

ROLE OF SCIENTIFIC MANAGEMENT AT WORK PLACE: Perceptions and Misperceptions

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Introduction

The Principles of Scientific Management are an ever living monograph which has been at the center of the focus of students and scholars of management sciences since it was published in 1911.¹ Under the management system, factories are managed through scientific methods rather than by use of the “rule of thumb” so widely prevalent in the days of the late nineteenth century. The proponent of the idea was Frederick Winslow Taylor—a mechanical engineer at Midvale Steel, Philadelphia, USA, who looked beyond the technical side of manufacturing and got to be known for economizing of efforts and raising the productivity at the work place. Owing to its path breaking significance the monograph has so far been translated into several languages to shape the managerial processes around the world in line with the drills and procedures designed in Taylorism. According to Hirschhorn, Taylor's work highlights the relationship between rationalization in general and labor-control methods in particular.²

There is no denying the fact that seeds of scientific management were grown with the Industrial Revolution. Introduction of steam power and the creation of large factories posed new challenges to organization and management that had not been confronted before. Administering

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these new factories busy in mass production, railroads managing large flows of material, people, and information over large distances called for a new science of management based on scientific techniques that could change the old rule of thumb. The initial stories of this new form of management introduces us about the management gurus like Daniel McCallum and Henry Towne³ who called for systemization and systematic management, however, Taylor was one of the first to attempt to systematically analyze human behavior at work. Therefore, the title of “The Father of Scientific Management” is rightly reserved for FW Tyler and the approach is also often referred to as Taylorism. Taylor attempted to make individuals equivalent of machine parts: no resentment, passive, easily interchangeable, cheap, and emotion free. Hughes has rightly pointed out that the underlining idea and the fundamental principle of the scientific management was to design a production system that would involve both men and machines and that would be as efficient as a well-designed, well-oiled machine.⁴

The Main Theme:

The monograph elaborates the main theme of the idea and its nitty gritty requisites in its well composed three parts as follow:

The part one introduces the book and presents the arguments to build on the concept of Scientific Management. Taylor tried to convince the reader that the whole of the United States of America is suffering from inefficiency in almost all of daily acts of Americans which can only be remedied by systematic management. He moves on to prove that the management is a true science, that must be regulated through well

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defined principles, rules, regulations, drills and procedures and whenever these principles are appropriately applied, the results are forthcoming.

The part two (Chapter-one) discusses the Fundamentals of Scientific Management that must aim to ensure maximum prosperity for both the employer, and the employee. However, he believes that prosperity is subject to the maximum productivity which, in turn, is dependent upon the training and development of each individual in the establishment. Taylor diagnoses two main reasons for the inefficiency, that is:

- He described "soldiering" the act of 'loafing' both at an individual level and "systematic soldiering" as one of the main reasons that workers were not performing their work at the optimum. Soldiering was mainly based on the misperception that a material increase in the output of each man or each machine in the trade would result in the end in throwing a large number of men out of work. The factors leading to soldiering are: ⁵ the belief that increased output would lead to less workers, incentive schemes and hourly pay rates not linked to productivity, performance of the work by rule-of-thumb.
- The inefficient rule of thumb methods that caused the workmen waste a large part of their effort were almost universal in those days. Taylor argued that the substitution of the scientific for the rule of thumb methods would be beneficial both for the employers and the employees.

The part three of the book (chapter-two) elaborates the elements and the Principles of Scientific Management. Tylor emphasized that in best

form of management labour is defined and authority/responsibility is legitimised, selection is based upon technical competence, training or experience, actions and decisions are recorded to allow continuity and memory, and management is considered to be different from ownership of the organization. The main elements of the Scientific Management include: Time studies, functional or specialized supervision, standardization of tools, separate Planning function, use of slide-rules and similar time-saving devices, instruction cards for workmen Task allocation and large bonus for successful performance, use of 'differential rate' etc.⁶ The four principles of Scientific Management which Taylor emphasized were:

- Replace rule of thumb work methods with methods based on a scientific study of the tasks.⁷
- Scientifically select, train, teach, and develop each worker rather than leaving them to train themselves.
- Provide detailed instruction to and supervision of each worker in the performance of his assigned task.
- Divide work nearly equally between managers and workers, so that the managers apply scientific management principles to planning the work and the workers actually perform the tasks.

