Research Paper Agricultural Science

The Role of Supply Chain and Executive Management Information Systems on Strategic Decision Making Among Tea Factories in Kenya

Simon Gitiba Gikang'a	Jomo Kenyatta University of Agriculture and Technology (JKUAT) - Kenya
Dr Fred Mugambi Mwirigi	Jomo Kenyatta University of Agriculture and Technology (JKUAT) - Kenya
Dr Moses Otieno	Jomo Kenyatta University of Agriculture and Technology (JKUAT) - Kenya

ABSTRACT

The purpose of the study was sought to bridge this pertinent gap in literature by establishing the role of supply chain and executive management information systems on strategic decision making among tea factories in Kenya. The study adopted a descriptive survey design. The target population of this study was all employees, management and directors of tea factories in Kenya. The study targeted 390 respondents and 284 questionnaires were properly filled and returned from the tea factory employees, which represents an overall successful response rate of 73%. To test reliability, Cronbach alpha was used to test the reliability of the instrument. The results were highly reliable and all the items appeared worthy of retention. Questionnaires were administered with the help of research assistants. Data was collected; questionnaires were coded and checked for completeness before data collected was entered in SPSS 20.0 for analysis.

The study findings indicated that the role of supply chain and executive management information system was statistically significant in explaining the strategic decision making among the tea factories in Kenya. Results also indicated that supply chain information management system had increased timely deliveries, reduced supply chain costs and has increased flexibility towards the customer demands.

The study concludes that only information technologies used for integration purposes will provide sustainable competitive advantage for the organizations within the supply chain. Effective relationships with customers and suppliers will directly lead to a higher level of supply chain integration and in turn lead to a higher level of operational performance for both firms and suppliers. Results led to the conclusion that the management information system was flexible enough to supports the growth of the factories and the management information system of the bank has been crucial in delivering innovative customer products and services.

The study recommends that that investment in Information technology be emphasized in the firms as it has an effect on the overall achievement of competitive advantage through strategic decision making. Therefore the organization is urged to invest in management information systems which are easy to use and which facilitate minimization of administration and operational costs. In addition, the companies should invest in management information systems that are compatible with other systems as well as the one that support the growth of the firms.

KEYWORDS Strategic Decision Making, Supply Chain Management Information, Executive Management Information

1. INTRODUCTION

Management information systems are very elemental improving company securities (Davenport & Short, 2008). For example, in many instances, most management information systems can be easily programmed by the owner to conduct certain actions at certain times. In effect, managers can program the system to perform certain routine checks which can help in improving efficiency of a company through easy discovery of bugs or problems. Furthermore, the programmability of most MIS saves a lot of priceless time and resources for owners. In other words, through programmability, business managers can program the systems to automatically discover certain deficiencies and even solve them.

With the development of information systems (IS) and information technologies the use of information sharing and decision making is growing at a very fast pace. Information Technology solutions are no longer likely to provide strategic advantage, but imply the business basics. The competitive advantage for organizations originates from development of creative information technology strategies and implementing them. Information systems enable existing strategies to be realized, Information flows provide the linkage that allows the supply chain to operate efficiently. Information technology is needed to handle routine transactions in an efficient manner. It can also play a critical role in facilitating the timely sharing of planning, production and purchasing information; capturing and analyzing production, distribution and sales data at new levels of detail and complexity. Information technology provides an integrating tool that makes it possible to convert data into meaningful pictures (Gabriel, 2013). However in the Kenyan tea sector industry there is low usage of management information systems thus slow decision making due to most processes being manual, bureaucratic, many levels of approval, incorrect data and many a times managers have to travel to their company's head office for any decisions to be made.

2. STATEMENT OF THE PROBLEM

Transition from industrial society to information and knowledge society has its impact on social, economic and cultural aspect of life. There are only few aspects of life nowadays which are unaffected by information technology. In recent years, information systems technology has become crucial and is playing a critical role in contemporary society and dramatically is changing economy and business. Business is conducted in a global environment and simply could not serve without computer based information systems (Lucey, 2005). Furthermore, we are entering the information age because of information technology and information systems usage. The use of information systems especially is often understood to be

changing the way business and organizations work as well as help managers reduce uncertainty in decision making.

