Operation Management Strategies Implemented In Manufacturing Companies: Review of Literature

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Abstract

Operations management techniques become the core of what excellence in means of manufacturing lies in the case of all industries in to manufacturing domain. The different systems and processes used in organizations have evolved and build on solid foundations of various inventions and innovations in techniques and process involved in creating a most accepted and applicable solution which will result in 'value' to the organizations. There has been existing research and literature pertaining to this topic is widely used as a base for researchers in developing new concepts and processes. This research paper aims to explore the existing research in the field of operations management from an academic point of view as well as aims at providing potential scope of academic inquiry in relations to the topic. Various disciplines of operations management such as ERP, TOC, JIT, VAE, and Lean Sig Sigma, etc. are being analyses and further opportunities in those areas are being suggested. Also an effort is being made to enquire and analyze about the possibility of an integrated approach being proposed earlier, if not aids to suggest on the logical development which could be associated with implementation of operations management in manufacturing industries as well as service organizations.

Key words: ERP, TOC, JIT Purchasing, TQM, VAE, Balance Scorecard, Continuous Improvement, Lean Manufacturing, Agile Manufacturing, Six Lean Sigma, Project Management

I- INTRODUCTION

Organizations are facing a huge risk of losing their competitive advantage in certain industries such as FMCG owing to the changing dynamics of the market and the complexities there of, due to which the role of a service operations manager is something which is becoming the order of the day, who can streamline the processes and ensure that the organizations could hold to their sustainable competitive advantage (Tiwari et al., 2007). The role of an operations management as of today in multiple organizations is not limited to delivering product quality, ensuring performance with reference to the multiple metrics and ensure a balance among them followed by delivering the manufacturing strategy taking in to account of the team size coupled with the speed of delivery and pressure from the clients, taking care of dispatch and also manage the entire customer service across the entire geographies of the existence of the organization. The tools and techniques which aid in managing these activities includes total quality management (TQM), lean six sigma, Just- in time (JIT), enterprise resource planning (ERP), agility manufacturing, lean manufacturing, balanced scorecard of key performance indicators and continuous improvement. What is essential in the point of view of operation managers is that there needs to be a cooperation strategy that should exist which would be essential for an operations manager to ensure credibility in his way of working in this globalized environment (Hayes et al., 2004, Bayraktar et al., 2007). Effectiveness is the most significant aspect of operations management could be attainable only with the integration of manufacturing with other functional areas (Paiva & Vieira, 2009). Ward et al., (1994) and Paiva and Vieira (2009) are of the view that there should be a cross functional integration, which is essential for aligning the organizations' strategic decisions to the operational levels which are as expected at the international levels.

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II - OPERATIONS PROCESS

Greasley (2009), through his research has emphasized the fact that operations process is the way through which a set of input resources are converted into products and services through the transformational processes involved in them. Tuckman (1965), has suggested a group development model which includes five stages.

Forming
Storming
Performing
Norming
Adjourning

Forming: The initial group stage wherein there is a high dependence on the leader for the guidance and direction towards identification of tasks and methods to be used as at the initial stage the rules are unclear and the availability of resources and information are limited.

Storming:

This is the stage in which the group tries to get into shape due to which there may be lots of conflicts and roles and work sharing, which may lead to a lot of resistance towards the task at this stage.

Norming:

Norming is the third stage where the team gels together because of which the conflicts are settled and because of which an understanding happens between the group members which leads to the strong commitment towards of the deliverables are established.

Performing:

The fourth stage is the performing stage where the group members are majorly independent and not controlled by a leader and decision making happens as a collective process towards attainment of the goals.

Adjourning:

The fifth stage is the adjourning stage where the group is dissolved upon successful completion of the tasks and everyone is happy about it.

Akan (2005) explains the major benefit of this framework as the one which includes all the stakeholders like the competitors, suppliers and customers in a flat structure because of which the project work is completed with minimal formalities and more emphasis is on the completion. Usually the task of an operations manager is more of a teal leader in a supply chain, this model can work as a benchmark for them for the betterment of the manufacturing company and also provides a future scope for them.

Project Management:

The way for developing a project plan that includes the definition and confirmation of the goals and objectives of the project, identifying them and the ways and means allocating resources in order to ensure the completion of the objectives which includes budgeting and timelines and other resources is called as project Management (Reh, 2012). It has been further suggested that a successful project management includes four major elements

- Resources
- Time
- Money
- Scope

For successful management for the project, it becomes imperative for managing all these elements together in a coordinated manner. Also, apart from these primary elements a project involves people, equipment, materials and time as such includes task, duration, dependencies as well as critical path. Some of the key attributes of a project management as explained by Reh (2012), are as follows:

- The project's scope is the basic part which defines the objectives, time of completion and deliverables of the entire project. It is imperative to properly define and identify the scope of the project in order to ensure a proper management of the entire project as such.

