Levels and Barriers to Supply Chain Integration: 
A conceptual model of Supply Chain Performance

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Abstract: In modern business scenario Supply chain has become the back bone for every business organization. All supply chain partners are joined together in value delivery network of company that no one can perform better without support of other. The ultimate objective of this cohesive relationship is to deliver value to customers and gets desired state of customer satisfaction and loyalty for the organization. For this purpose it is necessary to integrate the internal and external partners of Supply chain at different levels. The Purpose of the paper is to investigate the impact of supply chain integration on supply chain performance. The construct of Supply chain integration has been divided into three derivers that are information integration, coordination resource sharing and organizational relationship linkage. There are certain barriers to integration found in each industry that have moderating effects on the relationship b/w integration and organization performance.

Key words: Supply Chain , Integration, Performance , Barriers to Integration

1. Introduction to supply chain integration

Integration is now widely taken the central concept of successful supply chain management (SCM), because the implementation of SCM needs the integration of processes from sourcing, to manufacturing, and to distribution across the supply chain (Cooper et al., 1997; Ellram and Cooper, 1990; Mentzer et al., 2001). The scope of supply chain integration is not limited but it has wide scope ranging from supplier integration to customer integration covering central concept of internal integration also (Flynn et al., 2010; Zhao et al., 2010). Supply chain management focuses on integration, cooperation and coordination throughout the value chain” (Stank, Keller, and Daugherty 2001). The supply chain integration work on principles of collaboration, shared decision making, open communication, shared vision, shared technology and high level of trust between the producer and their customers (Flynn et al., 2010). The objective of SCI is to achieve accurate, timely and smooth flow of goods and services, information, money and processes, to impart maximum value to the customer at low cost and minimum time in an efficient manner (Bowersox et al., 1999; Frohlich and Westbrook, 2001; Naylor et al., 1999). According to Christopher (1994), a supply chain is a network of institutions that have strong bonds from upstream to downstream in all processes and activities in such a cohesive manner that make a value for organization and for end customer.

2. Resource based view (RBV) and relational view (RV) approach

The positive relationship b/w SCM and performance found in literature takes its philosophical roots from RBV approach and its extensions. Initial RBV approach says that internal resources of firm are rare, inimitable,
having no substitute and are source of competitive advantage for firm. (Barney, 1991; Dierickx and Cool, 1989; Peteraf, 1993). Dyer and Singh, (1998) presented Relational View (RV), integrating transaction cost theory (Williamson, 1985, 1996) and its critics (Zajac and Olsen, 1993); as per (RV) theory relationships are the main source of higher performance and lowering cost for firm which is essence of Supply chain integration; integration with the internal and external supply chain partners on multiple levels.

3. Supply chain integration in literature

It is the degree to which a manufacturer strategically collaborates with its supply chain partners in order to achieve effective and efficient flows of products and services to provide maximum value to the customer. The objective of supply chain integration is to make effectiveness and accuracy in overall operations of company and streamline product, information and cash flow from suppliers to end consumer (Sammuel and Kashif, 2013).

Alfalla-Luque et al., (2012) Stated that supply chain integration has three levels or facilitators;
1. Information integration
2. Coordination and resource sharing
3. Organizational relationship linkage

4. Information integration

Information integration is strategic component of supply chain integration for smooth operations in every business organization (Cooper et al., 1997). Kaipia (2007) in doctoral work on Supply chain coordination, author emphasized strongly on importance of information sharing in better SC coordination Raja guru and Matanda (2013) worked on effects of inter organizational compatibility on supply chain capabilities while taking mediating effect of inter organization information system integration. They emphasized the importance of integration of information system among SC partners in terms of lowering inventory cost and minimizing risk of barriers to better performance. IT has tremendous impacts on Supply chain agility of the firm in terms of better responding to market fluctuations through timely, adequate and accurate flow of needed information among supply chain partners which in turn makes positive impacts on the firm's sales, market share, profitability, execution of coordinated plans, and customer satisfaction (DeGroote & Marx, 2013). (Soderoa, Rabinovich, & Sinha, 2013) in research on drivers and outcomes of high technology supply chain which works on internet based inter and intra organizational systems find that these technologies make organization capable to improve business process because of timely, accurate and needed information for shared decision making.

