Operations Management: Oil and Gas Report

Introduction

Operations management is a branch of management that deals with the designing and supervision of operational processes in a business organization. Operations management covers the responsibility over all processes that involve the production of goods and services as well as the delivery of such productions to the final consumers.

In its duties, an operations management department ensures that processes are planned for and executed in an efficient and effective way to satisfy the needs of the organization and its customers. This paper seeks to discuss concepts of operations management.

The paper will look into the history, functions, case studies, advantages, disadvantages and factors that affect the department among others. The paper will then look into the operations management's involvement in oil and gas companies.

Operations Management

Business enterprises entail the provision of goods and services to their immediate customers. For the finished goods or offered services to be available to consumers in a state that will satisfy the needs and desires of the consumers, measures must be undertaken by the producing organization to ensure that quality, quantity as well as the time frame of the production is appropriate with respect to the demands of consumers.

Meeting the needs of consumers is, however, a process that begins with the search for raw materials which are then processed to be goods and finally supplied to the consumers.

Processes of activities such as extraction of raw materials or resources, their transportation, their processing and their final distribution involve operational activities. It is the move to supervise and manage these activities that derives the basis of operations management. Operations management ensures "effective management of resources and activities that produce or deliver goods and services of any business" (Sox 1).

Operations management therefore involves the management of "people, materials, equipments and information resources that a business may need" (Sox

1) in its daily activities. The department thus outlines and then manages all that pertains to the production of goods and services.

The operations management is actually dominant in almost every stage of any given supply chain and is diverse with a variety of titles that at time can include “production planner, inventory manager, logistics manager, procurement manager and supply chain manager” (Sox 1) among others.

History of Operations Management

The history of operations management stems all the way back to the eighteenth century. In the management of production activities, operations changes were, for example, realized in the labor system. In England, for instance, the textile industry registered operational changes with human labor being replaced with the use of machines. Inventions of industrial equipments also lead to adjustment in methods of production in the textile industry at the time.

In the year 1785, steam engine was invented providing more options in the operations field. Administration of operations activities in business aspects, however, took its significant development in the twentieth century with introduction of theories and principles over how operations should be sufficiently managed. In the year 1911, for example, Fredrick Taylor developed operations management principles that involved a scientific approach.

Under his postulations, Fredrick established that the processes in a production activity can be monitored and analyzed using a scientific approach. According to him, the production processes required a deep understanding for an effective and efficient management approach. Another idea over management that he presented was the fact that people are different in nature and an understanding is necessary so that an individual worker can be placed in the kind of job that he or she can do best.

After identification of an individual’s best suited department of work, a provision for training is made for better work output by the individual. The idea of motivation to workers to improve on the outcome of operational processes was also provided for by the theory which in addition established that the management of an organization should be distinguished from the entity’s workers.

Taylor established the basis of improving the productivity of employees as well as machinery that an organization employs in its production process. Further developments in operations management was realized in the motor industry with introduction of “assembly line manufacturing” by Ford company (Business 1).

Operational procedures were developed for the production of vehicles that were cheap and at the same time long lasting. In this approach, the company had to adopt production techniques that would help them cut on their production cost and at the same time enable them to produce durable products.

The company then adopted a “vertical integration technique” (Business 1) and a well “coordinated supply and production” (Business 1) activities. Operations management was then advanced to consider strategies in production processes that would give companies advantage in the market for their products.

Major interest was then developed in the management of human resource as an approach to operations management. Factors that affected the level of productivity of workers were by the year 1930 being researched on with the aim of establishing optimal conditions for better productions. Later developments then involved the application of technology in designing and monitoring operation processes in organizations.

Operations management is however still on its development with focus being made on its elements such as “market focus, globalization, quality management systems, supply chain management and business process analysis, improvement or reengineering” (Business 1) among others. The history of operations managements is therefore based on introductions of new methods and technologies that are applicable in production processes.

