

Scope of Internal Supply Chain Management Benchmarking in Indian Manufacturing Industries

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Abstract—Internal supply chain management benchmarking practice is necessary to overcome manufacturing industrial performance gap. The main purpose of this research work is to combine the benchmarking and internal supply chain practices to improve the performance of Indian manufacturing industries. In this paper, the main aim is to discuss the components of internal supply chain between suppliers and customers after that explain the scope of ISCM benchmarking in manufacturing industries.

Keywords—Competitive environment, internal supply chain management components, benchmarking practice, manufacturing industries, market potential.

I. INTRODUCTION

INTERNAL supply chain management (ISCM) benchmarking practice is a hybrid approach of benchmarking practice and ISCM process. Such type of concept provides help in improving the internal supply chain performance benchmarking of manufacturing industry on the behalf of best manufacturing competitor. Benchmarking is a continuous process of improving existing performance by identifying and adapting the best practices and processes found inside and outside the manufacturing industries [1]. The motive of ISCM is to maintain the flow of funds, materials and information within industries [2]. Manufacturing industries must be prepared to change their system on the behalf of benchmarking studies. In launching a new benchmarking of ISCM project, it is necessary to decide that what standard of comparison are used to survey of competitors in other industries [3].

The hallmark of best practice industry is a sequential approach to learning and continuous improvement in internal supply chain of any Indian manufacturing industries [4]. These industries may implement the benchmarking exercise for achieving the best result in the area of internal supply chain. Finally the objective of authors is to discuss the scope of ISCM benchmarking in Indian manufacturing industries to maintain supply of items at right time whenever it is required according to customer demands.

II. REVIEW OF LITERATURE

Benchmarking refers to a process of comparing operations and performance of agencies against recognized standards and

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improving those operations to enhance the effectiveness [5]. Many industries today are doing efforts to create best-in-class internal supply chain with their substantial competitive part over their rival competitors. ISCM is a complex issue globally. A benchmark is the numerical target or reference point for taking corrective measure actions against competitors. Reference [6] explained the importance of ERP for enablers of supply chain management. Reference [7] discussed the terms and conditions for the purchasing contracts and online action with advanced computerized versions of enterprise resource planning. Reference [8] says that it is not easy to establish supply chain in effective management system. The international business standards and industry leaders are providing support for improving industries performance on the basis of benchmarking practice. There is a scope of benchmarking in E-supply chain management while there is a difference between E-supply chain format and traditional E-commerce. In summary there is a more scope of benchmarking practice in improving the internal supply chain management performance of Indian manufacturing industries [9].

A. Components of ISCM

The main objective of ISCM is only to control the supply chain flow between main activities: Purchase, production and distribution within the industry. The internal supply chain process consists of all activities between the sections from initial to final stage as shown in Fig. 1. The flow of right information is one of the most critical activities of each section in internal supply chain. An effective flow of raw material/fund/information from suppliers to customers or customers to suppliers is very important to the maintain sustainability in internal supply chain of any manufacturing industry. Internal supply chain of any manufacturing industry consists of purchase, production and distribution sections [10]. The flow of supply chain takes place in both direction forward and reverse. When flow is in forward direction then supply chain is known as forward flow supply chain otherwise it is reverse flow supply chain management.

1. Role of Purchase Section

Purchase section of any manufacturing industry controls all procedure related to materials. The important role of purchase management is just to control the activities related to purchasing & procurement of raw material [11].

ISCM benchmarking concept provides multiple benefits like: Shorter order cycle time, cost saving, reduced paper transaction, subsequent inventory reduction, rapid transmission of purchase order related information, and

supplier/buyer relationship through effective ISCM communication networks [12]. The main function of purchase process reengineering is to do the optimization of purchasing for maintenance and repair work [13]. The development of online network is only for procurement of raw material. The difficulties of online purchasing of material have been identified by researchers [14]. Out of all, some of the major issues include size of the plant, security concerns, global sourcing, contract laws and government regulations.