5. Coordination and resource sharing

According to Mangan et al., (2008) “Supply chain integration is the alignment and interlinking of business processes, collaboration is a relationship between supply chain partners developed over a period of time”. Supply chain integration comprises a set of firm’s activities tailored to fostering its relationships with suppliers and customers; these are designed to harmonize supply chain activities with suppliers on the upstream side and enhance customer satisfaction on the downstream side through offering superior products (Petrovic-Lazarevic et al., 2007). The supply chain integration is a building block comprised of bricks of joint collaboration, high level of coordination, shared vision, shared information and technical infrastructure between manufacturer and distributors (Flynna et al., 2010). From research on buyer and seller collaborative relationship in dairy sectors, it was concluded that efficient logistics system and adoption of process technologies and information sharing are the means of milk supply chain competitiveness. (Moori, Lima and Menezes, 2012).

Mason and Lalwani (2007) worked on improved transport integration in supply chain system in UK; we can fit it in our model of logistics design integration with external partners (distributors and suppliers). Manufacturing is becoming very much transport intensive now a days and reducing cost and raising quality is
hallmark of success for every business, so, different tools are there for integrating transport into supply chain system based on their cost and benefit analysis but all they need is close collaboration between customers and suppliers in our model. Sawik (2013) made research on complex decisions involved in supply chain in presence of barrier of disruption risks. Integrated decisions of selection of suppliers and scheduling customer orders are matter of close coordination in natural incidents or disruption risks. This will ultimately improve the performance in scenario of disruption risks. Mazlan and Ali(2006) worked on finding relationship between supply chain management and outsourcing says that a company should outsource supplies or those function to other parties who have expertise in it but ultimately it will lead to better SCI as company will focus more on core business activities. Junqueria (2010) in his thesis on logistics and SCM gave governance theory for better SCM it was discussed that SCM practices have significant impact on integration of dairy farmer supplier with company and it build high level of mutual trust and collaboration between the dairy farmers and organization. Research presented in international farm management congress gave insights into environmental aspects of SCI in milk sector of Australia, it was stated that milk processors are re aligning themselves in supply chain with their internal and external partners because of HSE concerns and deregulation policies in developed countries like Australia (Issar, Cowan and Wegener, 2003).

6. Organizational relationship linkage
Childerhouse and Towill (2011) in Arcs of supply chain integration declare that SCI is initiated from the roots of internal cohesiveness and pass through upstream and downstream external integration. Flynn, Huo and zhao (2010) made a comprehensive research on supply chain integration in chinese manufacturing sector and devised model based on internal and external integration. Internal integration is up to what extent departments and functions within an organization are working in close integration while external organization leads towards close strategic relationships with customers and suppliers. Supply chain strategy need to be incorporated into all levels of corporate strategy for achieving business excellence (Harrison and New, 2002). Van Hoek (1998) investigated the factor of internal integration and external integration in context of the research work on supply chain integration. It was evident that internal integration among all functional areas is one big milestone towards achieving the stage of SCI and then getting rewards of it in terms of increased organizational performance. Fast Communication channels among the members of supply chain help in framing business policies, goal alignment and achievement of tasks timely (Ross, 2011). Chan et al., (2012) worked on SCI and performance measurement; a deeper understanding and continuous improvement in internal and external business processes is mandatory for achieving business objectives as well as reaching the desired stage of customer satisfaction. In era of globalization supply chain relationships and procedures must be alligned and integrated with business strategy so that the ultimate purpose of customer satisfaction and value addition to company value delivery network should be materialized. Three major forms of SCI integration were investigated which are intra organizational process integration, inter organizational collaboration and Operational excellence. First form relates to strong level of coordination among different functional departments of the organization and its processes, if first form is there it makes possible to integrate the SC functions of organization with suppliers and customers and finally operational excellence make the organization stand at competitive position in terms of cost and service effectiveness (Morash and Clinton, 1998).
7. Supply chain performance

Research done on Supply chain practices and their impact on customer satisfaction in pharmaceutical industry in developing countries it was observed that SC practices comprise of three pillars namely collaboration and information sharing, logistics design and IT infrastructure, and organizational culture (OC); all these impact significantly on customer satisfaction (Haque and Islam, 2013). Supply chain partners join hands together in long-term objectives and combine resources (assets, knowledge and capabilities) to deliver competitive advantage and superior performance (Cadden et al., 2012).

Luque, Lopez and Dey (2012) worked on supply chain integration framework using literature review and declared that information integration, coordination and resource sharing and organizational relationship linkage are three main pillars for SCI. It is not only a process or technique but it need to be inculcated in organizational culture. So, organizations need to nurture healthy culture of internal and external collaboration with supply chain partners for better performance of organization in terms of operations and business growth. Leuschner, Rogers and Charvet (2013) stated that there is positive relationship between SCI and firm performance and it encompasses information integration, operational integration and Relational integration. Lee (2000) Supply chain integration is the secret of success in today world of intense competition.

