

E-Business Processes and its Influence on Supply Chain performance: In the Context of Indian Automobile Industries



Sumit Chandak, Neeraj Kumar

Abstract: Supply chain encompasses the organized structure of institutions and organizations the purpose of which is to create products or provide services, raw material, work in progress material, and finally finished product to end users. This paper represents influence of e-business processes in improving performance of supply chain (SC) in context of Indian automobile Companies. This paper will help automobile companies to implement E-Business Processes to achieve better SC performance. This research tries to investigate impact of E-Business Processes on performance of SC of Indian automobile industries. In order to achieve this objective independent variable inventory management, logistics performance and information flow are tested over cost reduction and strategic gain as dependent variable. This study investigate that sample automobile companies attentive towards e-business processes, the sample automobile companies exercise e-business processes in operation of their supply chain and results shows that their supply chain is influence by development of e-business processes (inventory management, logistics performance and information flow). This research shows that practice of e-business processes is very important to achieve strategic gain and to cut of overall supply chain cost, which improves SC performance in context of Indian automobile Companies.

Index Terms: E-Business Process, Information technology (IT), Supply chain performance, Supply Chain (SC).

I. INTRODUCTION

In e-business model there is association of end users, supply chain partners, distributors, suppliers, and management in which stream of man, machine, money, information and products which flows back and forth throughout the supply chain. Proposed model indicates influence of E-Business Processes on SC performance of Indian automobile industries by conduction of business transaction through internet. Proposed model based on e-communication and e-transaction of supply chains that added value and excellence for operation of SC management. Coordination amongst the various entities of Supply chain and effective communication between them is key responsibility of Supply Chain Managers (Simchi-levi et al., 2008). E-business processes play a cost effective tool for

integration of supply chain. It is reengineered SC and scrutinizes speedily sprouting research in this field (M. eric Johnson and Seungjin Whang). Adoption of information technology tools in management of SC improved performance of SC drastically which created high level of proficiency in supply chain integration and added value in entire supply chain. E-business defined as “the way of doing business by using Information technology as a tool” (Dubelaar et al., 2005; Hertwig, 2012). E-business processes is Software based technological process which grouped staff members, managers, manufacturer, distributor, logistics provider and end user, the objective is only to add value in supply chain (Duplessis and boon, 2004; Lai et al., 2012). The application of information technologies has proved greater impact on supply chain performance (Lee 2000) to maintain association (Saraf et al. 2007). E-business processes implemented in management of SC contains following

1. Use of Information technologies (IT)
2. Internet based SCM System
3. Electronic Data Exchange
4. Mobile Applications
5. Mail Order Management
6. Radio Frequency Identification (RFID)
7. Enterprise Resource Planning (ERP)
8. Management Information System (MIS)
9. Logistics Information System (LIS)

With the help of these tools the organization can improve information flow, delivery time, customer satisfaction and operational efficiency-Business Process is an information bases tool to improve performance of SC in totality. This tool optimizes the entire process of Supply Chain with improved efficiency. Logistics is key element of SC. With help of latest transportation tools product delivery efficiency improved up to great extent. Accurate and precise management of Inventory lead to improved performance of Supply Chain. The incorporation E-Business Processes in inventory management creates greater value addition in Inventory Management and will improve efficiency of Inventory Management, which will leads to enhance performance of SC. IT plays a very key part as enablers of efficient SC Management (Jack et al, 2006) and this will create more alertness in Supply Chain. Fast and improved delivery increase customer satisfaction which is an important enabler of improvement in SC Performance. Lead time reduction, reduction in stock, improvement in order tracking and improved flow of information will reduce cost of inventory which will leads to improvement in Supply Chain Performance.

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Flow of Information plays a key part in SC Management. Management of SC required continuous sharing of Data and Information across all entities of SC. Better communication will improve Supply Chain Performance.

A. Statement of The Problem

For almost every business use of technology is very essential in present scenario. In future use of technology will increase. In overall performance of organization SC plays a curtail part. By using conventional SC it is not possible to handle market demand in present scenario and almost every organization is facing competition in present era. E-Business provides uprising changes in Supply Chain Management and creates strong and smart Supply Chain (Vishal Vikramsinha Jadhav, 2015). E-Business Process is changing all way of Supply Chain operations. It has ability to predict, calculate and transfer data precisely and accurately because of inbuilt logical mathematical software and hardware. Because of this calculation power human being are using technology in exponential rate. This research outlines the Influence of E-Business Processes in Improving Performance of Supply Chain of Indian Automobile Industries. This will helps Automobile Industries to figure out blueprint for implementing best E-Business practice to achieve best performance of SC. The primary question of this paper is "What is Influence of E-Business Processes in Improving Performance of Supply Chain of Indian Automobile Industries?"