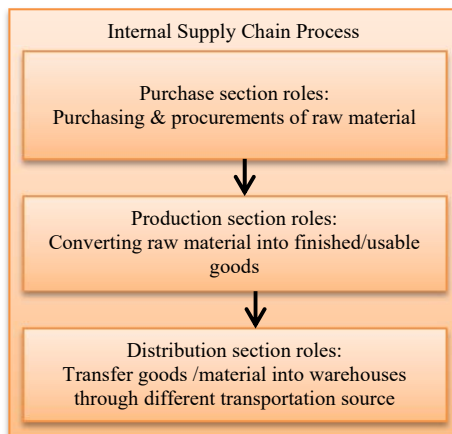


Fig. 1 Flow chart of ISCM process of Indian manufacturing industries

2. Role of Production Section

The production manager should control all activities of production of part/components/items between starting production process to last stage of production process. In case of manufacturing industries input is raw material and output is usable product. This creativity should be done by using multiple of manufacturing processes which depend upon the requirement of manufacturing product. As such, there is no hard and fast rule or guidelines to specify the function of production.

- (i) **Materials:** Production section performance depends on different properties of material like physical, chemical, electrical, mechanical properties etc. Benchmarking practice is more suitable to select better quality of product. Because if the quality of material is poor then performance of all internal supply chain is also effected.
- (ii) **Methods:** Production department has to search a relevant, rapid method to identify the proper sequence of production with available resources which can be useful to produce the goods at their desired minimum cost.
- (iii) **Machines/Equipment:** The selection of best machinery and equipment is also another main responsibility of production engineering department. The role of production engineer is to decide appropriate machine for manufacturing according to desired design of product.
- (iv) **Estimating:** Production department has to perform an estimation regarding the number of items being produced in a fixed time period, their delivery dates along with the suitable corrective measure action taken to produce goods at their minimum cost.

- (v) **Loading and Scheduling:** It is also an important role of production department. According to demands of customer, production department prepares a plan of loading and unloading of product. Production department can also evaluate that how many number of products are under hand and how many number of products are required to produce within manufacturing industries.
- (vi) **Routing:** It is an important function of production department which consist of different flow lines according to the products.
- (vii) **Dispatching:** Document/product releasing activity is known as dispatching. According to this function, production department releases the document to dispatch section and then shop floor staff follows all instruction of dispatch documents.
- (viii) **Expediting or Follow up:** Production engineer does follow up along with plan and then compares the actual products' quantity with the plan and gives feedback.
- (ix) **Inspection:** It means just to distinguish if the product is according to the design specification or not. In order to avoid such situation, an external person is given the task to verify the product quality and inspect the items of the production department.
- (x) **Evaluation:** Every industry sets up some perspectives for future concern. The production department has to evaluate itself towards its contribution. The main function of evaluation activity of production department is just to distinguish that all the activity of production department is going on or not from first stage to last stage.

3. Role of Distribution Section

The main work of distribution department is just to distribute the finished materials for small units and its transformation into different warehouses through efficient, safe and effective transformation system. The efficient movement of products and their effective distribution to relevant customer is managed through the proper coordination of inter-firm divisions since the functioning of one division affects the functioning of the other and vice versa.

B. ISCM Benchmarking Issues

There are following issues related to ISCM benchmarking:

- The decision makers are enabling to do implementation of ISCM benchmarking exercise due to overall cost incurred [15].
- For conducting ISCM benchmarking, time frame is not fixed.
- The role of team members should be clearly distinguished between benchmarking partners for efficient work.
- On the behalf of review of literature, authors have come across different areas in which multiple of researchers have completed their research work. The work has been done in the functional areas shown in Table I.

C. Literature Review Outcomes

The performance gap of internal supply chain in Indian manufacturing industries increases the scope of benchmarking in the field of ISCM [16]. There are following related major

outcomes and issues which are derived from the literature survey on ISCM supply chain and benchmarking:

- Duration of benchmarking exercise
- Partner selection
- Cost
- Information system
- Human resources in benchmarking activities

