

Examining the Use of Management Control Systems in Managing Perishable Goods: Evidence from Supermarkets in Colombo Area

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Abstract: Managing perishable goods is a challenging job due to their short lifetime, the possible spoilage of the products with their nature, and the retail demand uncertainty. Majority of perishable goods get spillage due to lack of use of Management Control Systems. This study aims to examine the impact of managing perishable goods in supermarket performances. The research draws on Simons' (1995) Levers of Controls framework. The study is mainly based on diagnostic control systems and interactive control systems only. The quality of perishable goods assortment is becoming a core reason for many customers to deviate from one supermarket to another competitor. The MCS seems to have a critical impact on supermarkets when controlling perishable goods. A regression analysis was made on the data gathered through supermarkets based in the Western province by using a structured questionnaire, and the results revealed that perishable goods comprise a significant positive influence towards supermarket performance. As predicted, interactive control systems have a positively moderate impression on perishable goods in the direction of the supermarket performance. However, contrary to our expectation, diagnostics control systems also have a positive impact on managing perishable goods towards the supermarket performance.

Keywords: Management Control Systems, Perishable goods, Supermarket performance

Background

The concept of supermarket is one of the blooming industries in Sri Lanka economy. The concept of supermarkets was delivered to Sri Lanka during early 1980's. Progressively they have captured a large quantity of consumers all over the Island and have established themselves as very dynamic and lucrative business within the country. Most of the supermarkets are owned by well-known leading corporations and companies throughout the country.

Supermarkets in urban areas have a higher demand as there are less number of flea markets for customers to buy fresh, quality perishable goods. Therefore, every supermarket needs a better Management Control Systems (MCS) to keep the richness of goods. MCS run a major role in controlling perishable goods. MCS is a measurement used to measure how well the functions of a business and performance help meeting the objectives and goals. MCS are the formal and informal structures that compare goals and strategy of a business adverse the actual outcomes (Chenhall, 2003). Both financial and non-financial measures are used in MCS (Chenhall, 2003). It is not incommensurate only consider the management control in supermarket. It should consider the chain of perishable goods from beginning to end of farmer to customer.

Nowadays, supermarkets are committed to provide better perishable goods for customers due to heavy competition in the

market, nowadays in Sri Lanka there are many number of emerging supermarkets. Therefore, it is their mandatory duty to provide better food to achieve the competitive advantage. For that there should be an efficient and effective management control system. The chain of supplying perishable goods plays a major role in influencing the efficient management control system. It is crucial for the management to identify and understand the supply chain between the farmer and the supermarket. They must be considering the quality and the freshness of goods that are brought in to the supermarket premises. After the goods are brought in the perishable foods must be taken care of, necessary food must be stored in cold environment. The quality and safety of food being produced in a high consideration conditions are to a substantial degree influenced by the measure of the air coming into contact with the perishable goods.

In the present in Sri Lanka, supermarkets are emerging at a fast rate. In the early stages of supermarkets, they were only concentrated in locations in and around Colombo city, but nowadays leading supermarkets have established their outlets all over the country. The global marketplace for perishable goods as refrigerated products and prepared meals is becoming because of the dynamic lifestyles and in general diminishing duties. Due to their common fragility and restricted period of time, dealing with those goods is far more advanced and incorporates considerably higher dangers contrasted with durable items (Thron et al., 2007). Perishable goods are not safe every time that have acceptable level of risks including freshness, taste, status of quality (Siddh et al., 2015). If organizations do not properly manage perishable goods, it will have an impact on sustainability. United Nations sustainable development goals

also concern about preserving food (2007). UN evidence shows that majority of the people do not have enough food to eat and it has become very important in developing countries. One of the major reasons to arise this matter is the weakness of managing supply chain in food items. The purpose of this study is to examine how organization use MCS in managing perishable goods. The study draws on Simons's Levers of Controls (LOC) framework to examine how MCS are used to manage perishable goods. LOC consist of four controls, namely, belief system, boundary systems, diagnostic control systems and interactive control systems. Out of these four levers, this study refers diagnostic and interactive control systems.

