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IMPACT OF E PROCUREMENT AND LOGISTICS ON EFFECTIVENESS OF SUPPLY CHAIN MANAGEMENT: A STUDY OF AVIATION INDUSTRY IN PAKISTAN

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ABSTRACT

The principal objective of this study is to identify and evaluate the potential solutions to the problems in the traditional supply chain management in the Aviation Industry of Pakistan. The role of technology with Supply Chain Management is also discussed in this study. The data was collected from various Airline companies in Pakistan. The results indicate that e procurement and logistics are vital for supply chain effectiveness in aviation industry of Pakistan. Specific recommendations and implications are also discussed.

INTRODUCTION

Supply chain management (SCM) moves from designing, implementing, and evaluating the flow of raw materials, products, and information among multiple companies in the industry. The major actors in this flow are suppliers, manufacturers, wholesalers, and retailers who are all involved in business processes like procuring, producing, and delivering products. Supply chain management is an exploding field, both in research and in practice . The management of supply chain activities can differ greatly from management activities in traditional manufacturing supply chains (Gunasekaren, Macbeth, & Lamming, 2000). It has been observed that supply chain has become an essential part of businesses after organization have started making knowledge based strategies.

Supply chain needs new and innovative ideas for their processes and the new organizational structure to ensure that they have been released with complete potential. In order to maximize returns from the supply chain process, re-engineering and designs will have to take place (Pretorius, 2001). Implementing a code of conduct across a supply chain is a complex process that companies are still grappling with, yet some have made more progress than other. Buyer-supplier relationships are becoming important with the increasing cost of materials purchased (procurement) as a proportion of the total sales volume (Anupindi & Akella, 1993). By this it means that businesses are feeling the pressure to improve procurement effectiveness, and a focus on strategic sourcing and hosting offerings is becoming a popular first step. E-procurement point solutions are fading, yet companies still want to protect procurement investments. In this we are also focusing on the enhancement of the procurement process and going towards E-procurement. Logistic is actually elaborated as the means of transportation of certain products. Regardless of the logistic evaluation tool that is used by an organization to assess the quality of its logistic service, it is important that one such tool is indeed used, to allow improvements to be internalized, as it already happens with processes in other areas of the company (Graeml & Peinado, 2009). Talking of technology, the ERP has obtained good results and productivity of organizations. Its success could be measured as "The interest in ERP system is growing" (Rell & Basel, 2010, p.831) The benefits of ERP modules include increased sharing of data, information flow and data security (Moller, 2005). The collection of module in ERP is based on the need and preference of the organization. (Alanbay, 2005).

Previously no significant research is conducted in Pakistan regarding SCM in aviation industry. So this study is an attempt to generate awareness about this important under-researched area. Majority of studies have been conducted in developed countries but not in Pakistan, where the context is very much different because of business priorities and needs.

LITERATURE REVIEW

Supply chain management

A supply chain encompasses all activities associated with the flow and transformation of goods from the raw material stage (extraction), through to end users, as well as the associated information flows both up and down the supply chain. A supply chain can therefore be viewed as the formation of a value chain network consisting of individual functional entities committed to the controlled sharing of business data and processes, to explore the level of supply chain integration construct and its dimensions and to determine the feasibility of measuring a case's level of supply chain integration (McLaren, 2006). An important lesson in supply chain management research is that firms should consider global supply chain perfonnance, and not just the performance of their portion of the chain. Firms strive to adapt their supply chains to the e-business environment. They need to decide how much and in what sequence they will be investing in various supply chain efforts to leverage the benefits of the new technology.

Simple supply chains indicate that it may be costly for some members to manage their inventory in a completely synchronized fashion with the whole chain. According to the findings of this study, joint problem solving, open communication and timely information are an integral part of the relationship. Risk and benefit sharing and the integration of systems were seldom part of the relationship (Weiss, Fourie & Nel, 2002). Determining detailed skills for future professionals in the area of supply chain management reduces the potential training costs for companies and reduces the gap between academia and business (Gonzalez, Quesada, Gourdin & Hartley, 2008). In the next two years, there will be a further increase in electronic methods of purchase and in the selling of products and services through the internet; it is not, however, to be expected in the near future that the supply chain will be subject to comprehensive integration permitting simultaneous planning steps to take place. Determining detailed skills for future professionals in the area of supply chain management reduces the potential training costs for companies and reduces the gap between academia and business (Gonzalez, Quesada, Gourdin, & Hartley, 2008). The Internet provides a tool that allows supply chain activities to be carried out in a synchronized, instantaneous manner, facilitating maximum supply chain performance. Internet is a supply chain management tool that can be used to improve customer satisfaction, reduce costs, smooth production flows and shorten cycle times.

