

# E-Commerce Integration with Value Chain to Grip Competitive Advantage in the era of International Business

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## Abstract

By dint of deconstruction of value chain through e-commerce, organization has moved from centralized, vertically integrated, single manufacturing facilities to geographically discrete web of resources that reciprocally generate ultimate “Value” for the global customers. The foundation basis of e-commerce is accurate and real time information flow which used to absent in the traditional linear sequenced value chain process. This paper discuss the information distortion in the linear sequenced traditional value chain and explain the gap that implies the necessity of real time information across the supply chain partners spreading across the world to meet up diversified consumer need. Also the paper examines the role of information technology in the form of e-commerce is vital to integrate with value chains to ensure just in time logistics delivery at the operation floor accumulated from different parts of world and deliver right through the channel to end customer by ensuring efficient warehouse management.

**Keywords:** Value chain, e-commerce, JIT, customer demand, out sourcing, e-business strategy, supply chain, information integration

## 1. Introduction

“According to CEO of Siemens Heinrich Von Pierer “Between 60 to 80 percent of the value added we generate is linked directly to knowledge- and that proportionate is elevating”.

In the era of highly competitive business arena, the factual rivalry is not company against company but rather supply chain against supply chain (Christopher 1992). The statement identifies the competitiveness of supply chain coordination and collaboration is required to fulfill the demand of consumer satisfaction in this globalized era where company set it’s headquarter in one country and operation in another country. The traditional design of value chain management is failed to create ultimate value for the consumer due to demand information distortion (Jones and Twill 1997) and timely material management to manage warehouse management (Claycomb *et al.* 1999) while demand and material flow are firmly interlinked. Therefore, in 21<sup>st</sup> Century, the aptitudes of conveying knowledge across department, stakeholders, company and global frontier have been considered the vital competitive advantages of any firms (Phan 2003). Meaningful information (knowledge) has glued all the activities of value chain together (Boston Consulting Group 1998-1999). Information is the basis of brand loyalty, customer relationship and supplier relationship (Boston Consulting Group 1998-1999). With the growing implementation of automated information system in this era, market becomes more sophisticated. Global consumers are increasingly shifting their demand from conventional product quality and price to diversified product line with prompt action of delivery. For that reason, over the past few decades, a combination of technology, economy and market forces have compelled organization to reexamine their value chain strategies. The integration of e-commerce and supply chain assures more timely and precise information sharing among the backward and forward steps of value chain process. The precise flow of consequential information through the wearing of e-commerce contributes positively to achieve greater coordination and collaboration among the supply chain partners to avoid “bullwhip effect” that used to be challenging and considered most tough job in traditional value chain.

In this paper, published articles and related books on information management, JIT, e-fulfillment, deconstruction of value chain, e-commerce and supply chain integration have been reviewed carefully to rationalize the facts in the perspective of international business - why does automated information management in the wearing of e-commerce is vital to integrate with value chain to gain competitive advantage while contemporary companies are more externalizing their manufacturing activities. The objective has been set in two stages to explain the answers. First the objective has been set to find out how information and communication technology in the wearing of e-commerce mitigates the gap in the traditional value chain process and how it contributes to combine the contemporary spreading value chain management to serve diversified consumer need effectively. The second objective of the paper aims to find out Just in Time delivery of inbound logistics in the wearing of information technology is the critical and vital for effective ware house management and thus becomes the principal backbone for serving customer needs.

## 2. Literature Review

### 2.1 Value Chain and E-Commerce Strategy

According to Porter and Miller (1985), “The Value chain process is authentic guide and tool for indentifying different ways of creating of customer value”. In the value chain process supply chain process is the most important part that mange the different independent processes such as customer relationship management (CRM), customer service and effective and efficient management of demand, order, production, material flow and purchasing (Lumsden and Mirzabeiki 2008). In this regard IT in the wearing of e-commerce can be classified into e-commerce, e-procurement and e-manufacturing. Here e-commerce refers, support offered for sales, distribution and customer service process (Brynjolfsson and Smith 2000); e- procurement refers assistance in procurement, tendering and order fulfillment process (De Boer *et al.* 2002) and e-manufacturing gives support to demand and capacity planning, forecasting and integration of internal supply chain (Kehoe and Boughton 2001). A coherent e-commerce strategy refers to adopt the right choice of tolls and solutions undertaking the concern of organizational strategy and goals (Soliman and Youssef 2001) and this coherence of choices ensure the integration with the other organization’s management tools to improve the overall business process(Graham and Hardkar 2000).