In order to justify this primary question is divided in to three sub questions:

1. What is influence of E-Business Processes in improving Inventory Management, which leads to reduce cost of Supply Chain and improved strategic gain in Supply Chain?
2. What is influence of E-Business Processes in improving Logistics Performance, which leads to reduce cost of Supply Chain and improved strategic gain in Supply Chain?
3. What is influence of E-Business Processes in improving Information Flow, which leads to reduce cost of Supply Chain and improved strategic gain in Supply Chain?

B. The Aim of The Research

This paper shows the influence of E-Business on SC performance in context of Indian Automobile Companies.

1. To determine influence of Inventory Management on SC performance.
2. To access the influence of Logistics Performance on Supply Chain performance in context of Indian Automobile Industries.
3. To determine the influence of communication on SC performance in context.
4. Key aim of paper is to identify the influence of E-business practice capabilities facilitated by Information Technology on performance of Supply Chain of Indian Automobile Industries.

C. Significance of Research

Key significance of paper is to access influence of three independent variables i.e. Inventory Management, Logistics Performance and Information Flow on dependent variable Supply Chain Performance (Cost Reduction and Strategic Gain) which leads to improve Supply Chain Performance of Indian Automobile Industries.

Indian Automobile Industries is major contributor of economy of India as well as world to some extent. Indian Automobile Industries are facing day by day challenges from International market specially from US and European automobile competitors entering in Indian market. Domestic manufacturer are facing genuine and severe competition from global players. International automotive companies manufacturing in India and domestic automotive companies together will leads the global automotive market in future. Automobile companies required raw materials and components from various industries. Technology based Supply Chain Management practices can be adopted to get better operational efficiency in order to improve performance and profit. Research finding aims to point out role of E-business processes for improvement of Supply Chain performance to achieve success in business to gain competitive advantage to build better strategic position in global market. This study provides direction to the automobile companies that how they can gain competitive advantages and gain more profit by implementing E-Business processes by better use of information technology tools.

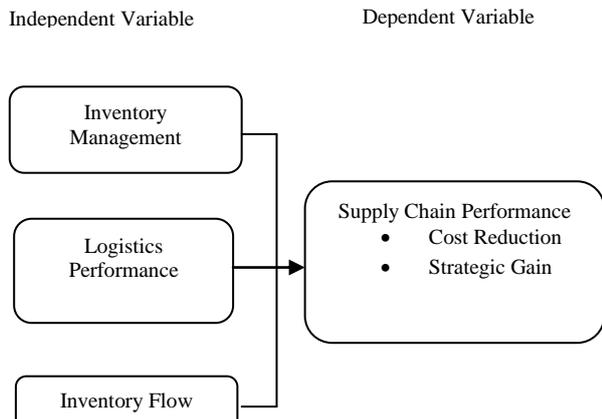
D. Sc Management in Indian

i. Automobile Industries

Concept of Supply chain begins around at the end of nineteenth century. In that era manufacturing requires very high skilled workers. Production time is very high during this period. Since an automobile vehicle is equipped with lot of components therefore variety of suppliers supplies components to Automobile companies. Due to lake of communication and other related technology there was lack of coordination among them. Due to this few vehicles was produced and they are very expensive and affordable by very few peoples. The problem with this system was that few cars could be produced by any one automaker, and vehicles tended to be quite expensive [Womack, J.P., Jones]. Automobile companies are largest manufacturer globally [Encyclopedia of American History]. In the middle of ninetieth century, around 6% of growth rate contributed by Auto Sector which was very high for that time. But there is decline recorded approximately by one percent after 1970. This decline continues till 2002 [G.P. Maxton & J. Wormald]. Supply chain practices of today's era are equipped with modern technology. Due to advancement in technology forecasting results are more correct in future. Due to this companies can manage inventories, production schedule in advance. This will provide new direction to supply chain and logistics [J. Miemezyk & M. Holweg].

E. Conceptual Frame Work

Figure 1 represents the model of the research which indicates that dependent variable Supply Chain Performance (Cost Reduction and Strategic Gain) influenced by three independent variables i.e. Inventory Management, Logistics Performance and Information Flow.



