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AN OVERVIEW OF EMERGING TRENDS IN OPERATIONS MANAGEMENT

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Abstract:

Every organization is in business because it has products, services and in some cases a combination of the two (i.e. product and service), that it offers customers as a solution to a particular need or want they have. This implies that, the very core business of every organization is to get these products and services readily available to customers, through its operations. Operations Management as the oversight responsibility towards all the activities that differently affect a manufacturing or transformation process. It involves ensuring that everything is done right every step of the way, from the input or raw material stage; through the transformation or processing stage to the output or finished product/service stage. This paper explains the various emerging trends in Operations Management.

Key words: *Operations, transformation process, manufacturing, organization*

INTRODUCTION:

Operations management is an area of management concerned with overseeing, designing, and controlling the process of production and redesigning business operations in the production of goods or services. It involves the responsibility of ensuring that business operations are efficient in terms of using as few resources as needed, and effective in terms of

meeting customer requirements. It is concerned with managing the process that converts inputs (in the forms of raw materials, labor, and energy) into outputs (in the form of goods and/or services). The relationship of operations management to senior management in commercial contexts can be compared to the relationship of line officers to highest-level senior officers in military science. The highest-level officers shape the strategy and revise it over time, while the line officers make tactical decisions in support of carrying out the strategy. In business as in military affairs, the boundaries between levels are not always distinct; tactical information dynamically informs strategy, and individual people often move between roles over time.

Operations Management deals with the design and management of products, processes, services and supply chains. It considers the acquisition, development, and utilization of resources that firms need to deliver the goods and services their clients want. The purview of OM ranges from strategic to tactical and operational levels. Representative strategic issues include determining the size and location of manufacturing plants, deciding the structure of service or telecommunications networks, and designing technology supply chains. Tactical issues include plant layout and structure, project management methods, and equipment selection and replacement. Operational issues include production scheduling and control, inventory management, quality control and inspection, traffic and materials handling, and equipment maintenance policies. Operations management is the corporate area in charge of designing, managing and tracking different processes. These processes are made up of interrelated, sequential activities through which the components and actors required (raw materials, labor, capital, information, the client, and such) are transformed into products. The key is the value added through the process as perceived by the customer, i.e. the end product has a greater value than the elements pre-process. These products are the goods and services people buy and use every day, from skis to washing machines, and medical assistance to tourism services. To create the vast array of end products the processes involved are extremely varied. For example, in a factory setting these may include assembly, control and packing, where in the airline business they are more likely to be passenger check-in, flying the passengers from A to B and getting their bags back to them. In consultancy processes, the end products will be gathering data, drafting proposals and project implementation. Beyond this, the pressure is on operations management to

make improvements in sustainability, not least in environmental areas.Operations departments are expected to incorporate eco-efficiency and eco-effectiveness principles into their processes. Further innovation is the key to competitive advantage, reduced costs and technological development, vital for the long term sustainability of the firm.

THE TRANSFORMATION ROLE OF OPERATIONS MANAGEMENT:

We say that operations management performs a transformation role in the process of converting inputs such as raw materials into finished goods and services. These inputs include human resources, such as workers, staff, and managers; facilities and processes, such as buildings and equipment; they also include materials, technology, and information. In the traditional transformation model outputs are the goods and services a company produces. This is shown in figure below:

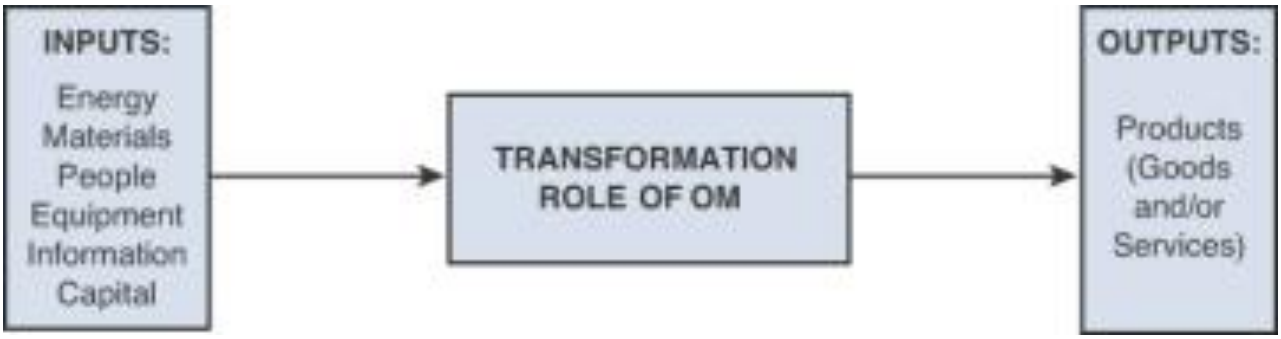

Figure: The transformation role of operations management

At a manufacturing plant the transformation is the physical change of raw materials into products, such as transforming steel into automobiles, cloth into jackets, or plastic into toys. This is equally true of service organizations. At a university OM is involved in organizing resources, such as faculty, curriculum, and facilities, to transform high school students into college graduates. At an airline it involves transporting passengers and their luggage from one location to another.The transformation role of OM makes this function the "engine room" of the organization. As a result it is directly responsible for many decisions and activities that give rise

to product design and delivery problems. The design and management of operations strongly influence how much material resources are consumed to manufacture goods or deliver a service, making sure that there is enough inventory to produce the quantities that need to be delivered to the customer, and ensuring that what is made is in fact what the customer wants. Many of these decisions can be costly. It is for this reason that OM is a function companies go to in order to improve performance and the financial bottom line.

OBJECTIVES OF THE STUDY:

1) To take an overview of emerging trends in Operations Management.
2) To explain how the field of Operations Management has been flourishing due to the new trends in this field.

RESEARCH METHODOLOGY:

This is an exploratory research. The researcher has collected the information by using the secondary data source. The data is collected by referring books, newspapers, and websites.

SCOPE OF THE STUDY:

The present study is analyzes the various emerging trends in Operations Management. The functional scope of the study is related to understand the basic meaning and significance of the techniques of Operations Management.

REVIEW OF RELAVANT LITERATURE:

1. **Ben Clegg, Jillian MacBryde, PrasantaDey, (2013) in his article titled "Trends in modern operations management",** explains the following emerging trends in operations management:

- The servitization of manufacturing – investigating how adding services in manufacturing organisations can add to their competitiveness.
- E-operations – investigating the use of new developments in enterprise resource planning systems.

- Outsourcing – looking at the bases for outsourcing and or insourcing of resources and capabilities.
- Leanness and agility – looking at ways of reducing waste and increasing value created by operations.
- Performance measurement and quality control – investigating how measuring operations can change operations behaviour.

2. **Dr. David M. Anderson, P.E. in his article titled "MASS CUSTOMIZATION, the Proactive Management of Variety"** explains that *Mass Customization* is the new paradigm that replaces mass production, which is no longer suitable for today's turbulent markets, growing product variety, and opportunities for e-commerce. Mass customization *proactively* manages product variety in the environment of rapidly evolving markets and products, many niche markets, and individually customized products sold through stores or over the internet.There is a whole spectrum of ways that Mass Customization methodologies can benefit companies. At the most visible end of the spectrum, companies can mass customize products for individual customers. The most well know category of individual customization relates to products that people wear (clothing, shoes, glasses) as well as bicycles and pagers.

Further along the spectrum is niche market customization. For instance, a company that makes telephones has only a few customers (telephone companies) who want several dozen models in many colors all with specific phone company logos. Exporters have to deal with many niche market products, usually a different set of products for each country exported; and even if the differences seem minor, the sheer variety of SKUs (stock keeping units) can have significant cost and flexibility implications. Almost all companies could benefit from expansion into niche markets *if* they could do it efficiently.