Use of information technology, along with a variety of information systems that are designed for different needs is expanded. Information enables managers to make more and better connection with organization, the environment and each other. More participation in decision making, speed up decision making, increase the speed of identifying the issues, reducing the height of organization pyramid, Improve coordination and increase skilled staff, improve coordination and increase skilled staff, are just some of the impact that information technology and information systems have on some organization (Haag and Cummings, 2006).

According to Thompson and Beer (2000) in addition to more traditional systems which assist in the day-to-day business operations, information system is increasingly providing a competitive advantage for the organization. Several studies have found and reported diverse findings regarding information systems usage in decision making (Davis and Olson, 1985; Hicks, 1997; Kumar and Mittal, 2006; Jawadekar, 2008). Although decision making is one of the areas that information systems have sought most of all to affect, there have been only a few existing studies that have dealt and examined the role of information systems in management decision making. Lucey et al. (2005) and Haag and Cummings (2006) noted that information systems support decision making in organizations and vary among managerial levels. Information systems usage to support managers in decision making falls into one of two general categories of systems that help users to analyze a situation and leave the decision up to him/ her and systems that actually make some sort of recommendation concerning what action to take (Lucey, 2005; Haag and Cummings, 2006).

Companies have been investing heavily in information technology and systems so as to gain a competitive edge. This study is based on the premise that the passage of time and the very numerous and significant changes in the tea sector industry have led to totally different factors influencing the use of management information systems in the industry. Some studies attempting to shed some light on the subject under study are more generalistic and have failed to give detailed insights and analysis of the issues by the current study. This therefore leaves a knowledge gap that this study seeks to address on the role of management information systems on strategic decision making among tea factories in Kenya. So far no known study by the researcher has attempted to study the role of supply chain and executive management information systems on strategic decision making among tea factories in Kenya.

3. PURPOSE OF THE PAPER

The purpose of this paper was to establish the role of management information systems on strategic decision making among tea factories in Kenya.

3.1 Specific Objectives

The study was guided by the following specific objectives:

1. To establish the influence of supply chain management information system on strategic decision making among tea factories in Kenya.
2. To investigate whether executive management information system affects strategic decision making among tea factories in Kenya.

4. LITERATURE REVIEW

4.1 Supply Chain Management Information System

Supply chain management includes the methods, systems, and leadership that continuously improve an organization's integrated processes for product and service design, purchasing, inventory management, planning and scheduling, logistics, distribution, and customer satisfaction (Mentzer et al. 2001). These factors are more and more being accomplished in a collaborative manner across a network of linked business partners (Golicic et al., 2002; Barrat, 2004). Supply chain management issues can be classified into two broad categories: configuration (design-oriented) issues that relate to the basic infrastructure on which the supply chain executes and coordination (execution-oriented) issues that relate to the actual execution of the supply chain (Swaminathan and Tayur, 2003).

Configuration-level issues include topics such as procurement and supplier decisions (supplier selection, outsourcing decisions, procurement policies), production decisions (manufacturing sites, capacity allocations), distribution decisions (channels, distribution and retail locations, transportation issues), and information support decisions. Respectively, coordination level issues comprise material flow decisions, information flow decisions, and cash flow decisions. It is thus clear that supply chain management spans several functional and geographical areas, introducing complexities both in terms of design and execution (Swaminathan and Tayur, 2003).

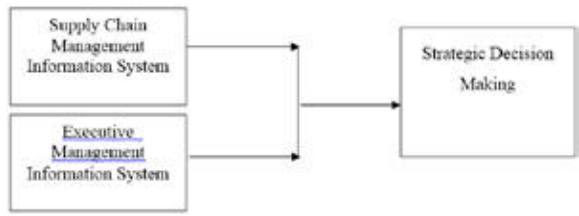
Experts believe supply chain integration involves efficient management of information and closer organizational coordination among supply chain partners. Lee outlines three dimensions of supply chain integration: information, coordination and organizational linkage. Information integration refers to the sharing of information and knowledge among the members in the supply chain, including sales forecasts, production plans, inventory status and promotion plans. Coordination refers to the realignment of decisions and responsibility in the supply chain. Organizational linkages include communication channels between the members in the supply chain, performance measurement, and sharing of common visions and objectives (Bagchi and Larsen, 2002).

