

Scientific Management; Concept, Principles, And Relevance

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Abstract: To replace traditional approach, at the turn of the twentieth century, the first ever-serious effort was made by Frederick Taylor by putting forth scientific management theory. It brought a revolution by introducing scientific aspects of industrial operations and patterns. While Emphasising on profit maximisation scientific management, aimed at motivating employers and employees and at the same time, increasing production and lowering cost per unit production. However, it has been scrutinised and criticised Severally for treating workers as machines which, eventually, resulted in negative performance in the long run. This paper studies the principles, techniques, and methodologies of scientific management and its utility in the contemporary times

Key words: Taylorism, Scientific management, quality management, relevance.

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I. Introduction

Scientific Management Approach is one of the important approaches in the field of Administrative Theory. This Theory came in the wake of new industrial revolution that has taken place during the later part of the nineteenth century. This approach is an attempt to solve problems of complex organisations that have emerged as a result of industrial development. F W Taylor (1856-1915) is regarded as the father of scientific management and was one of the first management consultants. A pioneer of the modern management approaches and techniques, Taylor believed that the “best management is a true science,” applicable to all social activities, including, management of homes, farms, churches, philanthropic institutions, universities and Govt departments.

During the later part of 19th century a new industrial climate began to descend upon American business. The practices of management began to change from a day-to-day problem solving approach to a more all-inclusive, comprehensive, long-term approach to grapple with the emerging managerial problems, Which were not faced previously. Taylor’s contribution to the development of scientific management was recorded in his papers A Piece Rate System (1895); Shop Management (1903); The Art of Cutting Metals (1906) and The Principles of Scientific Management (1911).

Taylor’s first paper, apiece -Rate System was considered as an outstanding contribution to the principles of wage administration. A new system comprising of three parts was proposed by Taylor including, (a) Observation and analysis of work through time study to set the ‘rate’(b) A ‘differential rate’ system of piece work, and (c) ‘paying to men and not positions’. In his 2nd paper, “shop management “, he focussed on philosophy of management whose objectives include:

- Application of scientific methods of research and experiments to the management problems;
- Standardisation of working conditions and place the workers on the basis of scientific criteria;
- Giving formal training to workers and specific instructions to perform the prescribed motions with standardised tools and materials ; and
- Ensuring friendly cooperation between workers and the management.

His stay at Midvale Steel Company and close observational study of different operations in different factories, made him identify defects of management. They are: Lack of clarity of responsibilities by workers and management, Lack of Standards of work , restricted output because of Soldering of work , Lack of job clarity which promotes soldering of work ,Lack of scientific base for decisions , Lack of division of work, and placement of workers at different jobs without considering their ability, skills, aptitude and interest. He advised that management should take the responsibility for determining standards, planning work, organising, controlling and devising incentive schemes. To overcome the deficiencies in the management, Taylor, formulated four new principles known as principles of scientific management as.

1. Development of a true science of work; there is one “best way” of doing every job which, can be achieved by systematic study of any work and replacing old rule of thumb method by developing a scientific method.

2. Scientific selection and progressive development of workmen; it involves selecting a right person for a right job. It is incumbent upon management to study the character, nature and performance of each worker with a view to find out their limitations and possibilities for improvement and development.
3. Bringing together of science of work and scientifically selected workers; Taylor observed that “unless the science of work and scientifically selected men are brought together all work will be lost”. He believed that workers are always willing to cooperate with the management but there is more opposition from the side of management.
4. Division of work and responsibility between worker and Management; He emphasised on equal responsibility between worker and management. It will result in mutual dependence and cooperation and elimination of conflict and discord.

It is a combination of all these principles that constitute scientific management, which primarily involves a complete mental revolution on the part of the workers and the management as to their duties, towards their work, towards their fellow workers, and towards all their daily problems. With this revolution in the mental attitudes of the two sides, the two sides stop pulling against each other, and instead both turn and push shoulder to shoulder in the same direction till the size of the surplus created by their joint effort is truly astounding.

Being critical of military type or linear system of organisation in which, each worker is subordinate to only one boss, he replaced it with what is called “functional foremanship”. Here a worker receives orders from eight specialised supervisors of whom, four are responsible for planning and remaining four for execution. In this functional type of organisation, foreman can be trained easily and specialisation becomes very easy. In addition to functional foremanship, the other mechanisms to operate principles of scientific management include:

- Time study; with the implements and methods for properly making it.
- Standardisation of all tools and implements.
- Acts or movements of workmen for each class of work.
- The desirability of a planning room or department.
- The ‘exception principle’ in management.
- Use of slide-rules and similar time saving implements.
- Instruction cards for workmen.
- The task idea in management, accompanied by a large bonus for the successful performance of the task.
- The ‘differential rate’ system.
- Mnemonic system for classifying manufactured products as well as implements used in manufacturing.
- A routing system.
- Modern cost system.

II. Relevance

The manifestation of F.W. Taylor’s theory of scientific management was a major breakthrough in traditional approach to management process. Simultaneously as management evolved gradually, Taylor’s theory was severely criticised and its role declined dramatically to the extent that nowadays it is argued whether Scientific Management still exists ?

It is not hard to find examples of scientific management in today’s world; we can see the car industry, manufacturing plants, even some hospitals function efficiently due to application of scientific management. Taylor’s “time and motion study” is still widely used by managers today, which is evident in McDonald’s who use one standardised process e.g. to make a burger, which workers have to follow. This standardised process & the other principles of scientific management put together have evidently proved to be the best way to reach their ultimate productivity (world’s leading fast food chain). Though managers will have their own unique style of management, however, every manager has to use strategies which are compatible with the organisation’s nature and culture of Work. Many organisations like “Google” and many charitable organisations are not using Taylor’s model because it might not suit the nature of work of these organisations. However, during a time of emergency, such organisations may apply ‘best method’ devised by Taylor. It is apt to mention that scientific management is very much a part of every organisation in 21st century. Its strengths in creating a divide between management functions and work functions have been employed widely at all levels in industries. Additionally, its attempt in making organisations efficient by replacing “rule of thumb” with scientific method has ensured its widespread application.

Development of ‘offshore markets’ is one of the most significant developments that scientific management has produced in the 21st century. As a result of its rigorous analysis of labour techniques, many functions that were accompanied in the USA, are now performed overseas because of low labour costs and much lower taxes in countries like India, China, Korea and other countries.

Total Quality, is a direct result of scientific management. Many principles of quality improvement & the Six Sigma method of quality management, trace their origins to scientific management. The philosophies of continuous improvement, constantly seeking better ways to improve quality, are also directly related to scientific management. Japanese management, which, led to the quality movement, traces many of its principles to scientific management. The automotive industry and the military have also greatly improved the quality of their services by stressing quality improvement techniques.

It would be correct to say that scientific management theory in its pure form might not be visible, however, its elements are deeply ingrained in all modern organisations mixed and matched with other theories.

III. Conclusion

Scientific management eventually resulted to evolve modern management. Taylor introduced science of problem solving in productivity maximisation. This drift from an ancient, rigid and ad-hoc system has gradually, been modified by involving Industrial psychology and Behavioural sciences. It paved the way to evolve contemporary management and performance measurement research. While retaining core concepts of scientific management, the contemporary high performance management system, reduces employee-ownership status distinctions and prioritises the employee initiatives, feedbacks to make them feel valuable and committed. Taylorism, has provided new insights into modern day project management of the booming era of science and technology helping, the individual within any organisation and rank to realise that, the implications of human factor and its contribution together with systematic execution of processes is inevitable for output maximisation.

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