

Effects of Information Communication Technology Integration on Supply Chain Performance at Aluminium Africa Limited in Tanzania

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Abstract: This study aimed at examining the effects of information communication technology integration on supply chain performance at aluminium Africa limited in Tanzania. The management and employees of ALAF Company limited were used as the target population. The study targeted 500 employees of ALAF Company limited but only 50 respondents were included in the sample population and stratified random sampling was used to select the sample size. Questionnaires and interview questions were the major instrument for data collection. The quantitative data was analyzed by using Statistical Package for Social Science (SPSS) version 20. Correlation analysis was employed to establish the relationship between variables of the study. ICT integration had a significant contribution to supply chain performance at aluminium Africa limited. The study concluded that the firm should be integrating ICT strategically by embedding it with core activities of the firm.

Keywords: Information Communication Technology, Integration, Supply Chain, and Performance.

1. INTRODUCTION

There are many reasons why manufacturing firms start a supply chain sustainability journey. Primary among them is to ensure compliance with laws and regulations and to adhere to and support international principles for sustainable business conduct (S. Vachon & Klassen, 2008). Since it is no longer enough for firms to be concerned only with seeking a profit, they should also give something back to society at large, minimize their negative impacts on the environment and have some responsibility for the behaviour of their supplier on issues such as child labour, health and safety and pollution (Walker, Di Sisto, & McBain, 2008). Moreover, there is significant evidence of the increase in the number of consumers concerned with understanding the conditions under which products are produced, and their desire that the products are produced in a sustainable manner (Wolf, 2011). Also, there has been increasing interest on how organisations address sustainability in their supply chains, which has been described as supply chain practices that incorporate the triple bottom line of sustainability that is social, economic and environmental elements; where by sustainable supply chain incorporates a variety of concepts such as environmental or green supply chain where firms seek to minimize negative environmental impacts in their supply chains (Walker and Jones, 2012). Thus, this is reflected in the growing emphasis on life cycle management, where supply chains rather than firms are held accountable for a product or service's external impact.

2. STATEMENT OF THE PROBLEM

Adopting sustainable supply chain practices has become an increasingly important issue for the industry, government and academic researchers. In today's dynamic business environment; competitive pressure and customer demand are forcing manufacturing firms to shift their priorities to understand the sustainable supply chain practices in order to deliver superior value products to customers (Wilding, Wagner, Miemczyk, Johnsen, & Macquet, 2012). According to (Hasan, 2013) argued that it is important for manufacturing companies to take steps to measure their supply chain emissions in order to predict future cost and liabilities; since to combat with increasing energy prices and reduce in-house emissions,

40% of the firms have invested in on-site renewable energy generation, 63% view sustainability as an opportunity for revenue growth, 71% view reputation and brand as the area where sustainability, green and carbon issues will provide opportunity and 44% are confident that they can deal with sustainability issues. However, sustainable supply chain practices addresses the challenges of sustainability risks, opportunities and trade-offs from a business and value chain perspective by bringing upstream (input) and downstream partners (output) into the boundary of investigation and management to improve sustainable performance of supply chain (Brandenburg et al, 2014). Despite the fact that sustainable supply chain practices contributes to sustainable performance, sustainability issues in supply chain are often neglected or partially addressed and the transdisciplinary teams of knowledgeable experts needed are absent or at best separate rather than integrated with mainstream information and management systems (Burritt and Tingey-Horyoak, 2012). Not only that but also, manufacturing firms continue to be caught employing child labour, polluting and in other ways compromising their sustainability commitment (King et al, 2005). In Tanzania, few studies have been done towards supply chain management (Msuya, 2007 and Ruteri, 2009) but none of the studies has tackled sustainable supply chain practices in manufacturing industry. Therefore, this study intends to analyze the effects of information communication technology integration on supply chain performance at aluminium Africa limited in Tanzania.

3. LITERATURE REVIEW

Due to rapid development in the use of ICT in supply chain management today is being applied in many organizations in a wide range and operations areas. It has provided new ways to store, process, distribute and exchange information both within companies and with customers and suppliers in the supply chain (Kollberg & Dreyer, 2006). In supply chain management, ICT has especially been recognized as an enabler for information sharing which companies in the supply chain can use for eliminating bullwhip-effect (Lee et al, 1997). Information sharing is a key component in many of the recent automatic replenishment programs (ARP) (Daugherty et al, 1999). Initiatives such as Vendor managed inventory (VMI), Enterprise resources planning (ERP), Collaborative planning, forecasting and replenishment (CPFR) are based on an increased level of automation in both the flow of physical materials and goods and the flow of information between companies to improve the efficiency in the entire supply chain (Kollberg & Dreyer, 2006). However, Arntzen et al, (1995) claimed that the importance of ICT in supply chain management is demonstrated by the number of companies that have designed and implemented new information systems and technologies for supply chain management. ICT are meant to pervade the whole supply chain, integrating not only the functions and processes of a single company, but also those of suppliers with broad and long term implications for an organizations competitive advantage. Christopher (1997), underlined that the fundamental concept is that organizations in the chain seek to create additional customer value through the exchange of information. Such a process can be referred to as the value-added exchange of information since value is created by the management of two main flows within the supply chain, namely the flow of information and the flow of materials and goods. Pontrandolfo and Scozzi (1999), noted that ICT directly affects the management of information by reducing time and cost to manage and transfer information and improve its quality. ICT in the supply chain is often expressed in terms of company performance such as efficiency and effectiveness (Kent and Mentzer, 2003; Sanders and Premus, 2005). ICT is considered to have a positive impact on both internal and external collaboration is a further driver of internal collaboration (Sanders and Premus, 2005). ICT is expected to contribute to improved communications patterns, an increased demand for coordination of joint activities and new organizational and societal structures through its ability to store, transmit and process information and speed up inter organizational activities (Sriram and Stump, 2004). Therefore there is significant amount of research demonstrating a positive impact of ICT in the supply chain. As companies seek to improve the efficiency in the supply chain through increased integration since ICT is considered as a key enabler for supply chain management through its ability to support information sharing and shortening information processing time.