Problem Statement

Majority of perishable goods get spillage due to lack of use of MCS. Specially, when transporting perishable goods to the supermarkets from villages, the quality and freshness are not in standard. But the cost of perishable goods has shown a serious increase across the world and perishable food supply chain quality is increasing rapidly but it is not still good in standard (Siddh et al., 2015). Supply chain integration has turned into a major approach for ensuring the reliable sourcing of fresh vegetables to urban supermarkets (Ruben et al., 2007). Wang Li- Juan (2012) recognized standard of distributing perishable goods in temperature controlled supply chains, namely, cold chains. Supermarkets should aware all activities in supply chain. By following the TQM supermarket can use the MCS in efficient and effective manner. In current scenario a large number of perishable goods are wasted due to lack of use of MCS. This is a common practice that most supermarkets have been experienced due to lack of understanding of their MCS.

Research Question

01. What extent MCS are used to manage perishable goods in supermarkets?
02. How perishable goods effect to the supermarkets' performance?

Objectives

01. Examine the effect of perishable goods towards the supermarket performance.
02. Identify the effect of MCS when managing perishable goods.

Literature Review

Management Control Systems (MCS), as depicted in the English writing, obtain and utilize data keeping in mind the end goal to help the coordination of arranging and hierarchical control choices, with the objective of enhancing the aggregate choices inside the association (Horngren, Foster and Datar, 2000). MCS consider that the controls are portrayed by the utilization in business administration, covering execution estimation and reward frameworks by accomplishing foreordained levels (Otley, 1999). Simons (1995) characterizes the MCS as means for effective usage of the methodology. MCS contain formal and casual instruments and procedures utilized by associations to measure, monitor and manage with their execution to actualize techniques and accomplish their objectives (Horngren, Foster and Datar, 2000). More specifically, MCS play a significant role in (i) catching superior approaches and resources by generating new information, (ii) making dynamic competences, (iii) communicating internally in a more precise and vital way, and (iv) developing new products and services in a very systematic and strategic way. (Simons 1990, 1995, 2000; Chenhall 2003; Henri 2006; Grafton et al. 2010).

The purpose of this research is to examine how perishable goods are managed in supermarkets. Some authors have

indicated to the different sorts of utilization of formal MCS (Simons, 1990, 1991, 1995a) or the different roles of MCS (Chapman, 1997, 1998) as clarifications for these clearly conflicting investigations. This research examines the use of MCS by using levers of controls (Simons, 1995) in perishable goods with evidence from Supermarkets. In current time, the problem arises from the lack of freshness, quality of perishable goods.

There are four types of MCS that together work as levers of control (LOC): beliefs systems, boundary systems, diagnostic control systems and interactive control systems, which ought to be balanced so as to implement strategy effectively (Simons, 1994, 1995, 2000). These frameworks enable management to screen circumstances of improper goal setting and incompetence to achieve goals due to unexpected changes (Simons, 2000)

Below figure 1 shows the mechanism of the input, process and output functions and it is how engage with the management of an organization.

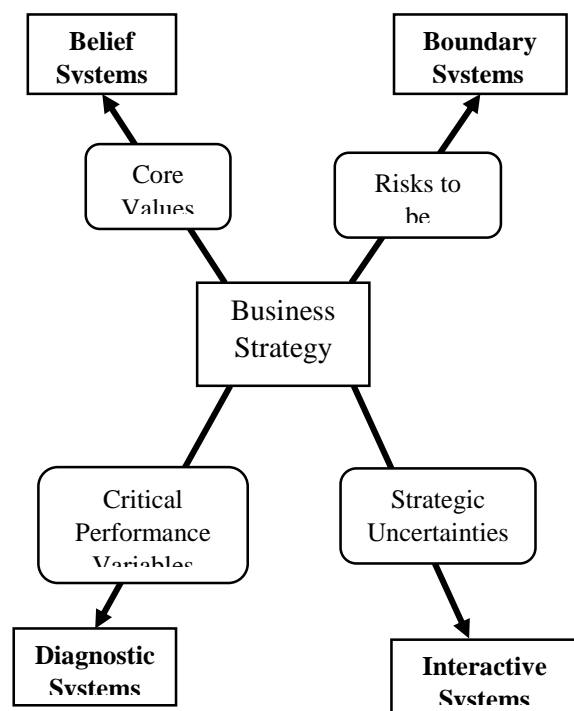


Figure 1. Controlling business strategy: Framework analysis (Simons, 1995)
Source: Levers of Control