- Resources include the people, equipment and materials which are imperative to ensure the completion of the project.

- The tools to be included in project management are brainstorming, critical path analysis,, flow diagrams, Gantt Chart etc.,

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III- QUALITY MANAGEMENT TECH THEORY OF CONSTRAINTS (TOC)

TOC is an important area for operations management professionals not only because of its alignment to ensure service organizations, rather as a tool used to find out the constraints that can hamper or restrict the maximum performance experienced which could lead to the attainment of specific goals (Siha,1996).

From the perspective of Manufacturing:

- Throughput is the way through which the system is making money
- Inventory includes all the funds that are required to buy items and sell
- Operating expense focus on the funds the system invests in order to transform the inventory into throughput.

Siha (1999), states that throughput and operating expenses are common to all services while inventory may or may not be applicable to all kinds of services. Further, he is of the view that continuous improvement is the basic element of TOC philosophy and is achieved by a series of five steps including

1.Identifying the system constraints

2.Exploiting the system constraints to the best level to get benefit out of it

3.The third step is to sub-ordinate the non-constraints

4.The fourth step is to elevate the constraint

5.The fifth and penultimate step is to identify new system constraints which may develop after the transformation of the old constraints.

The most essential requirement of a manufacturing company is to ideally improvement of its performance, which can be achieved through the implementation of TOC principles which are focusing on the weakest link and ensuring that they are being fixed (Pegels and Watrous, 2005). It is in fact recognized as a continuous improvement process mainly because always there is a chance of a constraint being part of the system which minimizes it performance. The penultimate gal of operations managers is to increase the throughput and in the process reduce the inventory and operating costs thereby the performance of the organization is high.

Product Quality:

One of the most essential prerequisites for companies to ensure an increase in profit and market share is ensuring quality (Sharma and Chetiya, 2012). The tools such as Total Quality Management (TQM), kaizen, lean Six Sigma, JIT, Zero Defect, Quality Assurance (QA), Business Process Reengineering etc., are being used to ensure adherence to quality maintenance and improvement of quality management in organizations (Tiwari et al., 2007).

Total Quality Management (TQM):

Quality is more defined as the "Fitness for purpose or suitability" (Bailey et al., 2005). One of the major traits of a continuously improving organization is TQM (Besterfield et al, 2003). It includes all those things which are required to ensure quality in terms of providing products and services which are satisfying the customer's requirements. Some of the key deliverables of an effective TQM System are

- Improvement in customer satisfaction
- Enhanced delivery time
- Better quality of finished goods and services
- Reduction in inventory and wastage.
- Increase in productivity
- Efficient utilization of human resource (Kenneth & Farrington, 2006).

Quality Assurance (QA):

All the systems and procedures that are essential in order to ensure conformance and performance together with defecting prevention are coming under the purview of quality assurance (Kenneth & Farrington, 2006; CIPS, 2003; CIPS). The quality system ISO 900, is a type of quality assurance approach that represents an unique design control which aims at getting a perfect first time design in order to reduce and remove the defects at source, controlling the flow of materials with coordination with suppliers, which may use a JIT philosophy too (Kenneth & Farrington, 2006; CIPS) Companies ensure that they coordinate with the suppliers to get an assurance

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upon the products in line with the quality requirements as specified in the ISO 9000 Series, thereby reducing the defects and reduction in their costs related to quality. It becomes imperative for the operational managers to ensure that their organizations continuously adhere to these quality standards, thereby making the customers be sure about the quality of the products and services being purchased from them which ultimately will lead to maximization of revenue and profit. This not only does that, but rather in a long time horizon will impact in a positive way as create a localized as well as globally approved reputation for the organizations (IMD, 2002 cited in Da Silva et al., 2005). One of the most important aspect of TQM that operations managers have to take in to account that is it is a continuous improvement program and results are to expected on a long term horizon rather than expecting a change in the entire processes as soon as TQM is being implemented (Walsh et al., 2002 cited in Mokhtar & Yusuf, 2010).

Value Analysis (VA) and Value Engineering (VE):

It has been noticed that many operations managers have become strong advocates for VA and VE whenever there is a need for improvement in product quality, reduction on cost and increase in value for customers and getting them satisfied. Whenever there is a need to improve the product quality without any compromise on the functional requirements specified by the customers, Value Analysis and Value Engineering are being used (Sun & Zhao, 2010).

Lean Six Sigma:

A business strategy that assists the firm in order to provide methods to speed up the decision making process of the company that would increase the product quality which leads to sustaining operational excellence and performance where in the production inefficiencies are reduced is lean sig sigma (Harry & Schroeder, 2000; Sharma & Chetiya, 2012; Arnheiter & Maleyeff, 2005). The adoption of lean sig sigma will improve the organization's product quality by designing and controlling the day to day business activities, thereby reducing waste and resources and increasing customer satisfaction which results in increasing market share and offers benefits to the business unit (Kaushik et al.,: Sharma & Chetiya, 2012: Abeoelmaged, 2011).