In Indian market youth is major market driven segment. Therefore design as per youth demand is necessary for almost all automobile companies to enhance their sales and to achieve business objectives. Therefore variety of features is required in a luxury vehicle to attract customers. These features make supply chain more complex because these features required more materials and components. Therefore more easy and user-friendly solutions are required in management of supply chain. Information Technology enabled E-business process is therefore a tool for better management of supply chain.

F. Procedural Definitions

ii. E-BUSINESS PROCESSES:

IT plays an key part in accomplishment of SC integration. IT largely comprise of “Email, Fax, EDI, Internet, Web applications, Mobile applications, Chats, GPS systems, RFID systems, ERP systems etc”. In the Automobile industries SC begins from the extraction of raw materials to the assembly the product then to final delivery to end users “(Tang and Qian, 2007). "E – Business" is characterized logical writing however there isn't worded meaning of "E-Business" quality. In the interim, "E – Business" ideas can be discovered many.

iii. Supply Chain Performance:

In SC there is flow of man, material, money & information. Efficient production planning and control is important part of Supply Chain performance measurement and decision making (Chan et al., 2003). E-Business Process is important for increasing efficiency of production planning and control. A Systematic approach is required to understand SC performance measurement (Chan et al., 2006).

G. Hypotheses

The Research hypothesis is formulated on the basis of theoretical frame work and previous studies as follows:

H1: There is statistically significant influence of E-Business Processes (Inventory Management, Logistics Performance and Information Flow) on Supply Chain Performance (Cost Reduction and Strategic Gain) of Indian Automobile Industries.

H1.1: There is statistically significant influence of the E-Business Processes in Inventory Management in Supply Chain Management of Indian Automobile Industries.

H1.2: There is statistically significant influence of the E-Business Processes in Logistics Performance in Supply Chain Management of Indian Automobile Industries.

H1.3: There is statistically significant influence of the E-Business Processes in Information Flow in Supply Chain Management of Indian Automobile Industries.

H2: There is statistically significant influence of the E-Business Processes (Inventory Management, Logistics Performance and Communication) in SC performance (Cost Reduction and Strategic Gain) in the Automobile Industries of India.

II. REVIEW OF LITERATURE

Simchi-Levi et Al. (2000, p.1) define SC management (SCM) is systematic procedure utilized to efficiently amalgamate all entities of SC to produce and distribute products with right quantities, to the right locations, and at the right time in order to minimize cost”. Lambert et al. (1998, p.1) spread out the SC Management definition to include perception of value creation by explaining SC Management as “the amalgamation of business processes from end user through original suppliers that provides products, services, and information and hence add value for customers and other stakeholders”. Due to advancement in technology in business there is huge competition globally. Adoption of E-Business Processes has become necessary for all organizations to compete in current market scenario globally. In order to reduce inventory level accurate visibility of demand is necessary (Sweeney, 2007). Expertise of Information Technology implementation to facilitate flow of operational process, information flow management, decision making support can be measure to evaluate how Information Technology will affect logistics performance (Choy et al, 2013). The SC management deals with the flow of products and information between the SC members. In present scenario most of the organizations dependent on E-Businesses processes tools in order to increase their business performance. Information flow, Inventory Management, Logistics are broad areas of Supply Chain which requires extensive use of Information Technology tools. Since today’s business are dependent on E-Business in order to improve service delivery. So they have to incorporate into their strategic plan (Kodama, 2013). Supply chain encompasses actions starting from extraction of raw material to conversion of final product till delivery to end user, relates to flow of material and information (Effy & Jones, 2008). Supply chain management ensures long term benefits to all entities of supply chain through information sharing and strategic gain through changeability in ordering (Yu et al, 2001). Information technology tools changes ways of doing business undoubtedly. This will create new business opportunity and ways to compete globally. Adoption of E-Business Processes created new dimensions in SCM. Adoption of new information technologies and day by day increasing competition companies requires have to restructure the way of doing work. In order to stay alive in comparative market rethinking, rebuilding of processes need to be required in management of Supply Chain (Drucker, 1998). A Systematic logistics system is necessary for acceleration of industrial development. Indian Automobile companies are producing wide variety of vehicles.

In an automobile vehicle large number of components required and it is not possible for an automobile company to manufacture all components, so they buy components from suppliers. This will create a large supply chain for an automobile sector.

III. METHODOLOGY

A. Population And Sample:

The population of the research encompasses all Automobile Industries and their suppliers; a probability sample is used to collect the data from higher to lower level managers. Data is collected from 205 managers and HODs of targeted companies. Out of which total 121 responses received.