Supply chain management emphasizes the potential advantages of establishing linkages that can orchestrate suppliers and customers in the entire supply chain. (Baihaqi, Beaumont, & Sohal, 2008). The interactions of these variables and their relationship with supply chain perfonnance culminate in the fonn of the contingency based framework that can be used to analyze e-supply chains. To exhibit the applicability of the framework especially as an aid in decision making, an e-supply chain simulation framework is proposed. (Mukhtar, Jailani, Abdullah, Yahya & Abdullah, 2009). The concept of ERP seems to be growing and expanding. It will be useful to investigate topics such as how the companies using the ERP system perceive this trend (Moon, 2007). Multinational organizations benefit from supply chain support. Supply chain linkages induce a need for many small organizations to acquire ERP support, often constrained to match systems of the core supply chain firm (Olson Sheu & Chae, 2005). The richness of structural properties in supply chain architecture provides unique ways of representation of structure, infonnation, and process flow in the enterprise. (Chandra & Kumar, 2006). The core idea is that the successful implementation of SC integration projects is not as much a technological problem and that a thorough study of the current and desired states of business processes in all companies involved is required (Trkman & Groznik, 2006). While improved supply chain management principles combined with new information (e-business) technologies may not have been given much macroeconomic attention in the past, its effective implementation can help firms reduce costs, increase revenues, boost efficiencies, and expand market opportunities. Today it is expanding in breadth and depth alike. More companies are opening Internet channels and more buyers are ordering over the Internet. Also, applications are getting more sophisticated. For example, industry exchanges do not only handle transactions, but also generate data. Companies that consider adopting an integrated information system should replace the question "which is the most effective implementation strategy?" with the more appropriate one "which strategy best fits the business requirements of our organization?" (Masini, 2003). The researcher wants to elaborate the benefits of this system because ERP can then be expanded to other sectors of the business. It was also discovered that an online web¬ based quotation system would attract lots of customers since no company in Pakistan is offering such a service, which can be offered at a very low implementation cost (Baray, Hameed, & Badii, 2008). Here the researcher wants to say that the most important issue in a successful ERP project is an understanding the working of the company's business and all of their context requirements. (Ojala, Vilpola, & Kouri, n.d.)

E- Procurement

Havingthe ability to supply the procurement demands for modem weapons thus involves very substantial resources on the part of the vendor. There are no incentive conflicts among the supply chain's firms, and firms choose rational procurement policies. The Anns could

let the supplier control the supply chain's reorder point policies, subject to the constraints that all players are no worse off and any potential savings are shared (Cachon, 2001). The firm should adjust its cash reserves and its inventory levels at various stages depending on recent realization of demand (Hu, 2006). Information sharing allows the supplier to identify which retailers have the highest need for replenishments. One of the basic problems which are being faced by the organizations is the improper flow of information between two or more parties. If the information given or received is wrong then there would be a lot of errors in the process. This means that the organization should introduce the ERP systems to reduce the error possibility. For information sharing to be useful, the information shared should not be inferential by the receiving party using any of the available data (Raghunathan, 2001). An information-rich supply chain system under incomplete knowledge of the system parameters is important (Aviv, 2003). This research recognizes information flow as the biggest cause for bottlenecks in supply chains and proposes a model that will provide the necessary visibility and flexibility to the system.