### 2.2 Necessity of Information Integrated Supply Chain in Globalized Business

One of the well-known approaches of information integration is information HUB (figure 1) based on a central club that connects all channel partners through internet. This is mainly a node in the data web where multiple stakeholders can act together in pursuit of supply chain integration (Lee and Whang 2001). Value chain management is worthless if the timely and accurate sharing of information is absent in different parts of the supply chain management; and IT, though is supportive activity, acts as linkage for independent value chain activities to be integrated (Porter and Miller 1985; Bergeron *et al.* 1991). IT is in the form of e-commerce supports supply chain integration by managing efficient of information transfer, on time accessibility of information and intelligibility of the relevant business information. E-commerce is especially important for supply chain as a consequence of the growing need to coordinates and optimizes the activity both in intra and inter-organization level (Stevens 1989). Information integration is the foundation character of the value chain management due to its globalization approach because now companies manufacture product in one country, assemble in another country and distribute globally (Hakansson and Snehota 1995). Therefore, for effective coordination and fulfillment process companies must have access to timely and accurate information flow reflecting the status of their supply chain process within the organization and also with other organizations (Clark 1993).

### 2.3 Automated Information Management to Avoid ‘Bullwhip Effect’

“Bullwhip effect” one of the major challenge in the supply chain process pertaining to inbound and outbound logistics process. The bullwhip effects indicates the disequilibrium in the inventories of the supply chain management especially higher upstream than downstream and it is caused by inadequate information sharing among the stakeholders, deficient market demand data and insufficient forecast and other market drivers(Germain *et al.* 1994). Due to inefficiency of information flow among partners in the supply chain, Bullwhip effect was the major problem in linear sequenced supply chain process (Jones and Towill 1997). One of the vital strategies used for this is transparency of information. Particularly, with the information distribution through the automation, manufactures can view the inventory level of the retailer across the world to coordinate the process including frequency, quantity and timing of the shipment. This leads to proper inventory management by the manufacturer and enables to plan the shipment process more efficiently (Clark 2000).

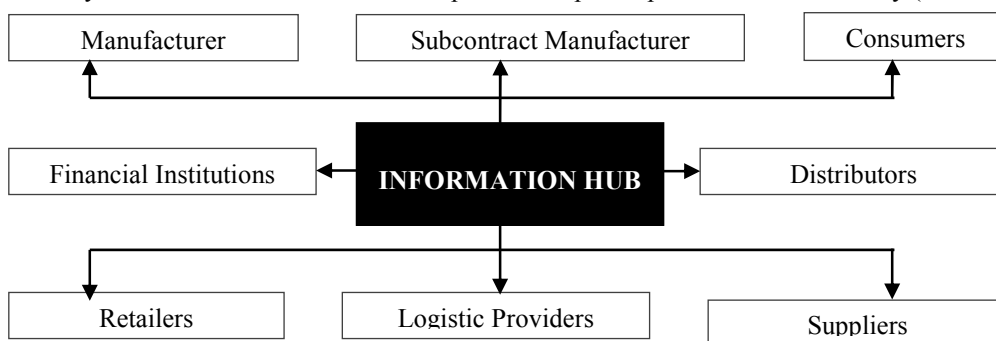


Figure 1. Information Hub; Source: Lee and Whang 2001

### 3.0 Analysis

#### 3.1 Problem Analysis of Linear Sequenced Traditional Value Chain

Describing the problem of traditional value chain Stalk and Hout (1990) specified that when information ages, it loses its value. The problem with old data is that it causes amplification delay and increase overhead, therefore, overall cost elevates and company loses its competitive advantage. The way out is to compress the information time so that information remains fresh and meaningful in the overall supply chain process. The world trade setting has changed. In the deconstructed value chain process contemporary organizations have been rapidly outsourcing their activities to some specialized and efficient providers with the intention to enhance the efficiency and keep down the overall cost, thus create the competitive advantage. Therefore, to collaborate and coordinate the activities, information integration is a must within the suppliers across the world (Hakansson and Snehota 1995). In this changing scenario, the traditional supply chain was concentrated in a country and was not that much decentralized.