Developments such as standardization, establishments of factories, specialization and division of labor in the eighteenth century were therefore the foundation of development of the field of operations management. The developments were later enhanced by establishment of mass production approach in operations, quality management and the later developments in technology that enriched the operations management department towards the end of the twentieth century (Khanna 8).

Factors Affecting Development of Operations Management

Operations management has, along its, history been characterized with a lot of changes that have ensured its evolution over time to its current level. One of the developments that the management has realized is for instance the diversification of its areas of application in any given institution.

Formerly, the operations management was an activity meant for the production processes in factories only. The departments that immediately surrounds manufacturing such as distribution sectors were then integrated with manufacturing to form a production system.

The later inclusion of service provisions into the department in the second half of the twentieth century was also a development. These changes in the structure of administration in the operations management department have been driven by a lot of factors in the business environment. One of the drivers to changes in the operations management has been the wave of globalization in the business environment.

Globalization moved to integrate the world into one economy in which trade barriers were greatly reduced or eliminated by governments and this had impacts on organizations. Former steps that were taken to protect domestic industries from international competition were liberalized giving more freedom to international trade. Consequently, competition in every market was increased following infiltration of markets by foreign investors.

The increased competition as instigated by globalization has been a drive to changes in the department of management. Firms have continuously been forced to look for appropriate avenues to maintain the customer satisfaction levels together with efficiency and affectivity in their production processes for profitability in the price competitive markets. This has therefore put pressure for critical adjustments in the management (Rowbotham, Azhashemi and Galloway 12).

The concept of “total quality management” as developed towards the end of the twentieth century also instigated a significant change in the structure of organizations (Rowbotham, Azhashemi and Galloway 12). Under the management approach, all operations were to be managed together so as to enhance efficiencies in processes and qualities in productions.

The theory also rooted for an establishment of a manager to be in charge of the human resource that deals with operation processes in an organization. The theory also outlined the requirements for operations managers. The need to empower individual employees in an organization’s operations has been another drive to the recent developments in the departmental management.

The move to improve productivity of individual groups or members of teams within organization, a management of employees’ needs and capacities became a necessity for their empowerment in decision making and productivity. The need to empower employees therefore modified the roles in the department. Developments in technologies have also been shaping the approaches in the departmental management.

New technologies such as information and communications technologies have had a direct impact on the management. Developments in communication

systems have for instance been shaping the organization and control aspects that are functions of operations managers. Approaches to planning and designing of operation processes have also been transformed by developments in technology.

The management's monitoring and evaluation techniques have been greatly transformed from its former dependence on manual techniques to electronic applications. The invention of computers and other electronic devices have greatly transformed activities and approaches in operations management (Rowbotham, Azhashemi and Galloway 13).

The general need for improvement in services offered to the general public has also been affecting the need for approaches to improve on operations in different sectors. This has resulted in further development of principles for aligning operations to meeting desired objectives. The general forces of competitive environments and the need for increased productivity and profitability have been dictating developments in the department of operations management (Rowbotham, Azhashemi and Galloway 13).

Principles of Operations Management

With the main aim of operations management being the improvement in processes in an organization, the management applies a number of approaches to achieving its objectives. As a tool to solving problems that arise in operations, a number of principles have been developed to aid operations managers in improving the efficiencies of their processes.

Principles of operations management are applicable through the management system in accordance with the sub departments of operations management. One of the departments of operations management with an established principle is the "process capacity management" (Bruner 128). Capacity management deals the productivity level of processes in relation to efficiency.

For a manager to ensure an understanding of production processes and how such processes can be managed, an understanding of the factors that affects such processes is a necessity. It has been established that in order "to increase capacity, increase the limiting resource" (Bruner 128). If the production process is experiencing a limitation in any of its necessary resources, inefficiency will be established with respect to this process which will then be transferred along the production chain to subsequent processes.

The principle in relation to capacity efficiency therefore demands that the limited resource be identified through analytical variations and measures taken to appropriately increase the resource. Another principle in operations management

stipulates that “capacity depends on the configuration of processes” and that “product structure and process structure should be matched appropriately” (Bruner 128). It has been established that different production processes requires different approaches.