A. Use of MCS in Managing Perishable Goods in Supermarkets

Management Control Systems are used in every aspect of supermarkets; it is very important to manage a good Management Control System in the supermarket. While MCS can be used in various activities such as input, process and output controls. This study focuses on how MCS can be used in managing perishable goods in supermarkets

B. Theoretical Development

The present study looks to construct upon foregoing literature reviews focused on Simons levers of control framework (1990, 1991, 1995a, 2000). It focuses on the tensions between the organizational need for innovation and the organizational need for the achievement of pre-established objectives, and it points out the important tensions among mechanisms of formal MCS that need to be managed in order to successfully deal with these organizational needs. Depending on their design allocated, Simons classifies formal MCS in two categories: beliefs systems, boundary systems are feedback and measurement systems.

Furthermore, Simons clarifies the relevance of the style of use of control systems, recognizing two styles of use of feedback and measurement control systems: diagnostic control systems and interactive control systems. In particular, interactive control systems are measurement systems that are used to focus attention on the regularly changing information that top-level managers consider to be of strategic importance. In difference to diagnostic controls, what symbolizes interactive controls is senior manager's strong level of contribution. Top managers pay every day and regular attention to interactive control systems, and get personally involved in them. (Bisbe and Otley, 2004).

1) Interactive Control System

This formal system used by top managers to regularly and personally involve themselves in the decision activities of subordinates (Simons 1994). Interactive control systems are more likely to implement and encourage forward-looking creative ideas and strategic initiatives, and keep interactive relationships among employees (Simons 1995; Widener 2007).

When considered this concept to perishable goods the sale of perishable goods is vastly increasing while having considerable importance for supermarkets worldwide (Thorn, 2007), due to that managing them in good manner is highly important. Further to the above discussion regarding interactive control systems (ICS), it supports to reduce the gap between managers and employees. It could also consider similar as decentralization. Decentralization is the process by which the activities of an organization, particularly those regarding planning and decision making are distributed or delegated away from a central authoritative location either group. Tee (2007, p.1355) described that decentralization must be favored because it brings top management close to new technologies, the customer and the market. Usually MCS is doing a major role in quality, freshness, taste and fragrant in perishable goods which could affect the organization performance.

2) Diagnostic Control Systems

This formal feedback system used to monitor organizational outcomes and correct deviations from preset standards of performance. Organizations also use diagnostic control systems to monitor employees to deliver tasks in line with organizational objectives by constraining their behavior (Simons 2000; Henri 2006; Widener 2007; Mundy 2010). In doing so, diagnostic control systems compare

organizational outcomes with preset standards. Therefore, diagnostic use of controls is recognized as a negative force that imposes constraints and emphasizes compliance with orders (Henri 2006).

The diagnostic control system is the formal system of organizational information that monitors results and corrects deviations from expected performance standards (Chenhall, 2007).

Levers of controls (Simons,1995) can summarize by using the what, why, how, when and who of the four basic levers managers use to control the formation and implementation of business strategy. Within measurement based control systems, a further distinction can be made according to the attention patterns of senior managers and the effects of these attention patterns on the formation and implementation of strategy.