WHAT OPERATIONS MANAGERS ARE CONCERNED WITH:

- **Consistent customer experience:** "How effective and efficient are our operations across all of our customer touch points?"

- **Issue detection:** "What parts of our processes are causing issues for our customers?"
- **Detailed analysis:** "Which of our products are getting the worst feedback and how can my managers fix it?"

EMERGING TRENDS IN OPERATIONS MANAGEMENT:

1. Agile manufacturing:

Agile manufacturing is a term applied to an organization that has created the processes, tools, and training to enable it to respond quickly to customer needs and market changes while still controlling costs and quality.An enabling factor in becoming an agile manufacturer has been the development of manufacturing support technology that allows the marketers, the designers and the production personnel to share a common database of parts and products, to share data on production capacities and problems — particularly where small initial problems may have larger downstream effects. It is a general proposition of manufacturing that the cost of correcting quality issues increases as the problem moves downstream, so that it is cheaper to correct quality problems at the earliest possible point in the process.

Agile manufacturing is seen as the next step after Lean manufacturing in the evolution of production methodology The key difference between the two is like between a thin and an athletic person, agile being the latter. One can be neither, one or both. In manufacturing theory, being both is often referred to as agile. According to Martin Christopher, when companies have to decide what to be, they have to look at the Customer Order Cycle (the time the customers are willing to wait) and the lead time for getting supplies. If the supplier has a short lead time, lean production is possible. If the COC is short, agile production is beneficial.

2. Mass customization:

Mass customization can be described as "enabling a customer to decide the exact specification of a product or service, and have that product or service supplied to them at a price close to that for an ordinary mass produced alternative".

Virtually all executives today recognize the need to provide outstanding service to customers. Focusing on the customer, however, is both an imperative and a potential curse. In their desire to become customer driven, many companies have resorted to inventing new programs and procedures to meet every customer's request. But as customers and their needs grow increasingly diverse, such an approach has become a surefire way to add unnecessary cost and complexity to operations. Companies throughout the world have embraced mass customization in an attempt to avoid those pitfalls and provide unique value to their customers in an efficient manner. Readily available information technology and flexible work processes permit them to customize goods or services for individual customers in high volumes and at a relatively low cost. But many managers at these companies have discovered that mass customization, too, can produce unnecessary cost and complexity. They are realizing that they did not examine thoroughly enough what kind of customization their customers would value before they plunged ahead with this new strategy. That is understandable. Until now, no framework has existed to help managers determine the type of customization they should pursue.

3. Business Process Re-engineering:

Business process re-engineering is a business management strategy, originally pioneered in the early 1990s, focusing on the analysis and design of workflows and business processes within an organization. BPR aimed to help organizations fundamentally rethink how they do their work in order to dramatically improve customer service, cut operational costs, and become world-class competitors. In the mid-1990s, as many as 60% of the Fortune 500 companies claimed to either have initiated reengineering efforts, or to have plans to do so.

BPR seeks to help companies radically restructure their organizations by focusing on the ground-up design of their business processes. According to Davenport (1990) a business process is a set of logically related tasks performed to achieve a defined business outcome. Re-engineering emphasized a holistic focus on business objectives and how processes related to them, encouraging full-scale recreation of processes rather than iterative optimization of sub \

processes. Business process re-engineering is also known as business process redesign, business transformation, or business process change management.

4. Total Quality Management:

TQM is a philosophy of management driven by the constant attainment of customer satisfaction through continuous improvement of all organizational processes, including employee participation, teamwork, and leadership.