A systematic approach with respect to a production process may be successful in efficiency but fail in a different production process. Efficiencies in processes also depend on the individual commodity that is being produced. Successful operations process therefore demand for an understanding of the process as well as that of available approaches to the operation. Compatibility is then compared before steps are taken towards operations (Bruner 131).

The inventory department of an organization is also an important part of the operations management. Having its direct impact on the production processes, principles of inventory management are critical to the parent operations management.

One of the establishments in inventory provides that “the more production processes and quality are improved, the more inventories can be reduced without increasing the risk of short falls” (Bruner 134). This provision is in relation to balancing the movement of raw materials, work in progress as well as finished product in an organization’s system.

The balance which is meant to control the cost of handling inventory as well as ensure an on demand availability of inventory is thus an essential. A reduced level of inventory, with consideration of demand, helps in reducing costs due to management of inventory especially in storage. Inventory management also calls for proper management of interaction time with customers during service delivery.

This is to help reduce losses in time or consequential cost due to delayed service delivery. Quality management of operations also has established theories for efficiencies. Poor quality is for example established to have costly impacts in operations.

Though ensuring quality can involve a lot of inputs, it is advantageous to the whole process. With increased quality, in a process, wastages due to defective productions are reduced or even eliminated. These among other established principles in the operation processes are elements of operations management (Bruner 140).

Functions of Operations Management

The fundamental role of the operations management is to ensure that it understands the whole operation process for an effective management of the

activities that are involved. The management therefore must understand its aims which should include elements like “quality, speed, dependability, flexibility and cost” (Rowbotham, Azhashemi and Galloway 6).

Establishment of optimum quality and time in operations will for instance be positively reflected in the desired efficiency and effectiveness in delivery of goods and services to customers. Developed level of flexibility and dependence on the other hand offers an organization a basis to control negative external forces that present threats to the organization’s operations.

The understanding of the aims and the environment is thus a fundamental to an operations manager. It is also the duty of the operations management to ensure that processes are not stagnated at a given level of efficiency and productivity. Even as targets are obtained with respect to efficiency and even speed, satisfaction in a profit making organization is only derived at optimum levels. Measures to establish and drive operations to improvements lies with the operations management (Rowbotham, Azhashemi and Galloway 8).

From the definition of operations management, it entails the provision for and the management and control of activities of the production and delivery of goods and services to the final consumer. Such management focuses on the aim to optimize efficiency and effectiveness of processes that are undertaken in an organization.

In pursuit of these objectives, operations management in any given organization has responsibilities that include “planning, organizing, staffing, leading, and controlling” elements in the organization’s production processes (Haynes 4). Planning, as one of the functions of operations management is a fundamental aspect not only to a particular operation, but to an entire supply chain and even the entire organization.

The operations management is charged with the responsibility of making plans for the processes that are involved in the movement of inventory through out an organization. The management’s function of planning involves taking future forecasts into considerations and making appropriate decisions regarding the organization’s operations. In planning, the management makes decisions into “the activities and processes” that are involved (Haynes 4).

This will include determining and ensuring that all necessary steps in operations are properly fixed in the organization’s schedule. The planning aspect of the management also determines the locations of operational equipments. The production process being extensive with distance factors with respect to locations of raw materials or the final consumers, the management makes decisions on where to locate the organization’s equipments for production processes.

This is done with consideration to cost, distance and time factors from both the source of raw materials and the organization's customers. The planning process also determines whether elements needed in the organization's processes are supposed to be purchased from other parties or whether they are to be produced within the organization itself. Cost factors as well as quality and efficiency plays an integral role in this aspect.

The management conducts analysis into the determination of with of the options will suit its organization better. Considerations such as whether the organization can make such productions at a lower cost or in a more reliable way determine the direction of such decisions (Haynes 6).

