

Impact Of E-Business Processes And Information Technology Tools On Supply Chain Performance Of Indian Automobile Industries

Sumit Chandak, Neeraj Kumar

Abstract: E-Business Processes (EBP) acting as a key feature for enhancing the performance of Supply Chain (SC). In the past two decades due to advancement in IT tools and EBP tools industries has transformed their traditional SC to technology-driven SC. Due to this transformation rate of data exchange and communication amongst entities of SC has increased which leads to the overall improvement in the performance of SC. For effective SC proper coordination, communication and effective procedure are required amongst all entities and stack holders of SC. EBP and IT plays a key role in the effectiveness of this coordination, communication, and development of effective procedure and improves the operational performance of SC. Logistics is a key entity of SC. Without the improvement of logistics performance, no one can improve the performance of SC. Impact of logistics and operational performance on Supply Chain Performance is assessed in this paper. A questionnaire is prepared on the basis of these two attributes and data are collected from 186 SC and materials managers of the automobile and related ancillary companies. Data analyzed to validate the hypothesis and results are formulated to show the impact of EBP and IT on the performance of Supply Chain Management (SCM) in the context of Indian Automobile Industries.

Index Terms: E-Business Processes (EBP), Information Technology (IT), Supply Chain (SC), Supply Chain Management (SC), Supply Chain Performance (SCPR), Logistics Performance (LGPR) and Operational Performance (OPPR).

1. INTRODUCTION

Due to latest advancement in technology companies are in race to gain competitive advantage [1]. With the use of EBP and IT all the entities and stack holders of SC can connect and they can communicate effectively around the world. Entire workforce of company is connected through single network [2]. EBP and IT plays a vital role in the improvement of SC functions which starts from raw material supply to delivery of final product and according reverse SC. SCM plays a key role in entire business planning of a company [3]. With the help of EBP and IT tools companies can perform these planning's more efficient and effective manner. Customer satisfaction is important function of SC and technology plays an important role to increase value of customer. Due to increase in global competition every company is struggling to take sustainable advantage [4]. Thousands of parts are used in an automobile. It is not possible for a company to manufacture all components within a single company. Therefore various auto ancillary companies are supplying these parts to companies. In present competitive environment companies are taking help of technology in order to cut cost of operations, inventory, logistics, production, maintenance, rejections, salary, marketing, planning etc. Technologies build more visibility and control in various operations of SC. Today's market is customer driven market and due to globalization uncertain market and uncertain changes in technology, companies

are facing various issues [5]. In order to design vehicle as per international market automobile industries has to design their SC in more complex manner. These complexities create problems in SC like increase in lead time, unpredictable production schedule, increase in stock throughout SC and customer dissatisfaction etc. Use of EBP is necessary to deal with such complex SC in effective manner. EBP and IT tools creates new functional areas in SCM. Selection of appropriate technology as per situation leads to gain more competitive advantage [6]. Due to Use of EBP and IT tools communication becomes faster and efficient, interpretation will become more efficient to predict situation, identification become more faster and accurate, storage and retrieval of data becomes more reliable and accurate [6]. Implementation of EBP and IT tools results in reduction in the cost of SC. This technological advancement accelerates the processes with more accuracy. These tools added values in processes directly and indirectly [7]. In this paper a theoretical frame work is created on the basis of four independent variables affecting the performance and Sustainability of SC. Impact of these four independent variables on supply chain performance (as dependent variable) is assessed.

1.1 PROBLEM STATEMENT

Without IT tools success of any business is almost impossible now a days. As the time progresses demand of these tools will increase drastically. These tools will help in overall grooming of business. Conventional SC is become almost absolute at present. SC flexibility will increase due to use of EBP and IT tools. EBP and IT tool transformed almost all functions of SC and its management. EBP and IT tools added value in SCM. Due to use of advanced technological tools it is very easy to interpret and analyze data. This paper assessed impact of EBP and IT tools on performance of SC of Indian Automobile Industries. For assessing performance of SC operational performance and logistics performance are used as dependent variable on supply chain performance as independent variable.

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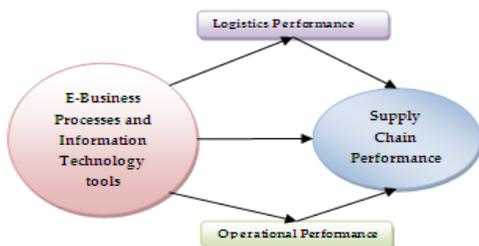
1.2 OBJECTIVE OF RESEARCH

Impact of EBP and IT tools on Performance of Indian Automobile Industries is assessed in this paper. Objective of this paper are as follows.

- Determining impact of Implementation of EBP and IT tools on operational performance of SC.
- Determining impact of Implementation of EBP and IT tools on logistics performance of SC.
- Determining impact of operational performance and logistics performance on performance of SC.

1.3 CONCEPTUAL FRAME WORK

Following Figure shows a conceptual framework that highlights supply chain performance influenced by logistics and operational performance.



1.3 HYPOTHESES

Research hypothesis is developed with reference to conceptual diagram shown in figure 1. The hypothesis are as follows

Hypothesis 1: "There is statistically significant impact of" EBP and IT tools on operational performance of "Indian Automobile Industries".

Hypothesis 2: "There is statistically significant impact of" EBP and IT tools on logistics performance of "Indian Automobile Industries".