There are five key principles:

-MANAGEMENT COMMITMENT

1) Plan (drive direct)
2) Do (deploy, support, and participate)
3) Check (review)
4) Act (recognize, communicate, revise)

-EMPLOYEE EMPOWERMENT

1) Training
2) Suggestive Scheme
3) Measurement + Recognition
4) Excellence Teams

-FACT BASED DECISION MAKING

1) Statistical process control
2) Team oriented problem solving (TOPS)

-CONTINOUS IMPROVEMENT

1) Systematic measurement + focus\
2) Excellence Teams

3) Cross-functional process management

4) Attain, maintain, + improve standards

-CUSTOMER FOCUS

1) Supplier partnership

2) Service relationship with internal customers

3) Never compromise quality

4) Customer driven standards

Implementation of TQM

Total Quality Management emphasizes detecting potential problems before they occur. There are five major areas of TQM, which are:

• Focus on quality and prevention of problems
• Cooperation with suppliers and customers
• Continuous improvement
• Encouragement of proper climate and employee empowerment
• Use of measurements to back decisions

In the process of TQM customers are the ones who define a quality product. Not only should employees inspect products or services while performing duties, but companies must design quality products. During the design process there should be input from customers, marketing and those who assemble the final product. A company implementing TQM should cooperate with suppliers and have a focus on customer satisfaction. Vendors should be treated as business partners with all parties working to deliver a quality product.

5. The Theory of Constraints:

The Theory of Constraints is an organizational change method that is focused on profit improvement. The essential concept of TOC is that every organization must have at

least one constraint. A constraint is any factor that limits the organization from getting more of whatever it strives for, which is usually profit. The Goal focuses on constraints as bottleneck processes in a job-shop manufacturing organization. However, many non-manufacturing constraints exist, such as market demand, or a sales department's ability to translate market demand into orders.

The Theory of Constraints defines a set of tools that change agents can use to manage constraints, thereby increasing profits. Most businesses can be viewed as a linked set of processes that transform inputs into saleable outputs. TOC conceptually models this system as a chain, and advocates the familiar adage that a "chain is only as strong as its weakest link." Goldratt defines a five-step process that a change agent can use to strengthen the weakest link, or links. In The Goal, Goldratt proves that most organizations have very few true constraints. Since the focus only needs to be on the constraints, implementing TOC can result in substantial improvement without tying up a great deal of resources, with results after three months of effort.

The Five Steps of the Theory of Constraints:

1. Identify the System Constraint

The part of a system that constitutes its weakest link can be either physical or a policy.

2. Decide How to Exploit the Constraint

Goldratt instructs the change agent to obtain as much capability as possible from a constraining component, without undergoing expensive changes or upgrades. An example is to reduce or eliminate the downtime of bottleneck operations.

3. Subordinate Everything Else

The non-constraint components of the system must be adjusted to a "setting" that will enable the constraint to operate at maximum effectiveness.

4.Elevate the bottleneck

This is the step most people will intuitively apply first: add more people, more machines, more training, more tools, more of everything. We only take this step when all the ‘free’ improvements have been performed. We can elevate by:

- Adding more people or machines
- Training and mentoring
- Better tools, faster machines
- Switching to a different technology

5.And again!

When we've applied one improvement and have seen a positive effect, we go back to the beginning:

- Is our goal still valid? Is our measurement of throughput still correct?
- Where's the bottleneck? After some improvements we may have solved our worst problem. As there's always a bottleneck, our second-worst problem gets a promotion. We now need to focus our attention on the new bottleneck.

5. Total productive maintenance:

One of the main objectives of TPM is to increase the productivity of plant and equipment with a modest investment in maintenance Total Quality management (TQM) and Total Productive Maintenance (TPM) are considered as the key operational activities of the quality management system. In order for TPM to be effective, the full support of the total workforce is required. This should result in accomplishing the goal of TPM: "Enhance the volume of the production, employee morale and job satisfaction."

6. Lean manufacturing:

Lean manufacturing, **lean enterprise**, or **lean production**, often simply, "**lean**", is a production practice that considers the expenditure of resources for any goal other than the creation of value for the end customer to be wasteful, and thus a target for elimination. Working

from the perspective of the customer who consumes a product or service, "value" is defined as any action or process that a customer would be willing to pay for.