B. Measures

For measurement of construct we used five point Likert Scale. As per follows.

Likert Scale:

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

In order to test reliability Cronbach's Alpha is used.

C. Statistical Methods

In order to achieve objectives of the studies software package SPSS 22 is used to analyze survey data (questionnaires) statically. Research analyzed primary data using following descriptive and statistical methods.

1. Frequency, Mean and Standard Deviation is used for Descriptive Statistics.
2. Hypothesis is tested by one sample Multiple Regression and test.
3. In order to check consistency of responses of questionnaires data collected and to test reliability Cronbach's alpha coefficient is used.

D. Type of Research

Data's are collected from survey are converted in to numerical form in order to calculate statically. So research proposed a descriptive, quantitative and applied study and a conclusion is drawn.

IV. HYPOTHESES TEST

A. Main Hypothesis

H1.1: There is statistically significant influence for the E-Business Processes on Inventory Management for Supply Chain Management of Indian Automobile Industries. (With a significance level equals or less than .05).

T-Calculated	T-Tabulated	Sig.	R	R ²	Results
12.231	197	0.05	0.392	0.153	Accepted

In order to test this hypothesis Multi Regression analysis was used. Table (2) as shown indicated that there is an influence of the E-Business Processes on Inventory Management for Supply Chain Management of Indian Automobile Industries. Due to significant results hypothesis is accepted. There is influence of E-Business Processes on Inventory Management for Supply Chain Management of Indian Automobile Industries.

H1.2: There is statistically significant influence of the E-Business Processes on Logistics Performance for Supply Chain Management of Indian Automobile Industries.

T-Calculated	T-Tabulated	Sig.	R	R ²	Results
9.652	3.56	0.004	0.463	0.214	Accepted

In order to test this hypothesis Multi Regression analysis was used. Table (2) indicates influence of E-Business Processes on Logistics Performance for Supply Chain Management of Indian Automobile Industries. This relation is significant upon ($\alpha=0.05$) therefore the null hypothesis is rejected. Therefore the alternative is accepted. There is influence of E-Business Processes on Logistics Performance for Supply Chain Management of Indian Automobile Industries.

H01.3: There is no statistically significant impact for the E-Business Processes on Information Flow for Supply Chain Management of Indian Automobile Industries.

T-Calculated	T-Tabulated	Sig.	R	R ²	Results
13.432	5.34	0	0.564	0.318	Accepted

In order to test this hypothesis Multi Regression analysis was used. Table (2) as shown indicated that there is an influence of the E-Business Processes on Information Flow for Supply Chain Management of Indian Automobile Industries. This relation significant upon ($\alpha=0.05$) therefore the null hypothesis is rejected, so alternative one is accepted. There is influence of E-Business Processes on Information Flow for SC Management of Indian Automobile Industries.

Test of the Main Hypothesis

H2: There is statistically significant influence of E-Business Processes (Inventory Management, Logistics Performance and Information Flow) on supply chain performance (Cost Reduction and Strategic Gain) for the Automobile Industries of India.

F-Calculated	F-Tabulated	Sig.	Results
13.432	5.34	0	Accepted

In order to test this hypothesis Two Way ANOVA is used. Table (4) show that there is significant influence of E-Business Processes on SC performance (Inventory, Logistics Performance and Information Flow) on Indian Automobile Industries. This impact is statistically significant upon ($\alpha=0.05$) so hypothesis is accepted.

V. RESULTS AND DISCUSSION

On the basis of analysis following conclusions are drawn:
 a. Sample population chosen for Indian Automobile industries to be aware of E-business Processes, and due this companies are gaining advantages in enhancing the performance of their Supply Chain.

Since Sample populations are using E-Business Processes therefore this obtained results indicate that sample supply chain influenced by technological advancement in E-Business processes.

b. There is a significant impact for the E-Business Processes on supply chain performance (Inventory Management, Logistics Performance and Information Flow) in the Indian Automobile Industries.

c. E-Business Processes are adopted by the sample's Industries in order to short out problems occurred in supply chain which will leads to increase in supply chain performance.

VI. CONCLUSION

This research concluded findings which show influence of E-Business processes on performance of Supply Chain.

a. To gain strategic advantages and to reduce cost of supply chain operations of Supply Chain must be carried out by E-business Processes and awareness of information technologies is very important.

b. All entities of supply chain are using E-Business processes to improve efficiency and performance.

c. By using E-Business Processes Inventory Management, Logistics Performance and Information Flow becomes better and it will leads to strategic gain and cost reduction of supply chain.

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