Decision over "what products to make" and the exact moments for such productions also fall under planning by the operations management. In consideration of market trends and in liaison with other departments, whether in the organization or external consultants, the operations management makes plans for timely productions that will ensure customers satisfaction as well as the correct commodities and brands according to market needs (Haynes 6).

Once planning has been done as to the activities, locations, time and the items to be produced, the operations management assumes the role of organizing processes. Under its role as an organizer, the management outlines the activities to be done as well as when such activities are to be undertaken. The department also ensures allocation of every activity in the chain to individual workers. Staffing is another function that is undertaken by operations management.

The process of staffing begins with the search for individuals to fill vacancies in the organization all the way to internal promotions. The management will therefore, according to the needs of its organization make provisions for recruitments, selection, orientation and the continuous training of its employees. The first step in staffing involves the determination of the skills and expertise that the organization requires.

This is then followed by sourcing and selection of qualified individual with potential to create the desired input. The operations management also makes decisions over the kind of training that is offered to its staff. The decision of whom to fire and when also lies with the operations management. It is also the function of the operations department to offer leadership role over processes and activities in its organization.

The leadership role of the management is realized with its authority to make decisions over all processes in the organization. It thus determines course of actions to be taken at any step of the production chain. It also ensures that such

orders are properly communicated to intended recipients. Having recruited and employed human resource, the operations management also ensures employees' well being.

It provides for support measures to employees as well as ensuring avenues for solving problems that may arise to face the staff. The management also has the role of controlling processes in the organization. It undertakes measures to ensure that the final output of the organization's processes meet the desired quality. With this respect, the management ensures that working conditions and productivity are controlled to optimization (Haynes Romanda, 6).

According to Elearn, planning and control is a necessity for the operations management following the process of designing operations in an organization. The author argues that "operations planning and control is concerned with ensuring that the day-to-day production process proceeds smoothly" (Elearn 57). In the planning process, the management establishes objectives that are supposed to be achieved in the operations.

The allocation of activities to time and resources is then followed by scheduling to appropriately align "work patterns, processes and demand and supply" (Elearn 57). Assessment of all processes is then conducted with adequate monitoring and evaluation to ensure that the processes are implemented according to plans (Elearn 57). The organizational duty of operations management that covers decisions as to how operations are to be undertaken offers directions as to "what task will be done, where, when, and by whom" (Langabeer 16).

The role also covers management of the duties of individual employees and interpersonal relationships between individuals in the organization. Efficiency of such administration can be adequately aided by the use of diagrams to monitor and influence individuals and their inputs for adequate productivity (Langabeer 16).

Brown on the other hand expresses the functions of operations management in terms of the immediate subject of their jurisdiction. One of the functions of the operations managers is the management of human resource. Following an emerging trend of "flattening of organizational hierarchy", organizational structures have been transforming to teams working under operators.

An operator is then given the task to manage his or her team with respect to all aspects of human resource management. The operator is similarly in the power to manage assets and even expenditures with respect to the activities under his or her jurisdiction (Brown 17).

Operations Management Strategies

Strategies refer to the process of establishing objectives to be accomplished. Strategies in operations management are therefore those approaches that are implemented by the management in its functions such as planning, organization and control among others.

According to Lowson Robert, strategic management in operations includes "strategy formulation, strategy implementation and strategic control" (Lowson 42). Strategies adopted by an organization are supposed to cover both internal factors of an organization, the organization's environment as well as the "firm's ability to add value to what it does" (Lowson 42).

Considerations such as the manner in which the management will supply the products of the organization, the level of expertise that will be required in the production processes, the levels of flexibilities that will be involved in operations among others are made prior to establishment of strategies. Since the aim of management strategies is to make improvements in processes and results, strategies often outline changes that are necessary to help the management and the entire organization to achieve its goals.

A case study of Fisher Foods Company as illustrated by Robert for example provides an illustration of the basis of strategy in operations. The firm that supply food product has identifies that it receives high demand for its products towards the Christmas season. Its strategy therefore involves measures to adjust to the increasing demand for its products during the season.

