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Operations Management

Recent Trends in Modern Operations Management

Abstract

This paper aims to explore the recent trends in modern Operations Management aiming at a better understanding of the current developments in the area. Discussing the general picture of Operations Management, this paper aims to highlight the most important and popular trends at the moment.

The paper will discuss the Lean Operations and JIT as one of the most important trend in great detail. With the help of several examples, the paper will endeavour to find out how the concept of lean is drastically affecting the way Operations Management is conceived.

Limitations of this paper include the superficial discussion of the several trends and omission of other important trends due to lack of scope.

Contents

Introduction.....	2
Recent Trends	3
Computer-aided Design and Manufacturing (CAD/CAM):	3
Shrinking product life cycle:.....	3
Supply-Chain Management:	3
Mass Customization:.....	4
Employee Involvement:	4
Sustainability, Environmentally sensitive production (Green Manufacturing):.....	4
Operations turning Lean:	4
Lean Operations – Just In Time	5
Principles of Lean and JIT	5
Lean Operations and the Toyota Production System.....	5
The Lean Philosophy – Key Issues in Implementation	6
Elimination of Waste:	7
The involvement of everyone:	7
Continuous improvement:.....	7
Conclusion	8
Bibliography	9

Introduction

The trends in Operations Management are never fads. They have very good reasons to be in existence. They incorporate a lot of lessons from the past and can affect the future in several ways (Nersesian, 2000). From the Industrial Revolution in 1769 up to the recent Internet Revolution, Operations Management has seen trends, which designed and redesigned the processes in order to make them more efficient, and businesses more profitable.

This paper will focus on a very few of such recent trends which have come up as the need of the hour and will dictate the future of the businesses. In the course of discussion, the paper discovers how Lean Operations influences all other trends popular in the field of Operations Management at the moment. Different aspects of Lean philosophy go on to define all the various trends as inseparable parts of lean operations. This makes an interesting study as to how the Operations

Management has evolved in the face of changing businesses and the recent trends give a very clear idea about what to expect in the near future, with respect to Operations Management.

While discussing Lean Operations, it becomes inevitable to avoid the case of Toyota and the success it has achieved because of its lean philosophy. Hence, the paper also touches upon relevant aspects of the case of Toyota, which have affected the way we see Operations Management today.

Recent Trends

From Division of Labour to Scientific Management and Mass Production, Operations has always tried to adjust to the need of the businesses by improvising and innovating with several trends. Similarly, the following discussion illustrates how Operations are strategized these days and what are the recent trends, which are affecting Operations Management.

Computer-aided Design and Manufacturing (CAD/CAM):

After the trend of Scientific Management and automation, the next big step was CAD/CAM. These computer-aided operations meant that all the designing and manufacturing of the product would be done with the help of computers making the operations way more efficient (Groover, 1997). These systems immensely helped in new product development and redesigning the processes.

General Motors had its first brush with computer-aided systems in 1996 and ended up saving time and money by using these systems. It helped the company launch new vehicles faster and more efficiently by making the process much smoother (ICMR, 2002).

Shrinking product life cycle:

In the past, product life cycle used to be comparatively longer and when a product was introduced, it generally stayed in the market for a longer period of time. Now with the fast expansion of technology, product life cycles have become short and almost every product gets replaced by a new product in shorter time spans (Stevenson, 2005). Due to this reason, companies are forced to introduce rapid development of new products with encouraging innovation (Smith, 1992). This has provided a new challenge and requires redesigning of operations making the process faster.

Supply-Chain Management:

Supply Chain partners are required to be more in tune with the needs of the end users as a result of shorter product life cycles, demanding customers, fast changes in technology, material and processes (Davis, 1993). And because suppliers can contribute unique expertise, operations

managers are outsourcing and building long-term partnerships with critical players in the supply chain (Christopher, 1998).

Mass Customization:

In the past, there used to be large-scale standardized mass production to gain economies of scale. Now with increased flexibility and competition, companies are forced to respond with creative product designs and flexible production processes that cater to the individual whims of consumers (Stevenson, 2005). The trend has now been changing towards customised production of goods, whenever and wherever needed. This has led to change in the way operations were designed earlier leading to better and more efficient processes (Beatty, 1996).

Employee Involvement:

In the past, employees were treated as just another input to the production process where they were treated more or less like machines and worker concerns were generally ignored. The knowledge explosion and more technical workplace have combined to require more competence in the workplace (Hanna, 2000). Operations managers now respond by moving more decision making to individual workers (Hutchins, 1998). With the development of HRM alongside, firms tend to focus more on employee empowerment, treating employees as resources that bring competitive edge to the firm. Quality management training based on lean philosophy has been very popular recently, making employee involvement an essential part of the improvement process (Clegg et al, 2010).