(Kaynak & Hartley, 2008) in study on Quality management as a part of supply chain management suggest that Supplier Quality and customer focus are the two key areas of Quality management practices within the domain of SCM. Results shows that better quality management practices internally and externally within supply chain results in increased quality, financial, market and inventory management performance of the
firm. (Kannana & Tan, 2005) Worked on three areas for increasing operational performance of company; just in time, Quality management and SCM. Results showed that commitment to quality and consideration of supply chain integration results in higher operational excellence.

Yang (2004) developed a conceptual frame work to investigate the antecedents of supply chain agility on manufacturer’s performance. Technical factors (IT competencies) and coordination resource sharing (Information sharing, work collaboration, trust etc) are antecedents of SC agility which lead to cost efficiency that mediates the relationship with increased performance (Mei and Zhang, 2011). Worked on finding the impact of supply chain collaboration on firm performance and discovered moderating role of firm size on the relationship b/w SC collaboration and firm performance; so this collaborative advantage is much more mediator for small firms than medium sized and large firms.

Research on finding the impact of SCM practices on firm performance and organization’s competitive advantage it was analyzed that modern SCM practices have significant positive impact on not only firm performance but also on gaining competitive advantage among the firms because competition in this era is not only among firms but among different supply chains (Li, Nathan, Nathan, & Rao, 2006).

Kim (2009) worked on linking firm SC integration strategy with firm competitive strategy. It was found that SCI mediates the relationship between SCM practices and firm performance. Moreover both SCM practices and SCI have their effect on each other and mediates relationship with firm performance ultimately. Flynn, Huo and zhao (2010) in study on impact of SCI on performance in Chinese manufacturing sector explored the benefits derived from internal and external integration in terms of reduced inventory cost, improved lead time, accurate demand forecasting, efficient flow of material and goods among supply chain partners.

8. Barriers to supply chain integration

Following barriers are observed from literature on supply chain (Sammuel and Kashif, 2013).

- Lack of information Technology
- Lack of information sharing
- Lack of trust
- Demand distortion-bullwhip
- System incompatibility
- Lack of knowledge
- Cost of integration

Ellinger et al. (2006) investigated five barriers to SCI: these are; insufficient knowledge of the other function; lack of communication; poor working relationship; conflicting goals; and lack of direction from senior management. Moberg et al. (2003) explained barriers to supply chain execution, which were lack of trust, poor understanding, internal politics, misaligned goals and objectives, weak management information systems, short-term orientation to goals, and other supply chain complex issues. Barratt (2004) described various barriers to SCI on all levels of integration and stated that these barriers exist on tactical, operational and strategic levels of the organization. As far as it is important to know the barrier, the more important is to find the facilitators or solutions to these barriers to SCI. There are several challenges involved in management of effective supply chain which include information system misalignment, poor trust and inventory management (Handfield and Nichols, 1999).
Harland et al. (2007) in research on barriers to supply chain information integration explored that adoption of E-business into supply chain function is slower than expected. These barriers are poor strategic alignment of information strategies, lack of awareness of potential benefits of IT adoption, lack of managerial leadership and thrift in this regard in different organizational context.

Richey et al., (2010) made study on understanding the barriers in SCI and how to overcome these barriers. According to it the purpose of SCI is to achieve excellence in operations and achieve economies of scale through state of art collaboration among all stakeholders. The purpose of SCI is not fulfilled just due to adoption of modern equipments and technologies but it needs to develop such organization norms that facilitate shared work and group vision. Moreover SCM includes both internal and external integration in this regard. Gale and Hu (2009) in their paper on Milk supply chain in China which is emerged as leading country in export of quality goods at cheap prices in every sector of economy. Large suppliers of milk need to be streamlined and close to backward integration to control prices and quality standards.

The benefits of information integration within SCI are incompatible but at the same time it also gives certain challenges and barriers which are confidentiality of the information shared, cost of information technology, anti-trust regulations, the time lines and authenticity of the shared information, and the development of infrastructure that make companies to use the shared information in an efficient manner (Lotfi et al., 2013).

9. Conclusion

The literature and theoretical knowledge supports Supply chain performance of organization under the governance of facilitators to integration, in spite of the fact that barriers to integration also exist. Thus, firms may be able to maintain some level of internal focus, a degree of solidarity and a sense of commitment at all levels within value delivery chain. Yet to do so in a supply chain context, the firms must be open to being aligned, communicative, joint structured, quantified on supply chain metrics, and open to partner interdependence. Managing that balance can contribute to superior gains in service effectiveness and cost efficiency consistent with strategic supply chain goals. The truth is that integration is challenging and requires significant work to overcome traditional barriers.

References