TABLE I
 FUNCTIONAL AREA IN DIFFERENT FIELDS

Serial no.	Functional Area
1	Accounting Processes
2	Banks
3	Benchmarking Operations
4	Business re-engineering
5	Career Management
6	Change Management
7	Core Competencies
8	Credit Function
9	Education
10	Employee Attitudes
11	Environment
12	Facility Management
13	Finance
14	Food and Drinks Industry
15	Health and Safety Management
16	Hotel Services
17	Human Resources
18	Information Technology
19	Quality and Productivity Management Association (1991)
20	Logistics
21	Manufacturing
22	Marketing
23	Operational Performance
24	Performance Measurement
25	Physician Workforce
26	Pre-project Planning
27	Preventive Maintenance Practices
28	Product Development
29	Public Sector
30	Purchasing
31	Research and Development
32	Retail Distribution Strategy

The main purpose of this literature is just identifying the gap between past literature review, then distinguishing the scope of ISCM benchmarking in Indian manufacturing industries. In this research, we identified that how much work have been done in the field of ISCM benchmarking [17]-[24].

A lot of literature is available on benchmarking and supply chain management. Many authors have contributed in available literature [25]. The review process first starts by providing a comparison among the earlier reviews on benchmarking and highlighting the outcome in each case. However, the present attempt of research work is different from the earlier research work.

III. CHALLENGES FOR INDIAN MANUFACTURING INDUSTRIES

Nowadays, competitor strategy identification is a typical job

for businessman. It is very difficult to identify that how competitors are providing best quality of product in minimum possible of time with minimum price. In such type of environment, benchmarking practice provides help to improve the internal supply chain performance of manufacturing industry against the standards [26].

A. Scope of ISCM Benchmarking in Indian Manufacturing Industries

The market change is the driving force which creates disturbance in Indian manufacturing industries. There are different factors such as price of product, customer requirements continuously forcing the manufacturing industries to change their existing process of manufacturing. The main function of management in internal supply chain is to manage all types of flow related to raw material/parts/products/items within industry. A multi-objective model for evaluation of information system for supply chain management has been proposed by [27]. Past experience of benchmarking will be fruitful for the planning and implementation of new internal supply chain benchmarking system of manufacturing industry. However, the top management support and due investment in training of latest tools and techniques are essential for successful application of ISCM benchmarking. The main role of information system is to do better administrative through right information and operation. There is a need to address the alignment between operations strategy and IT strategy [28]. Therefore, ISCM benchmarking practice would be helpful to maintain an effective internal supply chain system and physically distribution within industries.

IV. CONCLUSION AND FUTURE RESEARCH DIRECTIONS

ISCM benchmarking practice is a necessary part for survival of any business industry and to improve the competitiveness of manufacturing industries. As a result of the literature review, we can say that ISCM benchmarking practice is fruitful to improve the existing performance of manufacturing industry. An internal supply chain activity is driven by the need to streamline operations to achieve quality service to customers. There are many research articles on benchmarking and supply chain management, but there is a lack of critical review of the literature on ISCM benchmarking practice as shown in Table I. Internal supply chain benchmarking strategy needs to be determined by the senior executives in strategic planning. Senior managers and planners should understand the importance of internal supply chain benchmarking and realize that without support of benchmarking practice, it is difficult to provide information for making the best internal supply chain decisions. Therefore, this concept of benchmarking in the field of ISCM may be efficient for improving the existing performance of traditional manufacturing industries as compared to conventional working of manufacturing industries in India.