In the organization's strategy, it resorts to "make changes in the type of services provided, work flows, capacity and flexibility, human resource levels, suppliers commitments" among others (Lowson 54). Strategies therefore provides for the identification of steps that needs to be taken by the management and the implementation of such steps to the attainment of the objectives and functions of operations management (Lowson 42).

Following the objective of operations management to meet customer's expectations, improvements in the relationship between organization and the customers forms a part of the management's strategies. Improvement in the way in which customers are attended to is normally prioritized by the management. With this respect, strategies are laid to ensure that customers are attended to in the shortest duration of time possible and that such responses to customer needs are availed on demand.

Strategies with respect to customer relation also include improved accessibility to products and services to customers and enhanced range of productions to meet

diversified needs of consumers. Operations management also outlines strategies for controlling production costs of its processes which is made through provisions for the production chain. Provisions for appropriate designs that can help in reducing the costs are also considered.

Provision for improvement of quality of processes and products are also made under outlined strategies of the management with considerations regarding the quality of human resource, available technology among other factors (Chary 6).

Strategies can again be based on technological advancements with the aim of changing quality or quantity of productions. Improving technology can for instance be aimed at reducing costs of production and increasing reliability in production. Strategies can also be applied to production processes and programs as well as the management of human resource. The active role of the operations management then looks into the implementation and control of the laid down strategy through administrative procedures (Eng 16).

Objectives of Operations Management

It has been established that operations management is charged with specific duties in an organization that relates to the production of goods and services. In pursuit of successful accomplishment of such functions, operations management generally has specified objectives in their line of duty.

The objectives can be classified into two categories, “customer service and resource utilization” (Kumar 11). In line with each and every organization’s drive which is revenues which then translates to profits, focus is attracted to customer satisfaction through the operations management that is responsible for the production and delivery of customer’s needs.

The satisfaction of customers can be realized from two perspectives: costs of the good or service offered to the customer and the delivery of such products in time as demanded for by the customers. In the bid to fulfill customers’ needs in relation to these two aspects, operations management lays down objectives in each and every functional department that handles inventory. One of the critical sectors for aligning the objective is the manufacturing department.

The management must take measures to ensure particular brands of goods and services as projected to be demanded by customers are in the end provided. The objectives into what is to be produced then guide the manufacturing section on the type and quantity of goods or service to be offered. Objectives also outline timing for such activities in order to ensure a smooth manufacturing process and the final delivery.

Operations management will also seek to establish outline for its transportation schedules with specification to times and durations of transporting commodities. The need to avail provisions to their destination at the right time and at a checked cost thus ensures an established degree plans for accomplishments. The final supply of commodities and services offered to customers are also established elements that forms essentials of the operations management's objectives which are set to keep the customer satisfied (Kumar 12).

Apart from the significance of the level of revenues to the profit made by an organization, production cost is also a significant factor in the determination of profit levels of the overall activities of an organization. It is thus prudent that an organization outlines its targets with respect to its resource utilization.

Objectives are then made and pursued on how best customers can be kept satisfied with the organization's products and at the same time, resources into productions are organized at cost that are reduced to minimum possible levels. Operations management thus sets objectives on how to achieve "maximum effect from resources or minimize their loss, under utilization or waste" (Kumar 12).

With the dual purpose of ensuring customer satisfaction and reducing the costs incurred in resources, the central goal of the operations management thus remains to be the balancing of the two concepts, customer satisfaction and costs in resources, in order to satisfy the interest of both its organization in terms of profitability and that of customers in terms of timely and cost friendly deliveries (Kumar 13).

Operations Performance

Once objectives have been set into the balance between investments into customer satisfaction and the need to generate profits from operations, steps must be taken to ensure that the objectives are attained through thorough planning and implementation.

The performance of operations activities with respect to levels of efficiencies pays a key role in balancing the customer satisfaction- profitability equation. The demand for better service by customers that has been triggered by developments in technology and increased range of products in markets has also pushed for the need for every organization to focus on its performance in order to strike a balance in the equation.