Sustainability, Environmentally sensitive production (Green Manufacturing):

In the past, the focus of the production was aimed on obtaining resources at lowest possible cost ignoring the damage made to the environment. Operations' managers now are increasingly getting concerned with design of products and processes that are ecologically sustainable (Johnson, 2006). That means designing and packaging products that minimize resource use, are biodegradable, can be recycled and generally environment friendly (Heizer and Render, 2010). In other words, Green production has been seen as a recent trend in operations management concerning ecological sustainability.

Operations turning Lean:

Interestingly, all the trends discussed above can boil down to the "Lean" philosophy. Be it Sustainability or Mass Customization, both the trends are two different aspects of lean operations. Businesses can lead to successful Sustainable Management, only by following a part of lean philosophy: continuous improvement or Kaizan (Johnson, 2006). In fact, Mass Customization has been possible just because JIT, since it helps customise the products according to the customers' needs or preferences without increasing costs or manufacturing time (Beatty, 1996).

Same is the case of Employee Involvement. Lean philosophy considers employees to be the most important asset of the organization and successful implementation of this philosophy depends on

the people to a very large extent (Hutchins, 1998). Inevitably, involving them at every step of the process, helps make the system leaner (Hanna, 2000).

Even Computer-aided systems and Supply-chain Management fall under the Lean philosophy since the main aim of these concepts is to make the process faster, reduce costs and avoid any waste (Groover, 1997). Continuous improvements, as an aspect of lean, help face the challenge of shrinking product life cycle by making the system more efficient and reducing waste at every step (Nersesian, 2000).

Following, the paper will discuss the lean philosophy in general touching upon all the major aspects of Lean Operations and concepts related to it, with Toyota being the case in point.

Lean Operations – Just In Time

Principles of Lean and JIT

JIT is a method of planning and control and an operations philosophy that aims to meet demand instantaneously with perfect quality and no waste (Slack et al, 2007). Lean Operations philosophy replaces the past methods of mass production where there were batches of produced goods sold at mass, generating economies of scale. The recent trend in operations management era has shifted this to Just in Time production where goods and services are produced upon the receipt of order with customizations, resultant being a drastic reduction of inventory cost (Hutchins, 1998).

Lean philosophy is based on the principle of moving towards the elimination of all the waste in order to develop an operation that is faster, more dependable, produces higher-quality products and services and above all, operates at low cost. An understanding of lean operations can be developed through the phrase that is often used interchangeably with '**lean**' – **just in time** or sometimes **lean synchronization**. This is because apparently the means to achieve the lean state are less easily explained and sometimes counterintuitive (Slack et al, 2007).

Just-in-Time and Lean Operations are often used interchangeably. However, if there is any distinction between JIT and Lean Operations, it is that JIT emphasizes forced problem solving where as Lean operations emphasize on customer understanding (Brian J. Carroll, 2009).

Lean Operations and the Toyota Production System

Research suggests that the more JIT is comprehensive in its breadth and depth, greater the overall returns will be (Fullerton and Watters, 2001).

Toyota Motor Corporation is amongst the largest vehicle manufacturers in the world with annual sales of over 9 million cars and trucks. Post WWII, Just-in-Time (JIT) and the Toyota Production System (TPS) have served as techniques instrumental in the growth of this company. TPS has

always laid emphasis on continuous improvement, respect for people and standard work practices. It accentuates employee learning and empowerment in an assembly-line environment. JIT, TPS and Lean systems, when implemented as a comprehensive manufacturing strategy, sustain competitive advantage and result in increased overall returns (Heizer and Render, 2010).

The term “Lean” in the manufacturing environment in itself refers to the Toyota Production System, established by the Toyota Corporation. Taiichi Ohno, the Father of the Kanban System and one of the former vice president of Toyota, created the basic framework for JIT and TPS: one of the world’s most discussed systems for improving productivity (Ronald M. Becker, 1998).

JIT is based on the philosophy of continued problem solving via a focus on throughput and reduced inventory. In practice, JIT means to make only what is needed, whenever needed. It provides an excellent way for finding and eliminating problems because it is easier to find problems in a system with no slack. Quality, layout, scheduling, supplier issues and excess production become immediately evident when excess inventory is eliminated.

The continuing effort to create and produce products under ideal conditions is a concept central to TPS. Generally ideal conditions would exist only if facilities, machines and people are brought together to add value without waste.

