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Suitability of Demand Chain Management in the Context of Indian Manufacturing Industries

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Abstract **– Indian manufacturing industry has a large stake in the GDP of the country. It is in transition from attractive labour market to global manufacturing power and faces numerous challenges in its growth. In their quest for growth, they are evolving at a fast pace, and shifting from rigid and hierarchical organizational structures to more responsive and customer-centric business models. DCM is a new tool in the hands of management which is customer centric and leads to more responsive organizational structures. This work through literature review and expert opinion ventures in to suitability of DCM for Indian manufacturing industries.**

Keywords **– Demand Chain Management, DCM, Indian Manufacturing Industries.**

I. INTRODUCTION

The manufacturing firms are realizing the global competition and rapid changes in the demands of the ultimate customers. It is becoming very difficult for these firms to be competitive in providing the products of the choice of customers, due to the changes in technology, change in requirements and diversification, open competitive landscape due to globalization and many such pressures. To compete, the firms should have internal flexibility to respond to ever changing requirements and large scale integration with other firms, because no firm can compete individually.

The opening up of the Indian economy from early 1990s has offered a huge canvas of business opportunities. Rapid advances in the field of ICTs, and their deepening penetration and convergence have redefined the nature of economic and organizational relationships. On the changing global landscape, Indian organizations are looking for collaborations with appropriate partners so as to overcome challenges such as uncertainty of networks, proliferation of product variety, rapid technological evolution, and shorter product lifecycles.

The economic scenario in India is characterized by poor infrastructure, inefficient technology, paucity of resources, and inadequately trained manpower, resulting in poor quality of products and services. Inefficient regulation, high interest rates, and high tax rates increase the risk of losing employment and investment through flight of capital.

There is a need for low taxes, tight fiscal policy and monetary stability. In order to compete globally, Indian manufacturers need to benchmark themselves against quality standards and practices of manufacturers in countries such as USA, the European Union, and Japan. Nevertheless, in their quest for excellence, Indian manufacturing organizations are evolving at a fast pace, and shifting from rigid and hierarchical organizational structures to more responsive and customer - centric business models, replacing vertical business processes with horizontal business processes so as to increase organizational and process flexibility, and using ICTs to share information with their stakeholders and coordinate processes leading to effective and timely decision making and responsiveness to customer needs.

Over the last decade, India's manufacturing sector has undergone dramatic changes, and emerged as the key to meeting the ambitious eight percent growth targeted in the tenth five year plan. Because only eight percent of the workforce is employed in the organized sector, employ--ment growth in India can logically occur through the manufacturing sector. The share of the manufacturing sector in India's gross domestic product (GDP) is 17 percent (This is 35% in case of China and 31% in case of South Korea) and the goal is to raise it up to 25 percent (Confederation of Indian Industry, May, 2008) over the next 12 years.

Table 1.1. Typical characteristics of Indian manufacturing scenario.

• Use of more manual processes than automated processes
• Less use of Information and communication technology
• Handling of material is manual
• Transportation is independent rather than integrated
• Manual system to respond to more variability of demand as more SKUs are there as compared to developed countries.
• Lack of necessary sophistication, knowledge, skills and ability.
• Defensive attitude towards new and improved method.
• Lower quality standards as compared to developed countries.
• Cultural differences between trading partners.

While operations may be cost effective in India owing to lower labour cost and less restrictive regulations, the quality consciousness of the workforce (of both workers and managers) in India still lags behind the world standards.

For India to achieve the target growth of GDP of more than eight percent, along with the services sector manu--facturing needs to grow at a rate of more than 11 percent and the agricultural sector needs to grow at around four percent (FICCI Report on Indian Manufacturing, 2014). The sector wise growth rates broadly consistent with the 9.0 percent and 9.5 percent alternatives are presented in Table 1.1. The 9.0 percent target requires a significant acceleration in growth in agriculture; in electricity, gas and water supply; and manufacturing.

Table 1.2: Sector wise growth rates- previous plans and target for twelfth plan.