4. RESEARCH METHODOLOGY

This study adopted a descriptive research design. In this case, the total target population for the study was 50 respondents from Aluminium Africa limited. For this study the sampling frame included top level management, middle level managers and operational staffs of Aluminium Africa limited. For qualitative data the researcher used purposive or judgemental sampling technique for the purpose of obtaining information from specific target population, since judgemental sampling enables the researcher to apply his/her judgement when selecting cases that answers the study research questions and meet the intended research objectives (Kothari, 2004). For quantitative data the researcher used stratified random sampling.

5. FINDINGS

The study sought to establish the level of agreement or disagreement with statements on ICT integration and chain supply performance. From the findings 75.2% of the respondents agreed that ICT integration affect supply chain performance whereas 24.8% of the respondents were of the contrary opinion. Majority (82.5%) of the respondents agreed that ICT Integration is dependent on the factors that influence supply chain performance whereas 17.5% of the respondents were of the contrary opinion.

Table 1. Agreement of statement on ICT integration

Statement	Yes	No
ICT integration affect supply chain performance.	75.2	24.8
ICT integration is dependent on the factors that influence supply chain performance.	82.5	17.5

Table 2. Descriptive statistics on ICT integration construct

Descriptive statistics on ICT integration construct

Statements on ICT attributes	Rank	Mean	Standard deviation
ICT facilitates the firm to reduce environmental waste through clean disposal.	1	2.62	1.052
ICT is used in designing of products in order to ensure easy recycling of products.	2	2.42	1.039
ICT used reduces lead time.	3	2.30	1.129
ICT used leads to increase in the order size.	4	2.12	0.849
ICT enhances quality products and services to the customer.	5	2.08	0.944
ICT used speed up the product development process.	6	2.08	0.877
Information system is used to facilitate timely response to customer needs.	7	1.96	0.807
Latest technology is used to increase production level.	8	1.86	0.782
ICT used enhance information sharing so as to provide quality services.	9	1.76	0.822

According to likert scale, 1.0-2.4 represented agree; 2.5-3.4 represented neutral and 3.5-5 represented disagree. From table 10, the attributes of the ICT integration construct have been ranked in the order of their importance to the contribution of supply chain performance starting with the least to the highest important. The study was investigating the respondent's opinion on statements about ICT integration in regard to supply chain performance. From the findings the respondents were neutral that on the statement that the firm uses ICT to facilitate the firm to reduce environmental waste through clean disposal as shown by a mean of 2.62 and a standard deviation of 1.052. The respondents agreed that measuring the supply chain performance the firm uses ICT to reduce lead time, increase order size, quality services, speed, timely response, increase production level and in enhancing information sharing with a mean of 2.30, 2.12, 2.08, 2.08, 1.96, 1.86, 1.76 and a standard deviation of 1.129, 0.849, 0.877, 0.807, 0.782 and 0.822 respectively. The study established that there is no positive relationship between ICT integration and supply chain performance. This implies that ICT integration has no significant contribution to supply chain performance at Aluminium Africa limited since its contribution to performance was low compared to other factors. Hence the organization has to concentrate more on other factors that contribute to performance of the organization. However, this finding disagree with Annon (2005) who found out that technology and innovation have increasingly emphasized the importance of effective business processes in optimizing the flow of value to the customer and leading to efficiency in supply chain performance. This finding also disagree with Kannan and Tan (2006), who found out that companies exploit capabilities and technologies of their key suppliers to enhance efficiency and effectiveness of their supply chains.

6. CONCLUSION AND RECOMMENDATIONS

Although the findings of the study has shown that there is no positive correlation between ICT integration and firm performance but in reality there is no organization that can survive successfully without ICT integration. Hence in order for the firm to pursue cost reduction in the supply market, buying firm need to enhance productivity through ICT integration and ensure automated procurement system based on e-sourcing strategies for cost minimization. Therefore, it is recommended that for a firm to attain optimal performance they should not use ICT for the sake of it but they should use ICT strategically by embedding it with core activities of the firm that facilitate further performance of the firm.

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