C. Difference between Diagnostic and Interactive Management Control Systems

Diagnostic and Interactive control frameworks are the parts of the systems that offer help in the execution of methodologies or in adjusting to concentrated conditions (Simons, 1995). The Diagnostic control framework tries to guarantee that choices line up with the objectives of the association (Simons, 1995). Oftentimes, when creators refer to MCS, they ordinarily just refer to the diagnostic data framework. The diagnostic control framework is the formal arrangement of hierarchical data that screens results and rectifies deviations from expected execution guidelines (Chenhall, 2007). Simons (1995) fortifies the significance of the interactive framework, which bypasses these issues and means to give answers to administration components that were not considered in the already created vital arranging process. Therefore, the

interactive control concerns the framework that includes administrators in the choices of subordinates; this present framework's focal point of consideration is on the parts of control that don't routinely show up in data frameworks (Abernethy and Brownell, 1999). The diagnostic framework includes two unique snapshots of control: (a) ex-ante, when goals and objectives are defined and at some point are approved for the short, medium, or long term; within the strategic planning, balanced scorecard, capital budget, and budget and rolling forecast; we can get a common view of the organization, common vocabulary, and focus on the critical success factors; and (b) the second very important moment concerns the monitoring process when the organization follows up on goals, results, reviews key measures, and enables discussion on variations and provides inputs for adjustments when they are required. The interactive control framework ought to animate the interest and discovering that make an association's new or developing procedures reasonable, not at all like the diagnostic control framework (Simons, 1995).

D. Conceptual Framework and Hypothesis Development

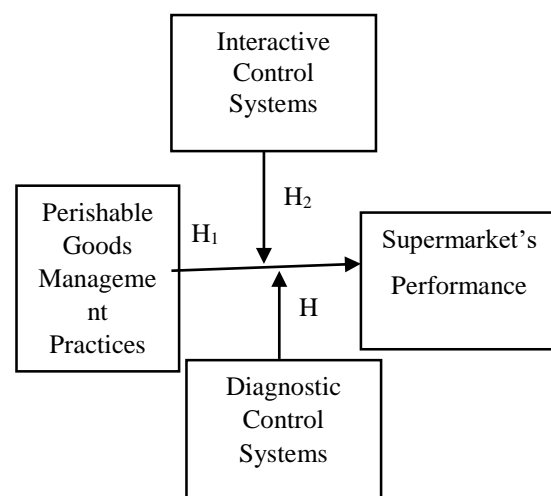


Figure 2. The conceptual framework of the study

Source: Developed by author

Figure 2 shows the conceptual framework and the proposed hypotheses in the study. The framework is conceptually grounded on the view of the firm and levers of control framework (Simons, 1995). We propose that the interactive use of MCS and the diagnostic use of MCS positively and negatively moderate the relationship between perishable goods management practices and supermarkets' performance, respectively. While the framework shows a direct perishable goods management practices between and supermarkets' performance.

H₁: *Perishable goods management practices have a positive impact on supermarkets' performance.*

When the perishable goods within the supermarket is in good condition it has a positive impact on the performance.

H₂: *The use of interactive control systems positively moderates the relationship between perishable goods management practices and supermarkets' performance.*

We propose that the use of interactive control systems acts as an internal contextual moderator to the relationship between perishable goods management practices and supermarkets' performance

H₃: *The use of diagnostic control systems negatively moderates the relationship between perishable goods management practices and supermarkets' performance.*

Researchers proposes that diagnostic MCS have negatively moderated relationship between perishable goods management practices and supermarkets' performance as it reflect characteristics of mechanistic and traditional control systems.

Data Collection

In this study, population is the total number of supermarkets located in Colombo Metropolitan Area. Based on limited resources the sample was chosen from the

all supermarkets in Colombo Metropolitan will consists of 50 supermarkets. The survey conduct by handing over a questionnaire among each supermarket in the selected sample. The questionnaire rating scale was the Likert format depicting responses on a scale of 1 to 7. "1" stands for "Not at all" and "7" stands for "To a great extent". There was basic information as demographic factors, educational qualification and working experience. They were designed in nominal and ordinal scale. Mainly there were four sub sets of questions which was built according to Likert format.

