

Course M.Com Part I

Paper I

Topic: Scientific Management

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## **Scientific Management – Meaning and Scope**

Broadly speaking, scientific management is the art of knowing exactly what is to be done and the best way of doing it. Under this system the method of work is scientifically thought out, the workers scientifically selected and trained to perform the task, and the most efficient speed is scientifically determined.

According to Person the term “scientific management” characterises that form of organisation and procedure which rests on principles or laws derived by the process of scientific investigation and analysis, instead of on tradition or policies determined by the process of trial and error. Indeed, it is a process of transference of skill from management to worker.

Scientific management is also known as Taylorism, because Frederic Winslow Taylor, who is also known as the father of scientific management, was the first to introduce scientific method at the workshop level. As the Chief Engineer in a steel mill, Taylor noticed wastage of time and energy on the part of workers.

He found that workers were deliberately slack in performing their work. Time-rate, being the basis of wage- payment, was not conducive to hard work. He was amazed at the employers who paid no attention to this wastage. The methods used for performing the task were crude and unscientific so that a worker could not produce to the maximum of his capacity.

Taylor and other pioneers came to the conclusion that, in comparison to what was possible with scientific control, the industries were working at about 50 per cent efficiency. Taylor demonstrated that proper method of work produced good results, and locating the proper method involved scientific investigation. Every employer should by scientific investigation, develop the best method of work and then teach it to workers who must follow it.

**The two chief points in connection with Scientific Management made by Taylor have been:**

1. Complete cooperation between employers and workers, or mental revolution, and
2. Scientific Investigation as the basis of all decisions.

**1. Mental Revolution:**

In the words of Taylor, “scientific management involves a complete mental revolution on the part of workers and management and without this complete mental revolution on both sides, scientific management does not exist”. Both sides must aim for cooperation for maximising output and give up hostility and suspicion. Both sides should take their eyes off the division of the surplus as the all-important matter and together turn their attention toward increasing the size of the surplus.

Usually the workers try to keep output low for fear of creating unemployment. Again, due to payment on time basis, extra output or increased efficiency does not benefit the worker. Employers also do not take kindly to increase in workers’ earnings. The net effect is mutual hostility and suspicion resulting in low profits and lower wages. Workers should realise that good work brings down cost and pulls up profits with a consequent rise in wages.

The employers should also recognise that if output goes up cost comes down, increased wages will still leave higher profits for them. Therefore, workers should welcome efforts to increase

output and cooperate with the employers; employers should readily raise wages. Both must recognise that prosperity of both depends upon the prosperity of each and none should attempt to prosper at the cost of the other. Taylor never introduced scientific management without raising wages, for it is futile to expect workers' cooperation without material benefit to them.

## **2. Scientific Investigation:**

A management determined to make scientific management a success must make scientific investigation as its basis. It is necessary to investigate scientifically all factors relating to work and then perform the work according to the results indicated. The traditional rule-of-thumb method, that is decisions based upon the whims of the managers, must be given up.

Nobody should decide anything unless all the relevant information is collected and until experiments have been carried out to test the proposed line of action. The following sections deal with the various aspects of scientific investigation.

### **The important Features of scientific management are as follows:**

#### **Feature # 1. Scientific Task-Setting:**

Scientific management determines the task for every worker through careful scientific investigation. The standard task is the quality of work which an average worker working under ideal standardised conditions will be able to do in a day. This was called 'a fair day's work.'

Thus, Taylor stressed upon standardisation and pre-planning.

#### **Feature # 2. Planning:**

Planning as Taylor says – "is the heart of scientific management". This planning was concerned with four things; what work has to be done, how it is to be done, where the work shall be done, when it will be done. The first question was to be dealt with by the management and the engineering department.

Taylor advocated the setting up of a planning department. This department will receive detailed instructions and formations relating to the type, shape and quality of production to be produced and the dead line by which the production is to be completed. In planning department four persons were to work – (i) Programme clerk (ii) Instruction clerk, (iii) Time and cost clerk and (iv) a disciplinarian.

