

Operations Management Research Paper

Introduction

Operations management broadly entails the efficient and effective administration of business operation practices in an organization to maximize profits. Efficiency is the output-input ratio, and it shows workforce productivity, warehouse productivity, machine productivity and raw material productivity. On the other hand, effectiveness is about the end product or service concerning quality, price, availability, flexibility and ecological friendliness. Therefore the analysis of internal processes is core to operations management. Organizations need proper management to achieve their objectives. Today's managers need knowledge of management theories to face the challenges faced by their organizations (Mahmood, Basharat & Bashir, 2012).

Several leaders have invented theories to help solve the dilemma of greater productivity in both manufacturing and service providing organizations. Some ideas have led to significant breakthroughs in automobile industry like the case of Edward Deming principles application in Japan (Kovach, Cudney & Elrod, 2011). This research paper broadly discusses five leaders whose contribution to operational management is of paramount importance. These leaders are as elaborated below;

Frederick Winslow Taylor

Frederick Taylor developed the scientific management theory also referred to as time and motion study in the nineteenth century. He developed it at a time when technology was changing the means of production and managers needed to increase production efficiency to raise consumer satisfaction. Technological advancement challenged traditional production practices and managers needed more efficient ways to satisfy customers (Ehiobuche & Tu, 2012). The goal of the theory was to maximize productivity. His aim of developing the theory was to solve labor problem (Mahmood et al., 2012). In his quest for optimizing efficiency, Frederick Winslow Taylor studied how people worked and its effect on worker productivity. He looked at work methods and individual workers which resulted in standardized job and time study (Sun, 2011).

In his experiments, he revolutionized metal cutting and doubled the speed. He also increased shovellers productivity from sixteen to fifty-nine tons per day and significantly reduced the number of yard workers from five hundred to hundred and forty. Fredrick Taylor used scientific technique and restricted extra movements in the course of work to raise productivity. He strongly advocated for worker training and labor division. Managers are supposed to concentrate on instruction and science while workers perform work. In his scientific management theory, Taylor

introduced four principles to increase efficiency which remains applicable to every kind of human activity (Mahmood et al., 2012).

The first one is the principle of the science of work which refers to studying the job in practice now and generating better means of doing it. It entails collecting data on time and motion and subjecting it to trial and error method to determine more efficient ways of performing specific tasks. The principle focused on understanding the job at hand which replaced working by natural sense and simple habit (Ehiobuche & Tu, 2012).

The second principle is scientific worker selection which means selecting employees based on their skills and assigning them specific jobs accordingly. Fredrick Taylor discouraged random assignment of employees to any jobs available and advocated for worker suitability to the task at hand. The principle focuses on motivation and capability to assign members of staff different projects to attain maximum efficiency (Ehiobuche & Tu, 2012).

The third principle is worker scientific education and development which refers to teaching employees the rules governing new methods. Selected workers are trained on their specific jobs to attain the maximum result. Labor productivity determines reward and payment meaning that higher achievers are given greater incentives (Ehiobuche & Tu, 2012).

The fourth principle is the equal division of responsibility and task between managers and workers for efficient and economical completion. It focuses mainly on establishing a just level of performance and rewarding higher performance. Managers should concentrate on training and planning allowing the workers to carry efficiently on with their tasks (Ehiobuche & Tu, 2012). The results of “time and motion studies” made Frederick Taylor to conclude that some people are more efficient than others in performing a given task and managers should seek to employ such people. Therefore, choosing the right people for a job leads to workplace efficiency. Frederick Taylor’s principles are still used in the modern world as many organizations pay their workers according to their productivity.

Frank and Lillian Gilbreth

Frank and Lillian Gilbreth lived in the twentieth century as husband and wife. They improved Frederick Taylor’s methods on time and motion study by subdividing each task into small components, scientifically reorganizing each job component and finding more efficient ways of performing each segment (Mahmood, et al., 2012). Frank led to the invention of process charting which aimed at all work elements whether valuable or not. Lillian on the other hand concentrated her attention on psychology by looking at worker’s motivation and the effect of attitude on a process outcome. She studied ergonomic worker issues such as heating, fatigue, and lighting (Sun, 2011).

In their experiments, they subdivided the movement of employees' hand into seventeen different units called therbligs for analysis. The aim of the study was the elimination of wasteful actions. The study led to the development of a new work method termed as speed work. From the experiment, they concluded that worker efficiency is raised by reducing therbligs number (Ehiobuche & Tu, 2012).

The theory found that there was only "one best way" to undertake any task and efficiency could be increased by replicating it throughout the tasks (Ehiobuche & Tu, 2012). Therefore, the challenge is to find this one best way. To understand whole task managers need to direct their efforts to the incremental study of time and motion. Therefore there are similarities between Frederick Taylor's theory and Frank and Gilberth's theory of operations management.