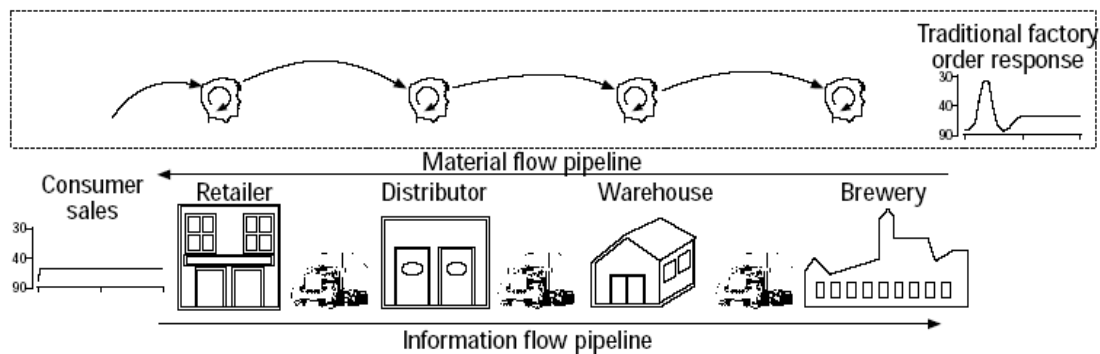


Figure 2. One directional informational flow in the traditional value chain; Source: Jones and Towill 1997

The retailer is the only player who has got the information of consumer demand, therefore, all the members have got the information from its immediate supply chain partner (Jones and Towill 1997). As a result, information distortion initiated with the retailer and it continued throughout the process. The demand data transmitted along a series of inventories using stock controlling order which led to a demand variation in every echelon (Burbidge 1989). As a result of information distortion, every echelon holds a large number of stock holding. Deficient in serving customer demand and on-time logistic flow, obsolete product write-off and high cost bearing are the consequence of traditional value chain management that creates the well-known "Bullwhip effect".

#### 3.2 Enriched Information Management and Communication Technology to Mitigate the Gap

Enrich information and communication technology, in contemporary business supply chain management has proven its blessing stroke. With the growing electronic data exchange process specifically called electronic point of sale (EPOS), the upstream supply chain partner has got the real-time access in the regardless of the distance in which country they are operating. Therefore, enriched information distribution allows the upstream player to overview the stock levels and judge how much to produce to cover up current customer demand. The process also allows the upstream player to effectively manage their material to produce the right product at the right time rather than "Hunch" judgment for forecast. Therefore, the material-keeping cost also kept low and the frequency of product obsolescence has been triggered down to a minimal (Simchi-Levi *et al.* 2002; Jones and Towill 1997).

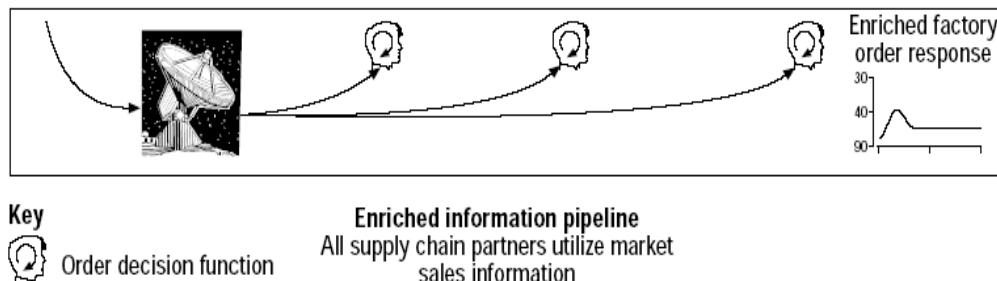


Figure-3: Real Time information flow in information enriched supply chain; Source: Jones and Towill 1997