	IX Plan	X Plan	XI Plan	XII Plan	
Average				9%	9.5%
Agriculture, Forestry and Fisheries	2.5	2.3	3.2	4	4.2
Mining and Quarrying	4	6	4.7	8	8.5
Manufacturing	3.3	9.3	7.7	9.8	11.5
Elec. Gas and Water Supply	4.8	6.8	6.4	8.5	9
Construction	7.1	11.8	7.8	10	11
Trade, Hotels and Restaurant	7.5	9.6	7	11	11.2
Transport, Storage and Communication	8.9	13.8	12.5	11	11.2
Financing, Insurance, Real Estate and Business Services	8	9.9	10.7	10	10.5
Community, Social and Personal Services	7.7	5.3	9.4	8	8
Total GDP	5.5	7.8	8.2	9	9.5
Industry	4.3	9.4	7.4	9.6	10.9
Services	7.9	9.3	10	10	10
Source: www.planningcommission.gov.in: Planning Commission of India 12th Plan					

II. Role of DCM in Manufacturing Industries

Demand Chain Management (DCM) is a new tool in the hands of the management that deals with all assets, information, and processes to define demand followed by synchronization of various activities to fulfill demand on a real-time basis by managing flow of information and products efficiently and effectively (Agrawal, 2012). Close integration of operations between manufacturers, suppliers, and customers in DCM relies to some degree on business process reengineering (Frohlich and Westbrook, 2001). Thus, research in DCM includes Just-in-Time (JIT) manufacturing, mass customization, and use of third-party logistics (Lee *et al*., 2005). Demand Chain Management (DCM) organizations empower R&D staff to work closely with customers to develop products and processes coope--ratively (Walters, 2006). Given a precise understanding of customer needs (and market trends) it is possible for the procurement process to work with design and development to develop optimal solutions to product and process development options. Thus implementation of DCM results in overall improvement in the organization. DCM strategy appears to be the best overall approach for manufacturers to follow (Frohlich and Westbrook, 2002).

2.1. *Benefits of DCM*

The gaining importance of DCM is because of its benefits throughout the organization. Some of the benefits of DCM as mentioned by several researchers are:

Table 2.1: Select Benefits of DCM.

Benefits of DCM	Author(s), Year
Detailed customer information	Landeghem and Vanmaele, 2002; Heikkila, 2002; Canever, 2008; Rainbird 2004; Canever, 2008; Hilletofth, 2009.
Feedback on changing demand, impact of promotion, right offering.	Lee, 2001; Landeghem and Vanmaele, 2002; Rainbird, 2004; Canever, *et al*., 2008;
Better customer understanding	Heikkila, 2002; Landeghem and Vanmaele, 2002; Childerhouse *et al*., 2002; Rainbird, 2004; Jacobs, 2006; Walters, 2006; Canever, 2008; Charlebois, 2008
Increase in Customer satisfaction	Lee, 2001; Heikkila, 2002; Landeghem and Vanmaele, 2002; Frohlich and Westbrook, 2002; Rainbird, 2004; Jacobs, 2006; Walters, 2006; Canever, *et al*., 2008; Charlebois, 2008
Better service	Lee, 2001; Heikkila, 2002; Landeghem and Vanmaele, 2002; Rainbird, 2004; Canever, *et al*., 2008.
Decrease in cost	Childerhouse *et al.*, 2002; Jacobs, 2006.
Decrease in lead time	Childerhouse *et al.*, 2002; Jacobs, 2006.
Good cooperation in chain	Heikkila, 2002
Reduction in product development time	Childerhouse *et al.*, 2002.

The benefits (Table-2.1) are tangible as well as non tangible; they include reduction in lead time, customer satisfaction and also good cooperation in chain, thus indicating to organization wide improvement.

III. Observations and Gaps from Literature

The review of the literature was carried out on different aspects of demand chain, supply chain, exploratory interviews, nominal group technique, and manufacturing industries performance. Insights from the literature helped identifying the gaps in the literature. Based on the literature review following observations were made:

- In latest planning techniques in SCM, the collaborative approach considers all internal partners of the chain along with external stake holders like customer and market to satisfy the demand (Attaran and Attaran, 2007). The DCM approach, though quite similar to the collaborative approach, considers all the partners of the chain along with the external stake holders like market, customer, but with a view not only to satisfy the demand, but to drive the demand. This approach of DCM has a more holistic view of the situation and can give more realistic assessment of demand, minimizing the uncertain- -ties involved in it.
- Many researchers have developed models for DCM implementation and discussed about its performance measures (Rainbird, 2004, Canever *et al* 2008, Walters, 2006, Charlebois, 2008, Childerhouse *et al*, 2002) but there seems to be lack of consensus regarding concepts, scope and boundaries of DCM. Very few researchers have explored it in Indian context.
- The review of literature on studies on DCM drivers ha-

-ve clearly highlighted that the subject has to be dealt in the context of the concerned manufacturing and cultural environment.