4.2 Executive Management Information System

Executive information systems (EIS) are computerised systems that provide executives with on-line easy access to internal and external information relevant to their business success factors (Rainer and Watson, 2005). The aim of EIS is to bring information from the external environment and all parts of an organization and present it in a way that is meaningful to executive users (McBride, 2007). Nonetheless, the actual engagement or use of these systems by executives is relatively low (Young & Watson, 2005; Fitzgerald, 2008).

Nandhakumar and Jones (2007) witnessed an EIS development project in their in-depth study of the development methods in organizations where potential executive users were not involved in the design phases. As a result, they suggest that there should be better theoretical conceptualization of the dynamic relationship between the developers and executives to assist in understanding how the relationship shapes, and is shaped by various constraints.

McBride (2007) studied the progress of an EIS project within a manufacturing organization in the UK over a 9-year period. The study demonstrates the importance of the interaction between the business environment, the organizational environment and the perceptions and interpretations of events by stakeholders on the success or failure of EIS. Particularly, it illustrates the importance of the organizational context and the dynamic nature of the social, economic and technical factors critical in shaping acceptance and use of EIS in organizations.



5. METHODOLOGY

This study adopted a descriptive survey design. The target population of this study was all employees, management and directors of tea factories in Kenya. The tea factories which

constituted the population of study are 108 factories which are licensed by the Tea Board of Kenya for operation in year 2014. The study concentrated on only tea factories because it was expected that the players have the relevant and accurate information needed in this study. The sample was determined at two levels. The sampling was at an organisational level or tea factory level and the respondents' level. There are 108 tea factories and for the purposes of this study 30 factories were randomly selected as the units of study. To select the 30 factories, all the 108 factories were clustered into the eight tea growing zones. Three KTDA managed factories were randomly selected from each zone which adds upto 24 and the balance six were randomly selected from private run factories. This made up the 30 factories. This represents 28% of the 108 factories where as Mugenda and Mugenda (2003) and Gay (1981) recommend a 10% sample for a descriptive study.

A sample of 390 respondents was selected through stratified random sampling. The sample was distributed equally in all factories. Due to the rounding off of the distribution the sample has been rounded to the nearest decimal point leading to a sample of 390 respondents. The sample size was as laid on the sample matrix below on table 3.1

Table 1.1: Sample Matrix

Category	Sample Per Factory	Total Sample
Directors	2	60
Factory Manager	1	30
ICT Manager	1	30
Finance Manager	1	30
Operations Manager	1	30
Employees	7	210
Total	13	390

Data was collected, coded and analyzed using SPSS version 20.0. The findings were presented in form of tables and pie charts and discussions and interpretation of the same given.

6. RESULTS AND DISCUSSIONS

6.1. Response Rate

The number of questionnaires, administered to all the respondents, was 390. A total of 284 questionnaires were properly filled and returned from the tea factory employees. This represented an overall successful response rate of 73%. According to Mugenda and Mugenda (2003), a response rate of 50% or more is adequate. Babbie (2004) also asserted that return rates of 50% are acceptable to analyze and publish, 60% is good and 70% is very good.

6.2. Reliability Analysis

Cronbach's Alpha was used to verify the reliability of the proposed instrument. The findings indicated that strategic decision making had a coefficient of 0.746, supply chain management information had a coefficient of 0.869, and executive management information obtained a coefficient of 0.932. All the constructs depicted that the value of Cronbach's Alpha were above the suggested value of 0.7 thus the study was reliable and all the items were worthy retention (Kurpius and Stafford 2006; Cronbach, 1951).

Table 1.2: Reliability Statistics

Variable	Cronbach's Alpha	Comment
Strategic Decision Making	0.746	Accepted
Supply Chain Management Information	0.869	Accepted
Executive Management Information	0.932	Accepted

6.3. Descriptive Statistics

The first objective of the study was to establish the influence of supply chain management information system on strategic decision making among tea factories in Kenya. Results shows that 62.7% of the respondents agreed that their supply chain information management system had reduced the time in servicing customer orders, 67.2% agreed that their supply chain information management system had increased financial performance of the organization and 62% agreed that their supply chain information management system had increased customer service levels. Seventy four point seven percent of the respondents agreed that their supply chain information management system had increased timely deliveries, 75% agreed that their supply chain information management system had reduced supply chain costs and 77.4% agreed that their supply chain information management system has increased flexibility towards the customer demands. Finally, 62.8% of the respondents agreed that their supply chain information management system had increased inventory control and 70.8% agreed that their supply chain information management system had led to efficient information flow making it easier to make strategic decisions. The mean score for responses for this section was 3.76 which indicates that majority of the respondents agreed that supply chain management information system was a key determinant of strategic decision making among tea factories.