Performance orientation:

Operations managers are required to deliver their performance on the basis of a balanced set of metrics which are acting as a challenge that requires to be addressed in order to achieve business performance in a successful manner (Niebecker et al.,2010). The two major business techniques which are being proposed to address the performance management are Balanced Scorecard and Continuous improvement.

Balanced Scorecard:

A balanced Scorecard is a non-financial measure which are through four business perspectives which are used in turn used to supplement financial measures. They are

- Customer
- Internal business process
- Learning
- Growth

The prime focus of a balanced scorecard is to enhance the operations manager's vision and strategy to daily manage the business perspectives, together with concepts and set of improvement plans which will ensure techniques for improvement of the strategic goals of the organization and to plan for the future action plans (Da Silva et al., 2005) The balanced scorecard and Performance measurement indicators are being assured on the basis of two factors. First is the target for the current year and the next is the best in class for future success.

Also an effort is put in order to ensure that the key performance indicators (KPI) are focused on indicators such as

- Managing that they lead to major business objectives
- Proper identification of key stakeholders in the project
- Agreement upon the benchmarks and requirements

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- Ascertaining the plan for testing and inspection

Kaizen:

It will be clearly stated between an ordinary company and a successful company by looking at them, creating a contemporary system, which is sustainable and ensure excellence and provide competitive advantage to them in the long run(Da Silva et al., 2005).Kaizen is defined as the process of the ongoing improvement which is involving all stakeholders from managers to workers (Imai, 1986 cited in Sun & Zhao, 2010; p.4). The three major advantages of using a kaizen system are

- Reduce the lifecycle of the product
- Simplify the development process
- Increasing product quality (Sun & Zhao, 2010).

IV - MANUFACTURING STRATEGIES

Operations managers are on the lookout for better and innovative manufacturing strategies which are the sources of competitive advantage to them owing to the increase in global competition and increasing environmental pressure. It becomes quintessential to deliver a manufacturing strategy which is the backbone of any organization in order to ensure a competitive advantage to the firms in spite of the fact that they have to take into account factors such as large teams and pressurized environments (Lin et al., 2006; Swafford et al., 2006; Lee, 2004). This has led into a rising emphasis on agile and lean manufacturing processes.

This holds more relevance to industries such as FMCG, owing to the fact that these kind of industries a different approach due to the complexities which are growing in the market conditions, the changes in technology and unprecedented growth in the customer's needs. This leads to an adoption of an agile technology in the process of manufacturing (Vandequez-Bustelo et al., 2007; Yusuf& Adeleye, 2002). The manufacturing process could be made agile if the company is able to change its operating states taking into account of the adverse business requirements and be responsive to them and in the process being able to exploit the volatility and turbulence in the adverse market conditions and converting them in to opportunities

Lean operations:

It is a systems of work organization which always strives to delivery low cost and high quality products achieved through the efficient use of resources and managing the elimination of waste (CIPS, p. 222).

Agile Manufacturing:

It is defined as the capability of a firm in order to

Cope up with the dynamic market needs

- Increasing the level of customer service
- Increasing global competitiveness
- Increase in opportunities for sustainability
- Increase the scope of profits (Gunasekaran & Yusuf, 2002).

Managing the supply chain:

The efficiency of an organization lies in its capability of managing the goods in through to dispatch and is a result of streaming of multiple operation such as

- Purchasing
- Inbound logistics
- Operations
- Outbound logistics

Enterprise Resource Planning (ERP):

An ERP is considered to be an advanced system found as through an evolution from the existing MRP system that focusses on combining the MRP II, with the other functions such as Sales and Marketing, Finance, HR, CRM and Logistics which aims at integrating all of them in order to provide more control and increase the efficiency (CIPS; p.183). A Proper implementation of ERP will lead to

- Integration of financial information
- Integration of customer order information,
- Standardizing and speed up manufacturing processes

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•Reduction in inventory (Dawson, 2002).

Customers understand a brand's equity with relation to the differences in marketing activity and in case of services it is majorly measured on the basis of the quality of services rendered to them (Gronroos (2001); Keller(2003)). Perceived quality on the other hand is measured with relation to the service performance and the expectations of the customers with reference to communication, courtesy, creditability, competencies and access which relates to the service requirements together with aspects such as,
Reliability, responsiveness, understanding and security.

V- CONCLUSIONS

It has been found that there is an impending increase in the researches being conducted in the area of operations management and the researches feels that there are additional opportunities which exist in improving the domain as such. Operations managers are entrusted with responsibilities which increase their purview and importance in organizations which will ensure long term productivity leading to better increase in customer value propositions. Several articles were being analyzed and the major area of further research is an integration of these technologies in a way as to make the role of an operations manager to be better and enriching.

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