The observations presented visualize clear gap in exploring the studies on DCM in Indian manufacturing industries.

IV. METHODOLOGY

It was felt necessary to understand the suitability of DCM in context of Indian manufacturing industries. Typically, the Indian manufacturing environment is slightly different as compared to manufacturing environment in developed countries owing to following reasons:

- Use of more manual processes than automated processes
- Less use of Information and communication technology
- Handling of material is manual
- Transportation is independent rather than integrated
- Manual system to respond to more variability of demand as more SKUs are there as compared to developed countries.
- Lack of necessary sophistication, knowledge, skills and ability.
- Defensive attitude towards new and improved method.
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Hence a need for deeper understanding of DCM in Indian context was felt for which NGT appears as a suitable technique (Delbecq *et al.*, 1975; Langford *et al.*, 2002; Stewart *et al.*, 2007). Based on the recommended guideline of NGT (Lloyd, 2011) number of experts were more than 20. Experts selected were majorly professionals (12 numbers), consultants (7 numbers), and academicians (4 numbers). Care was taken to select the experts with experience in handling demand at different levels. The experts belong to categories of senior managers and DGM level having more than 12 years of experience, who handled/handling the functions related to DCM. The experts were given the input from literature and the output of exploratory interviews, i.e. the indicators of DCM Table 4.2. The questions given to NGT experts were:

1. Whether DCM can be considered as a suitable technique for Indian manufacturing scenario.
2. Help us find out suitable key indicators of DCM in context of Indian manufacturing scenario.

The NGT exercise continued for 1-1/2 to 2 hrs. One by one researcher noted their observation. The key outcomes of NGT are:

a. Experts unanimously agreed on the benefits of the holistic approach of DCM and recommended its use for growth of the Indian manufacturing industries.
b. Experts suggested representing the elements of important/key indicators like environmental issues and Government policies etc. The indicators are again presented in Table-4.1 after implementing the suggestion.

Table 4.1: List of indicators (obtained from literature) and approved/suggested by experts.

Indicators	Reference
Marketing strategy	Charlebois, 2008, Rainbird 2004, Agrawal 2012
Customer satisfaction	Johnson and Fornell, 1991; Fornell et al 1996; Lee et al., 2005;
Productivity	Russel and Taylor, 2005
Efficiency	Ketokivi and Schroeder, 2004
Quality of work	Bozarth and Edwards, 1997
Competitive Strategy	Lee *et al*., 2005, Rainbird 2004, Walters and Rainbird 2006, Agrawal 2012
Service strategy	Rainbird, 2004; Walters and Rainbird 2006,
Infrastructure	Frohlick and Westbrook, 2002; Rainbird, 2004
Information and Communication	Frohlick and Westbrook, 2002; Rainbird, 2004; Walters 2006, Walters and Rainbird 2006, Agrawal 2012.
Networking	Walters 2006, Agrawal 2012
Geographic factors	Kotler, 2003, Iyer, 2011
Demographic environment	Kotler, 2003, Iyer, 2011
Economic Environment	Sharma, 2011, Iyer, 2011
Natural Environment	Kotler, 2003, Iyer, 2011
Technological Environment	Kotler, 2003, Iyer, 2011
Social Cultural Environment	Kotler, 2003, Iyer, 2011
Political Legal Environment	Kotler, 2003, Iyer, 2011
Globalization	Additional indicators suggested by experts
Liberalization	Additional indicators suggested by experts
Urbanization	Additional indicators suggested by experts
Industrial Growth	Additional indicators suggested by experts

c. Experts suggested that subject of DCM is very complicated in Indian manufacturing scenario and that these indicators should be treated in two categories:

1. Indicators which help in fulfillment of demand i.e. the enablers of DCM.
2. Indicators which help in creation of demand i.e. the challenges for DCM.

V. CONCLUSION

Literature review and observations have identified DCM, a new technique as beneficial due to its holistic and customer centric approach, which is not much used in the Indian context. It also highlights the challenges that Indian manufacturing organizations are facing of their growth in the age of globalization. To ensure growth they must change to become more customer centric and responsive. Expert opinion was obtained through NGT which confirms the observations from literature and recommends the use

of DCM for Indian manufacturing industries. Experts also recommended the key indicators of DCM in the context of Indian manufacturing industries.

VI. LIMITATIONS

The expert opinion was obtained from experts from automobile industries, inclusion of experts of other industry can make the understating more useful. The expert opinion needs the reinforcement from other deterministic techniques.

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