Analysis

Though the idea of Scientific Management was contemporary to Henry Fayol's Administrative Theory and Herbert Simon's Bureaucracy, but none could match the influence it could generate especially in private / for profit organization and even in military it became the basis of

decision theory and tool to sharpen administrators and managerial techniques. The concept gave a new drive to managerial pursuit of searching for efficiency and systemization. It advocated breaking down of each task to its smallest unit, finding the one best way to do each job by eliminating those motions not essential to the task. It also evolved a separation of planning from operations. This new method of management was acknowledged with rising productivity, reducing operation cost and introduction of new echelons / departments specialized in dealing with quality control and personnel recruitment and training tucked in the ladder of organizational hierarchy. However, this was not at all a happy journey rather an uphill struggle with numerous obstructions and resistance that some considered the "dehumanization of work." Lasch quotes Taylor himself writing that, his attempt to redesign the work process "immediately started a war...which as time went on grew more and more bitter"⁸ It was found very difficult to believe that management was a science to be studied not something one was born with. "Worker soldiering"⁹ also resisted Taylor's pursuit to his goal. Taylor spent a considerable time in describing "soldiering", the act of 'loafing' both at an individual level and "systematic soldiering". Taylor believed that the objective of workers when stalled was to keep "their employers ignorant of how fast work can be done" ¹⁰ He described main reasons of the soldiering that workers were not performing their work at their optimum level as:

- The belief that increased output would lead to firing and de-hiring of workers resulting into fewer workers at work place.
- He believed that equity at work place doesn't exist as the management control system such as poorly designed incentive schemes and hourly pay rates were not linked to

productivity. Every worker irrespective of his out put or individual hard work was paid on equal term. Taylor spent a considerable time in describing "soldiering", the act of 'loafing' both at an individual level and "systematic soldiering".

- Science was not being used to design new method of work process and culture of encouraging worker's initiative was non-existing. Rather the only design of the performance of the work was by using old rule-of-thumb.
- He strongly advocated for the worker training and development to transform and enhance his workability through skills development. He believed that training and development of each at the work place would enable the worker to work at his fastest pace and with the maximum of efficiency.

He was of the opinion that future work environment would no longer tolerate the type of employer who only cares for dividends alone, and who drives for harder work and labour for low pay rate.¹¹

It is a proven fact that Scientific Management did improve the productivity manifold and substantial impact on the industry and industrial engineering, however, the concept has number of drawbacks:

- The core job dimensions like skill variety, meaningful task identity, autonomy and feed back were the most serious missing links in the concept.
- It did not cater for the "individuality"- most important aspect of the human behavior by ignoring individual differences and treating their work similar to machines pattern. It forgets to

realize that the most efficient way of working for one person may be inefficient for another.

- The main criticism against Taylor is that his approach has dehumanized the work place. Specifying not only what is to be done but how it is to be done and the exact time allowed for doing it, is seen as leaving no scope for the individual worker to excel or put his own mind & soul into work. The element of time and motion study introduced to maximize efficiency and productivity by removing unnecessary or wasted effort. Little heed was paid to the potential influence or importance of human factors upon work performance.¹² It ignored that workers are essentially human: personal needs, interpersonal difficulties, and the very real difficulties introduced by making jobs so efficient that workers have no time to relax. As a result, workers worked harder, but became dissatisfied with the automated work environment.

Contributions

1. Organizational Theory:

Though most of the principles of the organization theory are attributed to Henry Fayol, however, Taylor also synthesizes the framework of organization by introducing many new principles and conforming others:

- Clear delineation of authority
- Allocating responsibility to each
- Separation of planning from operation
- Recruiting and placing right person at right job.
- Incentive scheme to ensure motivation at workplace
- Task specialization

2. Mother of New Managerial Concepts:

During the last 100 years or so the concept of Scientific Management has not only perfected its drills and principles but has also contributed in developing new trends in practices in managerial functions. Some of the examples in this regard are:

- Since it was the Scientific management which firstly attempted to treat management and process improvement as a scientific problem therefore, with the advancement of statistical methods, the approach was improved and referred to as quality control in early thirties, in 1950s it evolved into Operations Research. Today TQM (total quality management), reengineering, Six Sigma and Lean manufacturing could be seen as extensions of scientific management.
- Underlying ideas which have been main focus of the Scientific Management are better suited to fit in the science and methodology of TQM, those may be summarized as:
 - i. Developing Science for doing each work, and not rule of thumb
 - ii. Selection of right people for right task. Training and development of workforces brings each man to his greatest of potential to deliver.
 - iii. Create harmony at the work place and shun discord
 - iv. Promote cooperation and team work, rather than individualism
 - v. Quality / standard products enhances customer base that in turn lead to maximization of output / economy of scale thereby reducing overall cost of production.

