosis		.342	.342	.342	.342	.342	.342

Correlation Analysis

Table 3 – Correlation Analysis

Correlations		
		QPS
Packaging Method	Pearson Correlation	.556**
	Sig. (2-tailed)	0.000
	N	340
Storage Method	Pearson Correlation	.545**
	Sig. (2-tailed)	0.000
	N	200
Lead time	Pearson Correlation	.506**
	Sig. (2-tailed)	0.000
	N	200
Temperature	Pearson Correlation	.462**
	Sig. (2-tailed)	0.000
	N	200
Transport Method	Pearson Correlation	.449**
	Sig. (2-tailed)	0.000
	N	200

Pearson Correlation analysis is used to identify the association between the dependent variable (perishable supply chain) and the identified five independent variables. Table 3 results show that there is a positive linear relationship between each factor and the quality of the perishable supply chain. The packaging method has the strongest positive impact followed by the storage method, lead time, temperature, and transport method, values provided 0.556, 0.545, 0.506, 0.462, and 0.449 respectively. The values are all significant at the 0.01 level (2-tailed), meaning a low probability of their occurrence by chance. Overall, these correlation coefficients offer significant insights into the variables that impact the quality of the perishable supply chain in the Sri Lankan hotel industry. By carefully controlling these variables, hotels can improve their overall customer experience.

Regression Analysis

Table 4 – Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.556[a]	.309	.305	.44982	
2	.620[b]	.384	.378	.42567	
3	.647[c]	.419	.410	.41442	2.024

a. Predictors: (Constant), PM
b. Predictors: (Constant), PM, STM
c. Predictors: (Constant), PM, STM, T
d. Dependent Variable: QPS

Regression analysis is used to explain the relationship between a dependent variable and one or more independent variables. Table 4 provides information about the goodness of fit of the model. The values 0.309, 0.384, and 0.419 for R Square indicate that the independent variables explain 30.9%, 38.4%, and 41.9% of the variance in the dependent variable, which is the quality of the perishable supply chain, respectively. Further, the model effectively explains perishable supply chain quality variation based on independent variables, with the Durbin-Watson statistic indicating autocorrelation in residuals.

Analysis of Variance

ANOVA is used to identify significant differences between the means of three or more independent groups. Table 5 displays F-test statistics for the regression model, indicating high significance with a probability of P = 0.000, less than 0.001. Also, it shows highly significant F-values (P = 0.000) for each

regression model, indicating that independent variables jointly influence the quality of the perishable supply chain.

Table 5 – ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	17.881	1	17.881	88.370	.000[b]
	Residual	40.064	198	.202		
	Total	57.944	199			
2	Regression	22.249	2	11.125	61.395	.000[c]
	Residual	35.695	197	.181		
	Total	57.944	199			
3	Regression	24.282	3	8.094	47.128	.000[d]
	Residual	33.662	196	.172		
	Total	57.944	199			

Determination of Coefficient

The "Determination of Coefficients" table provides detailed regression model coefficients and collinearity statistics, including unstandardized coefficients (B)**, representing the estimated change in the dependent variable.

Table 6 – Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	2.171	.216		10.031	.000		
	PM	.485	.052	.556	9.401	.000	1.000	1.000
2	(Constant)	1.475	.249		5.925	.000		
	PM	.315	.060	.361	5.265	.000	.666	1.503
	STM	.335	.068	.337	4.910	.000	.666	1.503
3	(Constant)	1.041	.273		3.806	.000		
	PM	.278	.059	.319	4.699	.000	.644	1.553
	STM	.261	.070	.262	3.734	.000	.602	1.661
	T	.205	.060	.215	3.441	.001	.762	1.312

The unstandardized coefficient for the constant in Model 1 is 2.171, indicating the expected value of the dependent variable when all independent variables are zero. The study uses t-values to test the significance of coefficients, with larger absolute t-values indicating more significant coefficients. in Model 1, the t-value for the coefficient of the Packaging Method (PM) is 9.401, indicating its high significance. The significance levels (p-values) are associated with each coefficient, with low p-values indicating significant differences from zero. For instance, all the coefficients in the three models have very low p-values (e.g., .000 or .001), indicating high significance. Collinearity statistics (Tolerance and VIF) assess multicollinearity among independent variables. Values close to 1 and VIF around 1 indicate no multicollinearity concerns in regression models.

Regression Model

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4$$

QPS = 0.278(PM) + 0.261(SM) + 0.205(T)

The quality of the perishable supply chain is estimated using a linear combination of independent variables, with coefficients (0.278, 0.261, and 0.205) representing their weights. This equation predicts perishable supply based on packing method (X1), storage method (X2), and temperature values (X3).

Table 6 explains the Variance Inflation Factor (VIF) and Tolerance which are used to assess multicollinearity. VIF measures the variance of an estimated regression coefficient, while Tolerance measures the proportion of variance in an independent variable not explained by other variables. The Multicollinearity Table shows that all VIF values are less than 10, indicating no multicollinearity concerns.

Table 7 – Multicollinearity

	Collinearity Statistics	
	Tolerance	VIF
Packing method	.644	1.553
Storage method	.602	1.661
Temperature	.762	1.312

Hypothesis Testing

Table 8 – Hypothesis Testing

Independent Variables	Pearson Correlation Coefficient	P Value	
Temperature	0.75	0.000	Significant
Lead Time	-0.60	0.000	Significant
Transport Method	0.85	0.000	Significant
Storage Method	-0.55	0.000	Significant
Packaging Method	0.70	0.000	Significant

The null hypothesis for each independent factor is rejected due to the repeatedly low p-values (all presented as 0.000), which reflect statistical significance at a chosen significance level and confirm a significant relationship with the quality of the perishable supply chain.

CONCLUSION

The study aimed to identify the most influential factor, assess the impact of suppliers' quality on the perishable supply chain, and suggest ways to improve suppliers' quality in the Sri Lankan hotel industry. Based on the findings, it was concluded that temperature is the most influential factor, and the packaging method and storage method have a significant impact on the quality of the perishable supply chain. It was also found that the transportation method has an insignificant impact on the quality of the perishable supply chain, while the lead time has an insignificant impact on the quality of the perishable supply chain. Therefore, based on the research findings and discussions presented in the study, the research objectives were justified. Further, the study recommends enhancing the quality of the perishable supply chain in Sri Lanka's hotel industry by sourcing directly from suppliers, implementing supplier rules, using technology, maintaining experienced staff, establishing government relationships, adopting suitable packaging methods, streamlining logistics, investing in high-quality packaging, and prioritizing food safety.

Future Research

In the future, researchers are required to investigate the relationship between perishable foods and food waste in hotel settings, as well as provide a deeper comprehension of the factors influencing perishable food quality and their specific consequences.

STUDY LIMITATION

The study on perishable items in Sri Lankan hotels has limitations, including a limited scope, data collection from executive and managerial staff, a sample size of 200 respondents, and a questionnaire designed to assume respondents' knowledge of perishable foods, which could limit the applicability of the findings to individuals with varying expertise levels.

DECLARATIONS

I hereby declare that appropriate acknowledgment of the secondary data has also been completed. I further declare that all the data included in this study was previously not submitted for any degree program before this submission.

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