Eli Whitney

Eli Whitney contribution to operational management was the concept of interchangeable parts. He is credited with the invention of the first cotton gin during the time of industrial revolution in America when labor was a scarce resource (Sun, 2011). He also used this concept in manufacturing ten thousand muskets for the United States army at a very low price. Interchangeability of parts concept means the creation of identical parts that can be mass produced and replaced. The parts can then be fitted together to create the final object like firearms. The goal of this concept is to eliminate the need for the large and skilled workforce which can be expensive to any organization (Sun, 2011).

The idea of interchangeability of parts allowed Eli Whitney to reduce cost in mass manufacturing significantly. Machine specialization solves the problem of labor constraint and also eliminates duplication of work. The concept allowed more work to be done in a short duration of time, therefore, increasing efficiency (Sun, 2011). Eli Whitney's theory was thus different from the other two approaches discussed above.

Edward Deming

Edward Deming teachings and theories argued that product defects are not as a result of careless workers, but rather management shortcomings and that quality cannot be improved by inspection. He based his idea on the system of profound knowledge which has become an effective management theory for organizational transformation. The effective application of its practices and principles by organizations can lead to cost reduction through reducing rework, waste, staff litigation and attrition while increasing worker satisfaction, customer loyalty, quality, and profitability. This system has four key elements namely; theory of system, knowledge, variation and psychology (Kovach, Cudney & Elrod, 2011).

Appreciation of a system entails understanding all the processes involving the producers, suppliers, and customers of goods and services. A system approach to management leads to quality improvement of products and services since all interactions and connections work together to achieve a common goal. A system combines both external and internal factors to achieve a steady state which determines its output but not individual elements (Kovach et al., 2011).

Knowledge of variation proposes that all measurable factors are subject to vary. System flexibility will cause normal variation while particular causes will lead to defects. Managers ought to eradicate the particular causes while domineering normal variation to ensure products' quality (Kovach et al., 2011).

The theory of knowledge is based on the premise that human beings do not know everything. Whatever they know has limits. However, knowledge can be increased over a period through learning and experience. Knowledge of psychology entails understanding the human nature. People are different regarding their capabilities and abilities. Individual performance is largely governed by the system that he works in (Kovach et al., 2011).

To improve organizations effectiveness, Edward Deming provided fourteen important principles to be followed by management. They include; creation of consultancy of purpose, adoption of a new philosophy, continuous training and leadership, eradication of fear among the workforce, constant improvement of the system, elimination of slogans and workforce targets, elimination of barriers between departments, continuous self-improvement and education, and ending dependence on inspection. The principles ensure total quality management in any organization. Edward Deming understood the importance of quality in ensuring business success. (Kovach et al., 2011).

Problem-solving is a critical function of management. It requires due diligence of the issue at hand and thorough consultation. Edward Deming provided the plan-do-study-act cycle to help in solving problems which he referred to as the learning cycle. It shows the steps taken by management to ensure continuous product improvement (Kovach et al., 2011).

The plan step involves identification of a goal, formulation of a theory definition of success metrics and putting the plan into action. The do step involves the implementation of the components of the program. The study step involves monitoring the outcomes for signs of success and progress or areas of improvement. The act step is where the results of the learning process are used to make proper adjustments. Managers should follow this cycle to improve their products continuously. Edward Deming noted the presence of barriers that hinder management from continual improvement. He described the most serious barriers as deadly diseases of

management. He advocated for complete eradication of such obstacles for an organization to thrive in business (Kovach et al., 2011).

The first barrier is the absence of consultancy of purpose. HEdward Deming emphasized the need for seeking advice in product development for the product to sell and keep the company in business. The second is emphasizing on short term gain is detrimental to the long-term performance of the firm. The third is the assessment of the performance that excludes so many factors contributing to success. The fourth is management mobility and excessive costs. Edwards Deming concluded that continuous quality improvement is a major factor in ensuring market access. Workers ought to be provided with the necessary tools and ample working environment to ensure better quality. He depicted that inspection does not guarantee quality (Kovach et al., 2011).

In conclusion, the above-discussed leaders share some common ideas regarding operational management theories. Elimination of non-value added elements is evidenced in all the heads' arguments. Both Frederick Taylor and Edwards Deming acknowledge the importance of continuous training of workers to attain maximum results. Both Frank Gilbreth and Eli Whitney have argued from the premise that reducing the number of repetitive motion could increase efficiency. The knowledge of psychology and laborer satisfaction in ensuring efficiency in the workplace is embodied in both Lillian Gilbreth's studies and Edwards Deming's principles. Both Frank Gilbreth and Frederick Taylor based their arguments on time and motion studies (Mahmood et al.,2012).

Nonetheless, these leaders differ in many areas. For instance, Frederick Taylor argued from the premise of the division of labor while Edwards Deming presented the system approach where all the people in a company work together as a single entity. Frank Gilbreth pinpointed that there is only one way of performing a task efficiently while Frederick Taylor relied on scientific management principles. Eli Whitney approached efficiency from interchangeability of parts perspective whereas Frank Gilbreth directed his efforts to motion studies. All in all, these theories of operations management are being used in today's organizations and improvement witnessed.

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