Among vast number of examples, Wal-Mart's EPOS system with its supplier is a revolutionary example. Based upon the trustworthy relationship, Wal-Mart broke the barriers of sharing consumer relationship with its supplier Procter and Gamble for having better consumer service (Johansson *et al.* 1993). Both of the companies have benefitted by the EPOS system and shared consumer information system. Procter and Gamble now taking the information through EPOS to determine how much and how frequently the stock should be delivered to the

Wall-Mart stores to satisfy the current consumer need. As a result, Wal-Mart has also become to eliminate the buffer stock at different individual point and thus curtail inventory keeping cost and make their offer more competitive. Procter and Gamble has far better control on their factory and inventory through forecasting what is going in the market based on the real data. Now, both the organizations, in this aspect, have been enjoying a flexible supply chain through the information and communication management.

### *3.3 JIT to Manage Inbound and Outbound Logistics- the 'Basis' to Offer Competitive Advantage*

“The enriched information management system has unlocked the unparalleled opportunities for both business and consumer but it depends on how companies exploit e-business opportunities to efficiently manage their logistics (Lumsden, K. and Mirzabeiki 2008)”

If the critical eye is put on the traditional value chain management then it can be sorted out, due to information distortion, the traditional management faced challenge to forecast the right consumer demand as required so they failed to efficiently manage the logistics and consequently carry large stock, produce unneeded capacity and pushed up the per unit cost. Therefore in this regard, JIT is the accurate technique to enhance the overall logistics management to efficiently manage the logistics to fulfill the consumer need. The world trade setting has changed. Now Global consumers have shifted their demand from conventional product quality and price to diversified product line with prompt action of delivery. To meet up this consumer demand manufacturers must forecast the right demand with prompt market delivery (Kane and Fawcett 1993). Eloranta (1988) suggest that the main intent of production management should be met up the delivery time promised and performance towards better customer service. He also suggests that increasing inventory levels or deficiency to release the inventory is the main hindrance to meet consumer demand. To fulfill the changed consumer demand, organization has frequently outsourcing their materials and sometimes place their production plant where they can have direct access to cheap raw materials which is characterized “inbound logistics” in value chain. Therefore, either from various 3PL sources across the world or from their own sources they collect the inbound logistics, take it to the assembly plant and produce it and serve it to the global consumer. The complete attempt is to meet consumer demand at competitive cost and less time. In the every process JIT is involved especially with inbound logistics to transfer it to outbound logistics to customer. JIT has first invented by the Japanese manufacturer and become successful enough to improve the overall production process.

### *3.4 Real-Time Information Flow is a Prerequisite to Apply JIT Management Practice*

“Enriched information technology permits the timely and accurate customer and market information flow upstream and reversely allows inventory and product availability information flow downstream (A Alderson and lee 1999)”

To ensure real time information flow, information technology in various form of e-commerce including electronic data transfer, EPOS, bar code, CAD, internet and World Wide Web is used to setup the effective JIT process in the industry. IT allows the real time information flow across the system, gather right demand information of the consumer, setup a communication link in between the customer and suppliers to define product specifications, building we system that allows the supplier to delivery on time due to meet any unexpected demand and also aware the suppliers in the network for any changes has bought in the system. The real time information allows the manufacturer the view the inventory level and thus determines the quantity to deliver on time to transform outbound logistics.

### *3.5 Case Study: Logistics Management of the Automobile Industry*

The Supply chain management especially logistics management of automobile industry has been considered most challenging and complex work to transform inbound to final product. The average vehicles consist of 2000-5000 components simultaneously (Holweg and Miemczyk 2004). The challenging job is the availability of the stuffs while making assembling for the final products. Therefore, the company has to maintain a tight and demand basis warehouse management to assure on time supply of materials at the operation floor. This job has been receiving extra challenge due to deconstructed value chain management. The suppliers of the industry is not concentrated in the same country, thus logistics management has to be managed from different parts of the world while on time component requirement is the foundation to produce a vehicle. Therefore, in the following example (figure-4), the logistics management of automobile industry will be illustrated.