Essentially, lean is centered on *preserving value with less work*. Lean manufacturing is a management philosophy derived mostly from the Toyota Production System (TPS) (hence the term Toyotism is also prevalent) and identified as "lean" only in the 1990s. TPS is renowned for its focus on reduction of the original Toyota *seven wastes* to improve overall customer value, but there are varying perspectives on how this is best achieved. The steady growth of Toyota, from a small company to the world's largest automaker, has focused attention on how it has achieved this success.

7. Six Sigma:

Six Sigma is a set of techniques and tools for process improvement. It was developed by Motorola in 1986, coinciding with the Japanese asset price bubble which is reflected in its terminology. Six Sigma became famous when Jack Welch made it central to his successful business strategy at General Electric in 1995. Today, it is used in many industrial sectors. Six Sigma seeks to improve the quality of process outputs by identifying and removing the causes of defects (errors) and minimizing variability in manufacturing and business processes. It uses a set of quality management methods, including statistical methods, and creates a special infrastructure of people within the organization ("Champions", "Black Belts", "Green Belts", "Yellow Belts", etc.) who are experts in the methods. Each Six Sigma project carried out within an organization follows a defined sequence of steps and has quantified value targets, for example: reduce process cycle time, reduce pollution, reduce costs, increase customer satisfaction, and increase profits. These are also core to principles of Total Quality Management (TQM) as described by Peter Drucker and Tom Peters (particularly in his book "The Pursuit of Excellence" in which he refers to the Motorola six sigma principles).

The term *Six Sigma* originated from terminology associated with **manufacturing**, specifically terms associated with statistical modeling of manufacturing processes. The maturity of a manufacturing process can be described by a *sigma* rating indicating its yield or the

percentage of defect-free products it creates. A six sigma process is one in which 99.99966% of the products manufactured are statistically expected to be free of defects (3.4 defective parts/million), although, as discussed below, this defect level corresponds to only a 4.5 sigma level. Motorola set a goal of "six sigma" for all of its manufacturing operations, and this goal became a by-word for the management and engineering practices used to achieve it.

8. Just-In-Time Inventory System:

Just-in-time (JIT) inventory systems greatly reduce inventories. The philosophy of a JIT system is that materials should arrive exactly as they are needed in the production process. Many large companies use this type of inventory system as opposed to warehousing large amounts of inventory at alltimes. The system requires careful planning and scheduling, and extensive cooperation between suppliers and manufacturers is needed throughout the production process.

Advantages:

Just-In Time frees up resources and space that can be used elsewhere since you are not investing in a large amount of inventory. JIT requires an integrated plan for the entire firm. By careful planning and scheduling, JIT practically eliminates buffer stocks. The integrated operation environment of JIT can produce substantial savings. Of course, if a high degree of coordination and planning is impractical for a business, JIT does not work.

Disadvantages:

Implementation and set up costs could be substantial as you will have to move from one inventory system to the JIT system –Investment in training would be required to bring employees up to speed. The manufacturing process is redesigned to allow as much flexibility as possible by reducing the length of production runs. Reducing setup costs will allow the firm to use much smaller production runs and achieve more flexibility.Supplier relations and potential delays could be detrimental while using JIT inventory. The firm must work closely with its suppliers for JIT to work; the supplier depends on the manufacturer, the manufacturer depends on the supplier and the customers depend on both. Delivery schedules, quantities, quality, and instantaneous communication are all part of the system. The system requires frequent deliveries of the exact

amounts needed and in the order required. Careful marking-often bar coding is necessary. Therefore, there must be good relationship.

CONCLUSION:

Efficient management of operations is of very utmost importance for both the survival and success of any firm. To ensure that the organization remains competitive in the global business environment, it must ensure a cost effective operations management process within the organization. Moreover, the management team is to be familiar with the world class operational guidelines and is to implement them to be effective. Over the years various techniques are emerging in the field of Operations Management.

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