Technology, being the important part in this include the ERP software like SAP. The concept of supply chain management (SCM) helps the companies in the environment to achieve effective enterprise integration (Gunasekaren, Macbeth, & Lemming, 2000). ERP is a key tool for obtaining information of day to day business processes for making the decisions; therefore, ERP becomes a key factor for operations productivity (Guo, Wang, & Luo, 2006). The SCM actively interlinks the ERP system like warehouse, logistics, procurement, distribution channels, marketing and sales that directly involve value adding in supply network (Selk, Kloeckner, & Albani, 2006). The "plug and play' is the concept of technology use for specific solutions for specific problems which could be easily added to an existing ERP environment. ERP provides base for knowledge management, which helps in decision making while problem solving. (Guo, Wang & Luo, 2006). According to Zile (2004); "ERP system support many knowledge management functions and persuade knowledge management proposal in an organization". The accomplishment of ERP is key tool for the productivity of available resources. (Rell & Basel, 2010). The ERP System allows enhancing the coordination in term of data base management and functionality of all functional areas "sales, service, marketing, procurement, production, logistics and waste disposal, which are directly involved in the value creation process. (Selk, Kloeckner, & Albani, 2006). The basic use of this software in the department of many organizations, particularly multinational companies, is to improve the efficiency of their organization. ERP Modules are made for different departments, Human resource, Supply Chain management, Customer Relation management, Stock and Procurement. In this way this software increases the overall efficiency of the organization." (Belbag, Cimen, Tarim, & Tas, 2009).

Hypothesis 1. E-Procurement has a positive effect on the Supply Chain Management.

Logistics

The implementation of logistics as managerial concept and practices in manufacturing companies is the most important indicator for the development of logistics in the economy as whole. (Guo & Tang, 2008). For example, IBM has used AMT to address a wide range of business issues, including inventory management, supply-chain configuration, product structure, and replenishment policies. Asset Management Tool has become the foundation for a number of supply-chain-reengineering initiatives. Through which we can further communicate with the Logistics Cost. We examine the drivers of current customer profitability in a supply chain for a large distributor with a heterogeneous client base (Niraj, Gupta, & Narasimhan, 2001). This actually means that on one hand, a small percentage of customers contribute to a large percentage of total profits, and on the other hand, a substantial percentage of customers are unprofitable. Speed to market is slightly more important than cost when choosing a sourcing region; however, due to new and innovative logistics systems, proximity is starting to become less of a benefit offered by US and South/Central American suppliers (Cesca, 2005). Companies need to analyze both the first cost and total cost of a good before choosing a supplier for sourcing (Cesca, 2005). The novel features of our model include dual modes of supply for dealer replenishments and net customer demand that is responsive to speed of service (Rao, Wolf, and Tayur, 2000). Transportation costs are a function of market type, location within the supply chain and proximity to market (Cesca, 2005). The costs of the regulated carriers are high because the price level is high, and not the reverse (i.e., cost is price-determined, not price-deter-mining). All activities involved in the construction process within the implementation logistics should be built around cross-functional teams, and everyone should be involved right from the start when implementing the advanced technologies. This means that there is no single department which deals with the suppliers but everyone in the organization should know who the suppliers are, what is the channel and what kind of technology is being used during the process. Overall, transportation and inventory holding costs are important

factors in a retail company's strategy; however only minimization of inventory holding costs enhances its performance (Cesca, 2005). Companies in the petroleum industry have become increasingly reliant on the services of third-party logistics companies to manage their supply chains.

Hypothesis 2. Logistics has a positive effect on the Supply Chain Management.

RESEARCH METHODOLOGY

Sample and Instrumentation

Total of 200 questionnaires were distributed in the three main airlines operating in Pakistan. Out of 250 questionnaires 217 questionnaires were received which were completely filled by the customers; hence the response rate was 86.8%.

The data was collected in Non-contrived environment. It means that natural working environment was not disturbed, which shows that the researcher is having minimal interference. The respondents were requested to fill up a questionnaire that asked questions about how much important to them is the concept of Supply Chain Management with the determinants (E-Procurement and Logistics) and their effect on the overall organization. Managers and Senior Employees were requested to help in data collection and to ensure that proper answer were given to the questionnaires and also to illuminate any concerns or problems faced by the respondent in understanding the questionnaire. Almost all the conscientious people were supportive in this regard. It was also assured that all the information filled in by the respondents would be kept confidential.

The alpha for the Supply Chain Management is 0.906 which means 90.6%. E-Procurement has the alpha of 0.889 which make this part 88.9% reliable. Third is the logistics which has the alpha of 0.783 means that it is 78.3% reliable.

