1. Scientific Management [Frederick Winslow Taylor]

F. W. Taylor was born in 1856 in Philadelphia, USA. Taylor joined the Midvale Steel Works as an apprentice in 1978 and rose to a chief engineer in 1984. In 1998, he joined at Bethlehem Steel Company as a consultant engineer to management where he tested his ideas and found that there was increased efficiency. Taylor, an engineer by training and profession, is regarded as the father of scientific management. He did not attempt to study any specific organization rather concentrated on the intensive analysis of work processes at the level of individual workers. Based on his experiences and experiments, he developed fundamental principles of scientific management. Thus, scientific management theory is a management approach, formulated by F.W. Taylor that sought to determine scientifically the best methods for performing any task and for selecting, training and motivating workers.

**Background:** The first coherent administrative theory known as 'Scientific Management' was propounded in the beginning of the twentieth century. Among the scholars, the contribution of F.W. Taylor is most important in the development of the theory of scientific management. So he is regarded as the 'father of scientific management' school. Taylor observed that the conditions in factories were unplanned, there was absence of standardization of methods of work, there was no rational method of assigning workers to their jobs and they were often placed in jobs that they preferred. The work to be done and the methods to be adopted and selection of tools were also determined by workers. He also realized that there was a lot of waste of materials, loss of production and efficiency; there was no coordination between departments and managers did not possess decision making skills, they had no clear idea of the responsibilities. Decisions and standards of work performance were made on the basis of 'rule of thumb' that provided the workers with an opportunity for a 'systematic soldering' as well as the purposeful restriction of output.

**Scientific Management:** Based on these observations, Taylor developed a science of management/ a scientific theory of management aimed at discovering the 'one best way' of performing any task as well as increasing productivity. Taylor's work, *The Principles of Scientific Management*—1911, revolutionized the idea of optimizing
productivity. His notion of *scientific management* focused on the most efficient way of managing and making the workers more productive. It offered a systematic approach that managers could apply to their own organization.

Taylor proceeded to work on the basis of following four principles which are also regarded as the hallmark of the scientific management school.

1. *The development of a true science of management*: The first principle was finding the *best way of doing a job* so that the best method for performing each task could be determined. The most efficient ways of completing tasks and standard work procedures were believed to enhance productivity. Taylor introduced/implemented the time and motion studies at Midvale Steel Works to determine the highest level of output in accordance with a particular procedure. By doing so, Taylor was able to find the 'one best way' of doing a job.

2. *The scientific selection of workers*: It involved the scientific selection and progressive development of the workers so that each worker would be assigned responsibility for the task for which he/she was best suited. By introducing this principle, it was expected that management can better identify the inherent strengths and weaknesses of each worker which, in turn, help management to maximize his/her capacities.

3. *Bringing science of work and the scientifically selected workers together*: The third principle was fusing the science of doing the job with the scientifically selected workers. Taylor emphasized that unless the science of doing work and the workers are brought together, all efforts will be lost. According to him, the success of scientific management depends on the fusion of work procedures and workers and it is the most important responsibility of management.

4. *Equal division of work and responsibility between management and workers*: He stressed that equal division of responsibility would ultimately promote intimate and friendly cooperation between management and workers which, in turn, would help
management for better supervision of its workers as well as reduction of disputes between them.

In a nutshell, productivity and efficiency were the primary ends of scientific management. Standard work procedures, scientific selection of workers, fusing together the science of work and trained workers and sharing of responsibility between management and workers were the means to achieve those ends. Scientific Management is a combination of all these principles and these principles cannot be isolated.

**Basic components of scientific management**

There were four important components of scientific management.

a. *Determination of standards of performance*: The real problem that Taylor found from his experience was that no one exactly knew how much work a worker was expected to do in a specific/given time. The standards of work performance were determined on the basis of *rule of thumb* rather than *following* any scientific basis. Taylor introduced his famous *time and motion study*\(^1\) to determine the standard of work performance.

b. *Functional foremanship/functional organization*: Taylor called for a drastic reorganization of supervision and recommended functional foremanship in the organization in which the worker receives orders from eight functional specialists. In other words, he proposed using specialized experts known as functional foreman each of whom was responsible for some specific aspect of the worker's task. He also advocated the division of work between managers and workers favoring a complete separation of the planning function from the doing function. [He opposed the linear system or military type of organization in which each worker is subordinate to only one boss]

\(^1\) Time study is an act of observing and recording the time required to do a particular work. Motion study involves the study of the movement of a worker to eliminate unnecessary motions and to determine the best method of doing a work.
c. **Piecework system of wage payment:** Taylor observed that workers did as little as possible because under prevalent system of wage payment, a worker who had nothing to gain if he/she worked hard. To deal with this problem, he developed the system of 'differential piecework' for motivating them to achieve the highest level of efficiency.

d. **Mental revolution:** Scientific management, in its essence, according to Taylor involves a complete mental revolution in the attitudes of workers toward their work and in the attitudes of managers/management toward their duties and the ways in which they handle their daily problems. According to him, determining standards of work, eliminating wasteful operation and piecework system of wage payment would benefit both the workers and the employer/management which would result into a mental revolution among the workers and the management since they would develop a cooperative attitude toward each other.

According to Taylor, MENTAL REVOLUTION is the essence of scientific management. Without complete mental revolution on both sides, scientific management does not exist.

**Contribution**

Taylor's ideas of scientific management and his concepts about management of resources, workers and workplace were revolutionary in his time. Its principles became widely accepted in the private sector and the idea of finding the *one best way* of doing the job appeared as the standard for achieving efficiency. Its ideas largely influenced administrative thought and management practices over time. The scientific management also attracted the support of governmental administrators who were directly concerned with the question of efficiency. The general principles of standards of work, functional organization, selecting and placing the right person for the right job are still being used widely in both private and public administration.

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2 Under this system, a worker received the piece rate for his work/ production if his/her was below the predetermined standard and a higher rate for their entire work if he/she met the standard or above it.