Performance in operations activities has also been established to be a measurement to competence. Developments in market systems have transformed operations from being dependent on the supply chain into being the driver of the supply chain. As a result, operations and its managements has

become the backbone of organizations and its performance is significantly reflected in final reports of organizations such as turn over ratios and profitability measures.

Approaches to levels and types of technologies being used by an organization, the quality of human resource employed and the values attributed to the networks that the organization involves in are key determinants in the performance of operations activities. The need to establish performance level in operation processes also calls for measures to ensure that assets are efficiently "exploited, defended and developed" (Bettley, Mayle and Tantoush 1).

According to David Barnes, indicators of operations performance include "cost, quality, speed, dependability and flexibility" (Barnes 24). The performance of operations management for example is determined by its ability to produce and deliver its products at low costs.

Good managements will be expected to balance their combination of resources and activities in a way that the production will be realized at it lowest possible cost. At the same time, a good management is supposed to be able to produce goods that meet the required quality. The products should be in accordance with the purpose for which they are demanded, desired utility level and free from defects.

Efficiently organized operations processes will ensure that these aspects are met in its production. Operations performance is also determined by the speed at which operations can be undertaken. Ability to undertake faster production processes to meet quick demands by customers while at the same time maintaining the quality of the product is another measure of performance. This creates good relations with customers resulting in a positive image in regard to the performance of an organization.

Being reliable in meeting the needs of customers together with flexibility that exhibits ability to create new products, to produce a variety of products and services as well as "volume of production and time taken to produce" (Barnes 24) reflects on the performance of a management. A commendable performance will blend the conflicting objectives of customer satisfaction and resource control to drive an organization into improved productivity and profitability levels (Barnes 24).

Operations Management in Oil and Gas Industry

In the supply chain of oil and gas for example, the operations activities starts with explorations for availability of the petroleum resources by experts. The experts

such as “geological and geophysical” technicians conduct research into the availability of the resources (Carmichael and Rosenfield 21).

Steps such as acquisition of resources and contractors into the drilling process then follow which may depend on factors such as the depth of the resources. When sufficient resources are identified such as crude oil or natural gas, developments for the drilling mechanism is finalized and equipments put in place for the extraction of the resources. Market for the extracted minerals is then established before or in the process of extraction of the resource.

The whole process is however characterized by extensive monitoring and evaluation processes that start right at the exploration process all through to the point of sale of the crude oil or gas. The operations processes in the supply chain of oil and gas faces a lot of factors that calls for the application of the management to create a balance between consumer satisfaction in terms of pricing and organization’s profitability in the long run.

One of the factors that faces and calls for measures from operations management in the oil and gas industry is the uncertainty in the success of finding oil reservoirs in the drilling process as well as the long term sustainability of the resource. Taxation by authorities over the extracted oil and gas also plays a role in the operations process.

The timing of production as well “acreage and drilling costs” that falls under considerations of functions of operations managers are also critical in the production of oil and gas (Carmichael and Rosenfield xxx). The supply chain of oil and gas actually rely on the operations management’s undertakings such as “planning, estimating, modelling, organising and controlling resources and schedules with a view to optimising Project performance and quality” (Energy 1).

Advantages and Disadvantages of Operations Management

Operations management derives a lot of benefits to an organization through the application of the functions of operation managers. One of the advantages of the management is the resultant “effective utilization of scarce human and material resource” by an entity which enhances attainment of the institution’s objectives. Such effective applications results in relatively reduced production costs and subsequent profitability ratios.

The management also helps in ensuring that work in progress as held by its institution is controlled at low levels to reduce costs of storage of such materials or products. Another advantage of the management is the ensured satisfaction of customer’s needs that is also a marketing strategy to the parent organization (Lowa 1).

The major down fall of operations management is the conflicting interest that is imposed by the various functions of the management. As the management strives to satisfy the needs of its consumers through ensured quality and timely deliveries, there is the need to minimize cost in order to meet the organization's need for profitability (Barmford and Forrester 5).