RESULTS

TABLE 1
Correlation Analysis

Variable	1	2	3
1. SCM	1		
2. Procurement	.433**	1	
3. Logistics	.425**	.284	1

The Correlation Analysis shows that Supply Chain Management was strongly related with E-Procurement (R = 0.433, S = 0.00). As it showed that there is a strong link between the product E-Procurement and the Supply Chain Management which is (43%) gives us the indication that the E-Procurement has the (43%) share in the development of the Supply Chain Management. Furthermore we also came to see that there was a significant strong and positive relation of the Supply Chain Management with the Logistics that is (r = 0.425, p = 0.00) which makes it (42%). This finding of the logistics shows that it is almost as important as the E-Procurement but the correlation values is less than E-Procurement because at Procurement level the strategically decision making is being done.

TABLE 2
Regression Analysis

	Beta	t	sig
E procurement	.36	5.650	.000
Logistics	.392	5.445	

R Square= 0.287, Adjusted R Square= 0.28, F=42.99, n =217

DISCUSSION AND CONCLUSION

As we know that the objective of this article is to identify and evaluate the potential solutions to the problems in the traditional supply chains in the Aviation Industry of Pakistan. For this we selected the main Airlines Companies of Pakistan, which includes: (1) Pakistan International Airline (2) Air Blue (3) Shaheen Airlines.

All of these organizations are running successfully in Pakistan and because of the less choice for customers, the competition is always high. To attract the customers, these companies are always trying something new. But before the customer we have to see whether there is coordination among themselves or not, which means it is important to know what are their processes of doing business internally and how do they integrate within the organization. We did a brief investigation on the Supply Chain Network of these organizations for which the variables selected were E-Procurement and Logistics of the Organization. These organizations used the traditional way of procurement, first generating requirement, then asking different vendors for bidding. This was one of the lengthy process for which they have to wait for the response of the vendor. This was all done by their old information management system which is less efficient. The result shows that the E-Procurement can play a vital role in the enhancement of the complete Supply Chain Network. The results show the significance of (0.443) which is highly positive because by putting ERP or technology in Procurement process it will give you Centralized information, which means that all the

information can help you in process will be available at one point. ERP contain collection of modules such as, production, inventory, Procurement, Sales, Marketing, and Accounting (Chima, 2007). Every single time the information is readily available information. The time of the one complete process is also improved which, in other words is known as Improved Lead Time. They could just integrate between the departments. Financial reporting will also increase though the data between all the departments will be known. Time will be saved due to analytical reporting. Inventory cost reduced company can invest that money onto some other project then this. Master data can be easily maintained, which is centralized for the facilitation of company. The benefits of ERP modules are such as, Increase Sharing data and information flow, Data Security (Moller, 2005). The Selection of module in ERP is based on the need and preference of the organization (Alanbay, 2005). Cost effectiveness will increase, this means extra costs will be reduced, for example, things which are not required for some specific time, it's better not to order for them till the need arises. Quality will increase and will result in the satisfaction of the end user. Better and efficient management will develop. Extended information will be available e.g. marketing employees can get the data of finance for future planning.

System transparency means error free transactions will be done. Single entry data means that the data will have to be entered only once, then it can be retrieved at any time. The ERP provides exact picture of stock and demand which is core activity of SCM. ERP Software could do stock tracking and demand estimation" (Belbag, Cimen, Tarim, & Tas, 2009).

The second Variable is as important as the first one because it also shows the significance of (0.434). Logistical behaviors are the fundamental functions that have to be performing in any logistics system. It is vital to distinguish that they are the components of a true system, in that they are all unified. Very often a change in one will create a wave effect of change throughout the whole organization. The reason for which the logistic is as important as E-Procurement is because with the technology, the Logistics would raise your output and efficiency. This means that through an outsourced supply chain, you can focus on your center business activities and reduce or eliminate your money investment in non-core area such as tools and conveniences. In addition get pleasure from belief and dependability with an established track record and a remarkable customer selection.

Due to its importance the ERP system is considered a competitive edge between the competitors. The ERP has been proved a key tool for the productivity of available resources. The ERP provides the best solution of problems being faced in SCM. This automotive system controls and reduces the cost and enhances the production. The ERP System helps in product planning, parts purchasing, maintaining inventories, interacting with suppliers, providing customer service, and tracking orders. This software is being used by many organizations to improve the efficiency in different departments like Human resource, Supply Chain management, Customer Relationship management, Stock and Procurement. The ERP system provides helps in internal organization connectivity and everyday business process. The benefit of ERP is to increase sharing in data and information flow, which helps in decision making in the organization.

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