Toyota’s latest implementation of TPS and JIT are present at its new San Antonio plant, which is the largest Toyota land site for an automobile assembly plant in the US. The building itself is one of the smallest in the industry despite its annual production of 200,000 Tundra pick-up trucks. Generally modern automobiles have around 30,000 parts, but at Toyota, many of these parts are combined into sub-assemblies by independent suppliers. Twenty-one of these suppliers are on site at the San Antonio facility and transfer components to the assembly line on a Just-in-Time basis (Heizer & Render, 2010). It is because of these operations that take place in the new San Antonio plant that Toyota still continues to perform near the top in quality and maintain the lowest labour-hour assembly time in the industry.

This is how JIT, TPS, and Lean operations work and provide a competitive advantage at Toyota Motor Corporation.

The Lean Philosophy – Key Issues in Implementation

Operations Management views “Lean” as a philosophy as it gives a clear view which is used to guide the way operations are managed in different contexts. A collection of varied tools and techniques that both implement and support the lean operations form a part of this philosophy. These techniques are more generally called just in time techniques (Brian J. Carroll, 2009).

There have been many issues found in the implementation of lean philosophy. Some of them are discussed as under:

Elimination of Waste:

This is the most significant part of the lean philosophy. Waste is defined as any activity that does not add value. Toyota has identified seven categories of waste, which have become popular in lean organisations and cover many of the ways organisations waste or lose money. Ohno's seven wastes are: Overproduction, Waiting Time (Queues), Transportation, Inventory, Motion, Over-processing, Defectives.

To eliminate the above mentioned categories of waste, the Japanese developed the initial 5S's as a checklist for lean operations where they provide an easy vehicle with which to assist the culture change that is often necessary to bring about lean operations. The 5S's are: Segregate/Sort(Seiri), Simplify/Straighten(Seiton), Sweep/Shine(Seiso), Standardize(Seiketsu) & Self-Discipline/Sustain (Shitsuke) (Slack et al, 2007).

The 5S's can be thought of as a simple housekeeping methodology to organise work areas that focus on visual order, organisation, cleanliness and standardization. It helps to eliminate all types of waste related to uncertainty, waiting, searching for relevant information, creating variation and so on. The 5S's provide a vehicle for continuous improvement (Heizer & Render, 2010). Offices, retail stores, manufacturers etc have successfully implemented the 5S's in their respective efforts to eliminate waste and adapt the lean philosophy.

Involvement of everyone:

Lean philosophy is often put forward as a 'total' system. Its aim is to provide guidelines which embrace everyone and every process in the organisation. The lean approach to people management is sometimes also called as **respect-for-humans** system. It encourages and often requires team-based problem solving, job enrichment, job rotation and multi-skilling. The intention is to encourage a high degree of personal responsibility, engagement and ownership of the job (Slack et al, 2007).

At Toyota, people are recruited, trained and treated as knowledge workers. Aided by aggressive cross-training and job-classifications, the Toyota Production System engages the mental as well as physical capacities of employees in the challenging task of improving operations. Employees are empowered to make improvements, thereby respecting them by giving them the opportunity to enrich both their jobs and their lives (Ronald M. Becker, 1998).

Continuous improvement:

It is called 'Kaizen' in Japanese. Lean objectives are often expressed as ideals, such as 'to meet demand instantaneously with perfect quality and no waste'. It is a fundamental belief that getting closer to ideal lean objectives over time would lead to continuous improvement and this is why this concept is such an important part of lean philosophy. If its aims are set in terms of ideals which individual organisations may never achieve fully, then the emphasis must be on the way in which an organisation moves closer to the ideal state (Slack et al, 2007).

Under Toyota Production System, continuous improvement means building an organisational culture and instilling in its people a value system stressing that processes can be improved and improvement, indeed is an integral part of every employee's job.

Conclusion

Lean Operation has affected the Operations Management in many different ways and continues to shape the future in this area. But implementation of the lean management is always not very successful because of the inseparable principles of this philosophy.

Toyota Production System goes on to depict the benefits and scope of lean management and provides other businesses a perfect case in point. An important aspect to it is the way all the principles are associated to each other, and how this concept is best seen as a way of thinking.

The paper discussed what generally is happening in the area of Operations Management highlighting the importance and role of lean management. Interestingly, it was analysed how all other trends fall under the scope of the lean philosophy and how it plays an indispensable role in making processes more efficient. With the sole aim of reducing waste, lean and JIT end up cutting costs and making the process faster and thus makes it as a competitive advantage of the company.

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