The second objective of the study was to investigate whether executive management information system affects strategic decision making among tea factories in Kenya. Results indicate that 85.3% of the respondents agreed that the organization has invested in a management information system which was easy to use, 73.6% agreed that the organization has invested in a management information system which has enabled the minimization of administrative costs and 79.6% agreed that the organizations management information system was compatible with other systems. In addition 77.8% of the respondents agreed that the management information system was flexible enough to support the growth of the firm, 80.2% agreed that the management information system of the firm has been crucial in delivering innovative customer services and 79.3% agreed that the management information system of tea factories has been crucial in assisting employees to enhance their performance and productivity. The mean score for responses for this section was 3.98 which indicate that majority of the respondents agreed that executive management information system was a key determinant of strategic decision making among tea factories.

7. MULTIPLE REGRESSION ANALYSIS

A multiple regression analysis was conducted to investigate the joint causal relationship between the independent variables which are supply chain management information and executive management information and dependent variable (strategic decision making). This is represented by the overall model $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + e$

The coefficient of determination R2 and correlation coefficient (r) shows that the degree of association between the independent variables and strategic decision making. The results of the multiple regression indicate R2 = .295 and R= .543 as shown in table 1.3. This is an indication that there is a strong relationship between independent variables; supply chain management information and executive management information and the dependent variable strategic decision making.

From the model summary table below adjusted R2 was .290; this indicates that management information systems explain 29% of variations in strategic decision making. Therefore further research should be conducted to investigate these other factors that affect strategic decision making in the tea factories.

Table1.3: Model Summary

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate
1	.543	.295	.290	.60044

The analysis of variance presented in Table 1.4 shows the F value of the entire of the regression model was 58.884 (2,281) P < 0.05. The significance value generated by the model was 0.000 this shows that the overall model is significant. It further implies that independent variables; supply chain management information and executive management information have a significant influence on strategic decision making.

Table1.4: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	42.458	2	21.229	58.884	.000
	Residual	101.308	281	.361		
	Total	143.766	283			

8. CONCLUSIONS

The results demonstrate that a higher level of information technology utilization will lead to a higher level of supply chain integration and firm performance through information systems integration. The results of this study further provide the empirical support that information systems integration acts as a bridge between the effective use of IT and the high level of coordination within the supply chain. It can be concluded that only information technologies used for integration purposes will provide sustainable competitive advantage for the organizations within the supply chain. Effective relationships with customers and suppliers will directly lead to a higher level of supply chain integration and in turn lead to a higher level of operational performance for both firms and suppliers. Moreover, relationships with trading partners will directly and indirectly influence firm performance through firm's and suppliers' operational performance. This is a very valuable finding since partner relationships have received little attention by top management.

The study findings led to the conclusion that executive management system was positively and significantly related with strategic decision making among the tea factories in Kenya. Following the study results, it was possible to conclude that information technology was highly emphasized in the tea factories. It was concluded that the factories have invested in a management information system which was easy to use and that the factories have invested in a management information system which has enabled the minimization of administrative costs. Results led to the conclusion that the management information system was flexible enough to supports the growth of the factories and the management information system of the bank has been crucial in delivering innovative customer products and services.

9. RECOMMENDATIONS

The results indicated that supply chain management information systems had an impact on strategic decision making of tea factories. This implies that top management should devote much study to technology investment strategies because investing in the wrong technologies can become a competitive disadvantage. Top management should pay much attention, resources, and effort to invest in technologies that have value toward external integration, thus improving supply chain integration. As a firm is continuously competing not only with other firms but also with other value chains, investing in technologies geared toward external integration will improve the entire supply chain. The competitive advantages from improving supply chain integration include enhancing information flow and improving operational performance (e.g., cost leadership, product quality, delivery speed, process flexibility, and technology innovation) because logistics activities are much more transparent.