REFERENCES

- [1] T.E., Drozdowski, "GTE uses benchmarking to measure purchasing",

- Purchasing*, vol.94, no.6, pp. 21-24, 1983.
- [2] R., Bhagwat and M.K., Sharma, "Performance measurement of supply chain management using the analytical hierarchy process", *Production Planning & Control*, vol.18, no.8, pp. 666-680, 2007.
- [3] R.C., Camp, "A bible for benchmarking, by Xerox", *Financial Executive*, vol. 9, no.4, pp. 23-27, 1993.
- [4] M. Saad, and B, Patel, "An investigation of supply chain performance measurement in the Indian automotive sector", *Benchmarking: An International Journal*, vol.13, no.(1/2), pp.36-53, 2006.
- [5] Kailash, R.K. Saha, and S., Goyal, "Systematic literature review of classification and categorisation of benchmarking in supply chain management", *Int. J. Process Management and Benchmarking*, vol.7, no.2, pp. 183-205, 2017.
- [6] N., Boubekri, "Technology enablers for supply chain management", *Integrated Manufacturing Systems*, vol.12, no.6, pp.394-399, 2001.
- [7] M.L., Emiliani and D.J., Stec, "Online reverse auction purchasing contracts", *Supply Chain Management: An International Journal*, vol.6, no.3, pp.101-105, 2001.
- [8] R.E., Spekman, J., Spear and J., Kamauff, "Supply chain competency: learning as a key component", *Supply Chain Management: An International Journal*, vol.7, no.1, pp.41-55, 2002.
- [9] R., Van Hoek, "E-supply chains-virtually non-existing", *Supply Chain Management: An International Journal*, vol.6, no.1, pp.21-28, 2001
- [10] M., Matzko, and C., Wingfield, "Coming: a source of competitive benchmarking for retail distribution strategy", *Journal of Retail Banking*, vol.17, no.2, pp. 9-15, 1995.
- [11] S., Wang, "Managing the organizational aspects of electronic commerce", *Human Systems Management* vol.19, no.1, pp.49-59, 2000.
- [12] A., Gunasekaran and E.W., Ngai, "Information systems in supply chain integration and management", *European Journal of Operational Research*, vol.159, no. 2, pp. 269-295, 2004.
- [13] S., Croom, "Restructuring supply chains through information channel innovation", *International Journal of Operations & Production Management*, vol. 21, no.4, pp.504-515, 2001.
- [14] H., Min and W.P., Galle, "Electronic commerce usage in business-to-business purchasing", *International Journal of Operations & Production Management*, vol.19, no.9, pp. 909- 921, 1999.
- [15] Kailash, Saha, R.K. and Goyal, S., "Benchmarking framework for internal supply chain management: a case study for comparative analysis", *Int. J. Manufacturing Technology and Management*, (in press), 2017.
- [16] G.J., Balm, "Benchmarking and Gap analysis: what is the next milestone?", *Benchmarking for Quality Management and Technology*, vol.3, no.4, pp. 28-33, 1996.
- [17] M., Le Sueur and B.G., Dale, "Benchmarking: a study in the supply and distribution of spare parts in a utility", *Benchmarking for Quality Management and Technology*, vol. 4, no.3, pp. 189-201, 1997.
- [18] G. Ulusoy and I., Ikiz, "Benchmarking best manufacturing practices: a study into four sectors of Turkish industry", *International Journal of Operations & Production Management*, vol.21, no.7, pp. 1020-1043, 2001.
- [19] T.A., Foster, "Searching for the best", *Distribution*, vol.91, no.3, pp.30-36, 1992.
- [20] S.N., Vig, "Benchmarking: a select bibliography", *Productivity*, vol. 36, no.3, pp. 521-524, 1995.
- [21] G., Tatcher, "How successful companies improve through internal benchmarking", *Managing Service Quality: An International Journal*, vol.4, no.2, pp. 44-46, 1994.
- [22] J.L., Cavenato, "How to benchmark logistics operations", *Distribution*, vol.87, no.8, pp. 93-96, 1988.
- [23] H.L., Richardson, "Improve quality through benchmarking", *Transportation and Distribution*, vol.33, no. 1, pp. 30-37, 1992.
- [24] M., Zairi, and J., Whymark, "The transfer of best practices: how to build a culture of benchmarking and continuous learning- Part-2", *Benchmarking: An International Journal*, vol.7, no.2, pp.146-167, 2000.
- [25] A., Sharma, D. Garg and A, Aggarwal, "Quality management in supply chains: The literature review", *International Journal for Quality research*, vol.6, no.3, pp. 193-206, 2012.
- [26] J., Holloway, G., Francis, M., Hinton and D., Mayle, "Best practice benchmarking delivering the goods?", *Total Quality Management*, vol.9, no.4-5, pp. 121-125, 1998.
- [27] S., Talluri, "An IT/IS acquisition and justification model for supply-chain management. *International Journal of Physical Distribution and Logistics Management*, vol. 30, no. (3/4), pp.221-237, 2000.
- [28] C.F., Ho, "Information technology implementation strategies for

manufacturing organizations: A strategic alignment approach", *International Journal of Operations & Production Management*, vol.16, no.7, pp 77-100, 1996.

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