Data and Analysis and Discussion

A. Demographic profile

Regarding the position of the supermarket, the majority of the respondents were managers (48%) as well as around 36% were assistant managers and 16% were trainees contributed in this survey. This is very reliable information that 84% of respondent were managers. They are the people that having a considerable knowledge about the MCSs in the supermarkets. We sought to find out the gender distribution of the respondents and it was found out that 72% of the respondents were male representing 36 in number while female was 28% representing 14 in number according to survey. This is a reasonable sign that supermarkets situated in Colombo territory having higher portrayal of male representatives than female workers. The respondents were categorized into three groups under different age levels of 20-30, 30-40 and 40-50. Among them age group between 30-40 accounted for the majority (40%) of the respondents, and 34% of respondents are between the 20-30 age. The researcher sought to find out the working experience of the respondents and it was found out that 56% of the respondents were experienced 1-5 years.

34% of respondents have work experience more than 5 years. While 10% representing respondents who have experience below 1 year.

B. Correlation

Correlation coefficient (r) refers as a measure of the strength of the linear relationship between two variables. A positive correlation specifies that one variable increases the other variable also increase. A negative correlation shows that two variables are decreased (Bahna, 2009). Correlation value “1” indicates a perfect correlation and “-1” indicates an exact negative linear relationship. Based on the above results of correlation analysis, perishable goods and performance of supermarkets have positive correlation with other variables. The relationship between perishable goods and performance is 0.717 correlation coefficient. It is a high positive relationship. Then, the diagnostic (0.582) and interactive (0.212) control systems have positive relationship with perishable goods. Diagnostic (0.663) and interactive (0.219) control systems have positive relationship with performance. Therefore, diagnostic control systems have high relationship than the interactive control systems with perishable goods and performance.

C. Regression

In this study Multiple Regression analysis was used to verify the consequences or impact of many independent variables on the performance of supermarkets branches. As results of below Table 1.

Table 1. Model Summary

Model	R	R square	Adjusted R square	Std. Error of the Estimate
1	0.717*	0.513	0.503	0.3364

Source: Sample Survey (2018)

- a. Predictors (Constant): Perishable Goods
- b. Dependent Variable: Supermarkets' Performance

R2 value as 51.3% implying that the independent variable describes 51.3% of variance in dependent variable. This study dependent variable is performance while the independent variable is perishable goods. There is a 51.3% impact on the supermarket's branch performance from perishable goods. Not only perishable goods have an impact on performance, there are many variables which can make an impact on supermarket performance. Such as, employee empowerment, environmental factors, regulations and policies, personal beliefs.

The Table 2 is the ANOVA table that observed the overall regression model was significant under 95 % of confidence level. There are many criteria, but for this calculation only below stated criteria used. First one is to consider the “P” value, which is the significant value it should be below zero value. P can be described as the probability of finding the observed when null hypothesis is true. According to the results of ANOVA table, there can be so many independent variables, so out of them perishable goods seem to have a significant impact on supermarket's branch performance. It can be identified by $P < 0.05$. F test is based on ratio of variances and used to perform a test. It is computed at mean square.

As results of below Table 2 “F” statistics computed at 5.726 and at 5% of confident level. This results implies that the regression model is sufficiently significant.

Table 2: ANOVA

Model	Sum of square	df	Mean square	F	Sig.
1	Regression	7.382	2.461	30.012	0*
	Residual	3.771	0.082		

Source: Sample Survey (2018)

D. Moderate Variables

The purpose of this study is to examine the moderating role of the use of MCS on the relationship between managing perishable goods and supermarkets' performance. More specifically with reference to Levers of Controls (Simons, 1995), the study examines the diagnostic and interactive use of MCS on the relationship.

The extent to which supermarkets appellant proper management control systems to managing perishable goods have a positive impact on performance. Yet degree to which supermarkets adopt enabling and controlling use of MCS seem to moderate the above relationship. Below equation indicates that method of calculate moderate variable.

$$[MV1 = (d.v * p. g)], [MV2 = (I.v * p. g)]$$

- d.v – Standardized Diagnostic Variable
- I. v. – Standardized Interactive Variable
- p.g. – Standardized Perishable goods

Standardized regression coefficients are used for several purposes, selecting variables, deciding the relative importance of informative variables, examination the result of adjusting totally different variables etc. (Bring, 1994). In this study, we used standardized variables to examine the managing perishable goods toward the supermarkets' performance by adjusting different variables.