The study recommends the need to develop accountinginformation systems to produce information in the companywhere thecriteria are basedInternational AccountingStandards (IAS) andInternational Financial Reporting(IFRS), which earnsaccounting information systemsoutput in the companymorecredibilityandjustice notonly in the local levelbutglobally. Adoption ofcorporate for accounting information systems as an essentialelement of thecompanyand to consider theoutputs of thesesystems arean important source fromthe company's resources ,which supports control proceduresand providesconfidence in thevarious reportsthat provides, which makes it imperativeto the company to exploit it for efficiency and effectiveness.

It is recommended that investment in Information technology be emphasized in the firms as it has an effect on the overall achievement of competitive advantage through strategic decision making. Therefore the organization is urged to invest in management information systems which are easy to use and which facilitate minimization of administration and operational costs. In addition, the companies should invest in management information systems that are compatible with other systems as well as the one that support the growth of the firms.

10. AREAS FOR FURTHER STUDY

A replica of this study can be carried out with a further scope to include other firms such asmanufacturing firms and see whether the findings hold true. Future studies should apply different research instruments like interview guide, focus group discussions to involve respondents in discussions in order to generate detailed information which would help in bringing out better strategies for decision makingin firms in Kenya.

REFERENCES

Bagchi, P. K., & Larsen, T. S. (2002). Challenges of Integration in Supply Chain Networks: An European Case Study, ACES Working Paper 2002.1 American Consortium on European Union Studies EU Center, Monroe Hall 403, Washington, DC 20052, USA | Barrat, M. (2004). Understanding the meaning of collaboration in the supply chain, Supply Chain Management, An International Journal, 9(1), pp.30-42 | Davenport, T. H., & Short, J. E. (2008). The new industrial engineering: Information technology and business process redesign. MIT Sloan Management Review. | Fitzgerald, B. (2008). Executive Information Systems without executives, Proceedings of the3rd conference of UK Academy for Information systems. Lincoln University, UK Mcgraw- Hill (288-310), in Avison.D. & Edgar Nevill D. (eds.) matching Technology with organisational needs. | Gabriel, J. M. O. (2013). The Systems Concept: An unpublished Lecture note giving to B.sc year 3 Students of Faculty of Management Sciences, Rivers State University of Science and Technology, Port Harcourt. | Gay, lr. (1981). Educational Research: Competencies for Analysis and Application. Columbus. Merrill. | Golicic, S.L., Davis, D.F., McCarthy, T.M. &Mentzer, J.T. (2002). The impact of e-commerce on supply chain relationships, International Journal of Physical Distribution and Logistics Management, 32(10), pp. 851-871 | Haag, S. and Cummings, M.(2006).Essentials of Information Systems, McGraw-Hill, New York. | Jawadekar. J. W. (2008). Management information systems: Texts and cases. New York, NY: McGraw Hill. | Kumar, P. K. (2006). Information System—Decision Making. IndianMBA. Retrieved December 2, 2014 from http://www.indianmba.com/Faculty_Column/FC307/fc307.html | Lucey, T. (2005). Management Information Systems. (9th ed.). London: Thomson Learning,. | McBride, N. (2007). The Rise and Fall of an Executive Information System: a Case Study, Information Systems Journal (1997) 7, 277- 287. | Mentzer J.T., DeWitt W., Keebler J.S., Min S., Smith C.D., Zacharia Z.G. (2001). What is supply chain management in Mentzer, J.T. (Ed.), Supply Chain Management, Saga Publications, Thousand Oaks, CA, pp. 5-62 | Mugenda, O.M. &Mugenda, A.G. (2003). Research Methods: Quantitative and Qualitative Approaches. Nairobi: Acts Press | Nandhakumar, J. & Jones M. (2007).Designing in the Dark: The Changing User-Developer Relationship in Information Systems Development, Proceedings of the Eighteenth International Conference on Information Systems, Atlanta Georgia, 75-89. | Rainer, Jr. R. & Watson, H.,(2005). What Does It Takes for Successful Executive information Systems?, Decision Support Systems (14), Elsevier Science B.V., 147-156. | Swaminathan, J.M. &Tayur, S.R. (2003). Models for Supply Chains in E-Business, Management Science, 49(10), pp. 1387-1406 | Young D. & Watson H. J., (2005). Determinates of EIS Acceptance, Information & Management 29, (153-164). Elsevier Science B.V.