Hypothesis 3: "There is statistically significant impact of" EBP and IT tools on operational performance and logistics performance on supply chain performance in context of "Indian Automobile Industries".

2 LITERATURE REVIEW

In enhancing performance of SC analysis of all tangible and intangible data plays an important role and with the help of technology data can be collected and analyzed more rapidly and effectively [8]. In today's global competitive world efficient network of information through the SC is must and optimization of SC in order to maintain sustainability is necessary. Use of technology becomes wider now a days and companies can store and interpret more and more data in very effective manner and can create value in SC [9]. According to Sarat Kumar Mishra et al. [10] "Supply Chain Management (SCM) is concerned with the flow of products and information among the members of the product units that make up all organizations, such as suppliers, producers, service providers and customers. These organizations

communicate to access, purchase, transfer, retrieve and distribute products as well as services, suppliers to the end users". All the processes relate to information and communication are processed by electronically now days. Companies are using IT tools to increase communication between all the entities of SC [12].

2.1 Role of E-Business processes and Information Technology on Supply Chain

Here EBP means doing all activities of SC electronically and by use of Information technology tools. With the use of IT SC manager can monitor all activities of SC very efficiently. Technology helps in SC agility. Implementation if IT in SC increases value of information sharing which finally increase operational performance of SC [13]. Due to implementation of IT tools in SCM long term relationship improved a lot and Management of Inventory becomes very efficient and cost effective [14].

2.1.1 Impact of E-Business processes and Information Technology on Logistics Performance

Implementation of Information Technology tools enhances logistics performance [15]. Logistics Service firms those having large turnover are prefer to spend more in IT tools to add more value in SC network globally [16]. Companies can improve their SC functions by implementation of IT tools in logistics functions. In order to enhance performance of logistics better coordination between logistics service provider is necessary. Information technology improves coordination amongst logistics service providers [17]. According to council of logistic management logistics is "that part of supply chain process that plans, implements, and controls the efficient, effective, forward and reverse flow and storage of goods, services, and related information between the point of origin and the point of consumption in order to meet customer requirement". There is quick implementation of IT tools for logistics functions are seen in last two decades. Almost all firms are using these tools for various logistics functions to improve performance of logistics.

2.1.2 Impact of E-Business processes and Information Technology on Operational Performance

Due to advancement in IT technologies firms competing in identical set of connections required SC incorporation to optimize their operational performance. Most of the firms are trying to integrate their SC [19]. Broad key SCM is "integration of three broad functions namely supplier relationship management (SRM), internal supply chain management (ISCM) and customer relationship management (CRM) with a view to managing the smooth flow of product, information and funds among the supply chain partners and delivering superior value to the end customers" [20]. EBP and IT improve SC performance by providing tools for SC integration and collaboration. "Business analytics may help in increasing organization efficiency, using different analytical methods to forecasting trends of market and reduce the operating cost and increase the profits by using mature supply chain systems" [21].

3 RESEARCH METHODOLOGY

In this paper a questionnaire is framed on the basis of attributes studied from literature and these attributes are discussed with experts. On the basis of discussion those attributes which are affecting performance of supply chain by implementing EBP and information technology tools for logistics and operational activities are selected. Questionnaire was sent to 663 SC and related managers out of which 102 responses are collected. Logistics performance and operational performance are taken as independent variable and SC performance as dependent variable for analysis. "Cronbach's alpha test" is used to validate questionnaire.

3.1 MEASURES

In order to evaluate construct "five point Likert Scale" is used

Strongly Agree	Dis agree	Neutral	Agree	Strongly Agree
1	2	3	4	5

3.2 STATISTICAL METHODS

"PLS-structural equation modeling" is used for analysis. To validate questionnaire "Cronbach's alpha is used. Table 3.1 shows that questionnaire is reliable.

Table 3.1 : Questionnaire Reliability Test

Items	Cronbach alpha
Logistics Performance	0.779
Operational Performance	0.851
Supply Chain performance	0.823

3.3 hypothesis Testing

In order to test impact of hidden variable are analysed using t-test. Table 3.2 represents t-value and significance level "from the bootstrap test". From these it is clear that all hypotheses are valid.

Table3.2 : Significance level 0.05 (2-tailed test)

Hypothesis	Path Coefficient (β)	t-value	results
Hypothesis 1: "There is statistically significant impact of EBP and IT tools on operational performance of "Indian Automobile Industries".	0.211	2.899	Accepted
Hypothesis 2: "There is statistically significant impact of EBP and IT tools on logistics performance of "Indian Automobile Industries".	0.34	3.426	Accepted
Hypothesis 3: "There is statistically significant impact of EBP and IT tools on	0.29	3.312	Accepted

operational performance and logistics performance on supply chain performance in context of "Indian Automobile Industries".			
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4 CONCLUSION

Proposed framework is developed by extensive literature survey. Current and future scenario in equipped with technology and every business activity will require help of EBP and IT tools for more and more better performance. Supply Chain is one the major activity amongst these business activities. There are lots of activities required for management of SC. SC is network of variety of activities. In this paper we have taken two major activities i.e. logistics performance and operational performance to show impact of EBP and IT tools of performance of SC. Results shows that there is significant impact of logistics performance and operational performance of performance of SC. This paper is limited to only these two variables there is a scope to analyze other variable to which has significant impact on performance of SC by implementing EBP and IT tools in context of Indian Automobile Industries.

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