T" test used to compare means and check the different from each other. The Table 3 shows the t value and significant level of this study. "T" value should be "-1.97 < t > +1.97". That is the standard range of t value. There is a 7.117 of "t" value at 5% of level

confidence and it is greater than 1.97. In Table 3 model 2 measured the t value of all three variables as perishable goods, diagnostic and interactive control systems. T value of diagnostic and interactive control system were 4.436 and 2.952 respectively. Therefore, the "t" value all three variables are greater than +1.97. The standardized beta coefficient measured the strength of the effect of each independent variable to the dependent variable. In this study, independent variable is perishable goods as shown in the Table 3 and dependent variable is supermarkets performance. By this coefficient, variable can easily compared to each other. High degree of beta coefficient indicates a high contribution to the dependent variable from independent variable. Therefore, in Table 3 model -1 indicates .717 of beta coefficient shows the high contribution of managing perishable goods effect to the performance of the supermarkets.

In model 2 of Table 3 measured beta coefficient of all three variables as perishable goods, diagnostic and interactive control systems. According that calculations beta coefficient of perishable goods is. 354. Diagnostic and interactive control systems have .539 and .305 of beta coefficient respectively. Three variables have a significant contribution to the supermarket performance.

When considering the significant values of each variable all three variables indicates significant values less than 0.05 (p < 0.05) under 95 % of level confidence. The final results of regression analysis can be constructed by using all three variables that are influenced to the supermarkets performance.

This study found out that supermarkets are used diagnostic and interactive management control systems. The way these MCS are used and which extend to these MCS are factors that effects

supermarket's performance. Thus, we have analyzed the fact that diagnostic and interactive control systems have a positive impact on supermarkets' performance. Further, diagnostic control systems have higher positive impact than the interactive control systems were proved out.

Diagnostic control systems were identified as a negative impact on organization performance according to prior literature (Wijethilake et al.,2016). Hence, it was a surprising nature that we have identified that diagnostic control system brought out a positive impact on supermarkets performance. The reason for such an unexpected result is the study made on perishable goods. Perishable goods are

fresh produce, dairy products, meat and drugs etc. Their freshness, taste, status of quality and fragrance may depend on the controlling method (Siddh et al., 2015). Therefore, tight control systems are required in order to control perishable goods.

We have understood that rather than employ empowerment and decentralization, tight control systems play a major role in controlling perishable goods as per the account of studies. As a final point. having considered above facts, diagnostic control systems includes positive impact in controlling perishable goods towards supermarket performance than interactive control systems.

Table 3. Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	Constant	3.285	0.857		3.835	0.000
	Perishable Goods	0.441	0.147	0.354	3.002	0.004
	M Interactive C.S.	0.025	0.008	0.305	2.952	0.005
	M Diagnostic C.S.	0.045	0.01	0.539	4.496	0.000

M Interactive C.S = Moderate Interactive Control Systems

M Diagnostic C.S = Moderate Diagnostic Control Systems

Sources: Sample Survey (2018)

Conclusion

Perishable goods are one of the main component to be found in supermarkets. This study sort to answer the questions to what extent the MCS effects to perishable goods towards the supermarket performance All the more particularly, MCS play a significant job in (i) catching prevalent methodologies and assets by making new knowledge , (ii) making dynamic capacities, (iii) conveying inside in a more efficient and key way (iv) growing new items and administrations in a methodical and vital way (Simons 1990, 1995, 2000; Chenhall 2003; Henri 2006; Grafton et al. 2010).Further, the study also

focused on the Simons (1995) levers of control systems. We have concentrated only about diagnostic and interactive control systems out of four control systems in levers of control. Furthermore, it was examined that management of perishable goods and its effects to the supermarket performance.

The outcome result of the quantitative analysis was the identification of significant impact from perishable goods to supermarket performance. In light of these findings, not only interactive control systems but also diagnostics control systems both brought out a positive impact

in controlling perishable goods towards supermarket performance.

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