The supply chain management of automobile industry is going through some major transition period. Previously, the industry used to follow the “push” inventory policy to produce the final product which gave rise of holding expensive inventory at different points of supply chain management (Fisher 1997). Therefore, the organizations had to count a big money due to this unexpected costly holding of inventory. It was estimated, across Europe US \$ 9 billion could be saved through the reduction of finished vehicle tocks (ICDP, 2000) and also in US an estimated of US\$ 1500 per vehicle could be saved through adopting BTO (build to order) strategy (ICDP, 2000). The Car manufacturer used to rely on forecast policy for producing the vehicle rather than considering the actual demand of consumer.

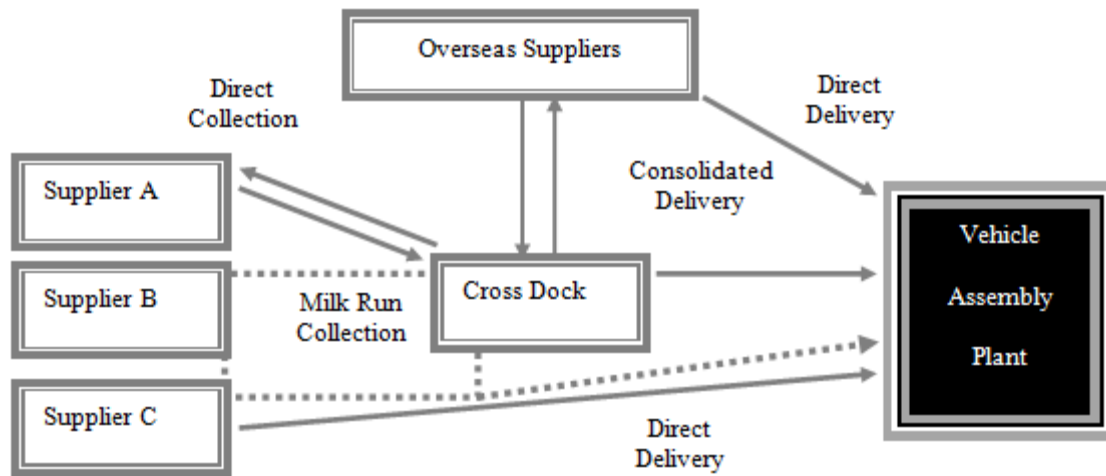


Figure-4: Delivery of Automobile Inbound logistics across the world to the final assembly plant;  
 Source: Holweg and Miemczyk 2004

On the other hand building vehicle to order against of forecasting policy is definite logic to manage the total system effectively and efficiently. Therefore, the transformation of supply chain initiated with the growing acceptance BTO policy (Holweg and Miemczyk 2004). Build to order is the guiding object to ‘pull’ the necessary production components at the assemble floor according to the pulled demand by the consumer and the basis of the theory adopted from the lean philosophy of the Toyota production system (Holweg and Miemczyk 2004). The main focus to adopt the policy is to save significant waste due to over production. The key obstacle determined by the organizations to adopt the policy is inability to assemble necessary vehicle materials on time to deliver customized vehicles while suppliers are not geographically concentrated in the same country (Holweg and Miemczyk 2004). However, they determine inbound logistics as the key enabler of supply chain link and secondly right time accumulation of inbound logistics is foundation to deliver customized offer. Therefore, JIT application in the form of JIT technology is profoundly emphasized to adopt the policy to reduce the high lead time. They put emphasize on frequently needed materials and frequency of delivery in a system which is only achievable through the effective use of JIT technology. Considering the geographical distant setup of supplier, the organizations set the strategies to implement JIT technology to enhance volume mix, changeover flexibility and modification (Claycomb *et al.* 1999). Based on the effective use of JIT technology and inbound logistics, organizations set their new delivery time to the customer which used to be 6 weeks to 10 weeks previously:

Vehicle Manufacturer	Program Name	Delivery target	Previous delivery date
BMW	COSP	10 days	6 to 10 weeks
Daimler Chrysler	Global ordering	15 days	6 to 10 weeks
Ford	Order to delivery	15 days	6 to 10 weeks
General Motors	Order to delivery	20 days	6 to 10 weeks
Renault	PND	14 to 21 days	6 to 10 weeks
Nissan	SCOPE, ANS & ICON	13 days	6 to 10 weeks
Toyota	-	14 days	6 to 10 weeks
Volkswagen	Consumer to consumer	14 days	6 to 10 weeks
Volvo	Distribution 90	14 days	6 to 10 weeks

Table-1: Reduced delivery target based on IT and JIT practice of automobile industry  
 Source: Holweg and Miemczyk 2004

#### 4. Findings

From the above analysis and discussion the findings can be outlined as follows:

1. The linear sequence of activity in the traditional value is deficient in perspective of international business due to lack in demand fulfillment and deliver the product on right time to the global consumer. The linear one way information flow is the principle cause behind the shortfall which creates the information distortion at every step of value chain process.

2. In international business, the deconstructed value chain is spreading all across the world due to find direct access to raw materials to offer competitive product. Therefore, in this deconstructed mood, right flow of information and communication is necessary to forecast customer need to efficiently transfer inbound logistics to outbound logistics. To do that on time accumulation of logistics, operation, and warehouse management are prerequisite to meet global consumer demand. Linear sequence of activities in the traditional value chain is insufficient in this regard due to lack in delivering accurate and precise information.
3. The combination of enriched and information and communication technology on the wearing of e-commerce is effective and efficient medium to give access all the supply chain partners to view and perceive the real market demand. This helps to aggregate the whole supply chain process down and up the order.
4. The JIT is an effective and efficient management practice to transform the inbound logistics to outbound logistics and serve it to the customer on time. The process worked as a main coordination and collaboration point in upstream of the supply chain process.
5. The integration of JIT and e-commerce is today's deconstructed value chain process to serve the customer need though the accumulation of inbound logistics from diverse parts of the world.
6. Along the accurate and precise information flow, it is obligatory to build a relationship of trust among the suppliers in upper stream. Without trust, it is quite tough to coordinate the information flow with the use of information technology. In the Example of Wal-Mart, it can be seen that Wal-Mart has shared its consumer data with Procter and Gamble based on the trustworthy relationship and made a momentous coordination through their e-business strategy. Procter and Gamble can unlock the secrecy of data to Wal-Mart's competitor but the Wal-Mart believes their suppliers and suppliers keep the faith and thus create the noteworthy supply chain collaboration through their e-business strategy.

Therefore, the core finding is the combination of information technology in the form e-commerce with value chain is vital to serve contemporary consumer needs by effectively and efficiently managing inbound and outbound logistics across the world.

## 5. Conclusion

In this globalized era, the international business phenomena is to conduct business from where it gets maximum benefit in the form of cheap labor force and cheap raw material to offer diverse product line at competitive price. The massive use of information technology allows the global manager to sit in one country and control business from other country. The intent of all the set up is to meet the diverse customer demand through value creating activities across the world. In this regard, information flow has to be accurate, enriched and on time among the different business units to aggregate -what quantity to serve and how to serve to meet the global customer demand. The traditional value chain remained unsuccessful in this area due to insufficient one directional information flow among the supply chain partners starts from retailers. Due to information distortion, vast inventory holding has become the regular business phenomena and thus suffering through bearing the extra cost for extra inventory holding. To meet up the gap, simultaneous real time information flow has become the basic need for the supply chain partners which is only achievable through the integration of information technology in the form of e-commerce in the value chain process. E-commerce in the form of e-fulfillment process allow the partners to utilize the market demand data simultaneously regardless the distance and facilitates to improve the overall speed of the response and thus reduce the demand amplification trend which was a main drawback of traditional value chain. Based on the real time demand data, suppliers in the different parts of the world response for just in time logistics delivery to different assembly point thus reduce the setup time for a unit and transferred to the warehouse for effective outbound distribution and consequently manage the warehouse effectively. The overall effect is accurate product flow to fulfill accurate demand with prompt delivery at competitive price along with diverse product lines.

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