### **Feature # 3. Working Study:**

It may be defined as the systematic, objective and critical examination of all the factor's governing the operational efficiency of any specific activity. In work study Taylor stressed on method study, time study, fatigue study and scientific rate setting.

#### **(a) Methods Study:**

Under this study, the management must make an overall study of the entire production process. Then the management should made efforts to reduce this distance to be travelled by materials during productive cycle.

On his basis a “process chart” setting out the various operations may be prepared. With the help of such study, the management can try to ensure that the plant is laid out in the best manner and is equipped with the best tools and machinery.

#### **(b) Motion Study:**

It is a study of the movements of-an operator or a machine in performing an operating for the purpose of eliminating useless motions. For conduction motion studies, workers are studied at their jobs and all their movements are noted. Then they are analysed and useless motions are eliminated. Thus a less time consuming and efficient system of operation is developed.

#### **(c) Time Study:**

The purpose of time study is to determine the proper standard time for performing the operation. In the words of Kimball and Kimball “Time study may be defined primarily as the art of observing and recording the time required to do each detailed element of an industrial operation”.

Time study when done with motion study helps in determining the best method of doing a job, determining the standard quality of one day’s work (standard) task to be done by an average worker) and in rating the work.

#### **Feature # 4. Scientific Selection and Training of Workers:**

Taylor stressed on the systematisation of selection according to the nature of requirement of job. Having selected the workers the management will assign tasks to them. Every job must be entrusted to the best available man in the factory. Proper attention should be devoted to the training of workers in the correct methods of work. The scientific management requires the prior training of workers before allotting them certain task in the plant.

#### **Feature # 5. Standardisation:**

Taylor suggested the standardisation of not only production but of tools too. Equipment’s and of working conditions also. He insisted upon the use and store of standard tools and equipment’s in order to get the best production. He advised the management to set an optimum speed for every machine and one best way to do each job.

To attain the standard production, he insisted upon the maintenance of standard conditions of ventilation, heating, cooling, humidity, space and safety etc. The use of high quality raw material and good methods of handling materials were also stressed upon.

#### **Feature # 6. Differential Piece-Rate System of Wages:**

Taylor believed that financial incentive is the most appropriate incentive because man works for money. To ensure the efficiency and speed of works he suggested the system of differential piece-rate wages. According to this system two piece-rate should be determined; one for standard production and the other for lower production than the standard limits. It was believed that each worker will try to raise his efficiency in order to get the wages of higher rates.

**Feature # 7. Functional Organisation and Functional Foremanship:**

Taylor suggested the scheme of Functional Foremanship. Under the scheme, the two functions of ‘planning’ and ‘doing’ are separated in the organisation of the plant. Four foremen will look after the planning work and the other four will supervise the work in the shop. Taylor contemplated eight functional foremanship.

**Feature # 8. The Mental Revolution:**

This involves the change of attitude on both sides. Under this Taylor suggested that all the measures outlined in the system of scientific management will be fruitless until and unless there is a complete mental revolution on the part of both the management and the workers as to their outlook and attitude towards work and towards one another. Taylor has written that the methods of scientific investigations and knowledge must be accepted by both the parties without any reservation on their part.

To conclude – Taylor has suggested that “the success of scientific management rests primarily on a fundamental change in the attitude of management and workers both, also their duty to co-operative in producing the largest possible surplus and as to the necessity of substituting exact scientific knowledge for opinions or the role of thumb of individual knowledge”.

**Scientific Management – Techniques**

1. Time study to determine a fair day's work.
2. Motion study and micromotion study to eliminate wasteful motions.
3. Functional Foremanship consisting of the use of 8 staff specialists – 4 each in the factory office and the shop.
4. The Differential Piece Rate Plan of wage payment involving two different rate of wages for efficient and inefficient workers.
5. Standardisation of tools, equipment and working conditions.
6. Instruction cards, slide rules, graphs, charts, costing systems etc.