- Since the aim of scientific management is to produce knowledge about how to improve work processes therefore, Peter Drucker sees Taylor as the creator of knowledge management.
- Scientific management has had an important influence in sports, where stop watches and motion studies rule the day.
- Today almost all of the armies of the world are employing principles of Scientific Management in their daily drills and practices. All the key ideas initiated by the Scientific Management like; selection of workforce appropriate abilities required for profession of arm, training for the task to be performed, job description, reconnaissance and planning of work, conducting exercises / rehearsals to eliminate interruptions and achieve zero-error syndrome at the of operation.
- Dehumanization of work place through time And motion study the 'scientific approach' gave birth to the human relations movement, the first management approach that "tried to understand and explain how human psychological and social processes interact with the formal aspects of the work situation to influence (worker) performance"¹³

3. Evolving Nature of Industry:

Scientific Management's concepts of work design and measurement, production control, scientifically selection of people and training of workforce has completely evolved the nature and structure of industrial setting and introduce new departments such as; quality control, personnel, training, and maintenance etc.

4. Protection of Worker Rights and Organization of Labour Unions:

The related literature testifies that the decade following the birth of Scientific Management can be marked with manifold increase in output. However, the workplace also had an anti-working class characters, workers were treated as machines, devalued, and paid less money for their efforts. This led to formal organization of labour union. Interestingly, later, the principles of scientific management like standard work design, working hours, training of workers, money bonus for increased output etc became the tools in the hands of labour unions to protecting jobs and worker rights at the workplace. As industrial unions took root across Europe and the USA, wage and job security provisions were established through collective bargaining by using sharply defined job tasks

Conclusion

Scientific management focuses on worker and machine relationships and advocates that increasing the efficiency of production processes can increase organizational productivity. The efficiency perspective is concerned with production that economizes on time, human energy, and other productive resources. Jobs are designed so that each worker has a specified, well-controlled task that can be performed as instructed. Specific procedures and methods for each job must be followed with no exceptions. Scientific Management had a major influence on the development of production management as a subject and brought a mental revolution by setting grounds for new ideas / managerial techniques like TQM, operation research, planning and supervision. The concept has introduced a new philosophy and methodology of work organization by promoting systematic time and motion study, developing new controlling techniques and measuring production, and introducing

reward/ incentive pay system for increase out put, at work place. It has not only affected the industrial work place environment rather its impact on contemporary society and its so called McDonaldization has been considerable.¹⁴It gave birth to a movement that unleashed a crusade world over against inefficiency in 1920s and thereafter. Its fruits have never been restricted to American Peninsula rather it has become a philosophy of management and administration at work around the globe.

End Notes

- ¹ Frederick W. Taylor, *The Principles of Scientific Management* (New York: Harper Bros., 1911) . On Line Version available at: <http://www.marxists.org/reference/subject/economics/taylor/principles/index.htm>
- ² Hirschhorn, L., *Beyond Mechanization: Work And Technology In A Post-Industrial Age*. (Cambridge, MA: MIT Press.1984)
- ³ Daniel A. Wren, *The History of Management Thought*, 5th, (Hoboken,,John Wiley & Sons,2005), p.121
- ⁴ Hughes, T.P., *American Genesis*. (New York: Penguin Books.1989)
- ⁵ Taylor, *Principles of Scientific Management*, opcit., Pg. 23. Also see: Vincenzo Sandrone, "F. W. Taylor & Scientific Management", Available at: <http://www.ar.com.au/~vince/>
- ⁶ Ibid; p 129-130
- ⁷ Taylor, *Scientific Management*, opcit, p.25.
- ⁸ Lasch, C. , "Technology And Its Critics, the Degradation Of The Practical Arts", *Technological change and the transformation of America* (Southern Illinois University Press. pp. 79-90).
- ⁹ Worker soldiering refers to the practice of purposely stalling or slowing down work by the workers.
- ¹⁰ Hughes, T.P., *American Genesis*, opcit. p. 190
- ¹¹ Taylor, *Principles of Scientific Management*, opcit, p.139
- ¹² Shaun Tyson, Alfred York, *Essentials of HRM*, 4th ed. (New Delhi, Butter worth Heinemann, 2000), p.12
- ¹³ Bateman, T.S. and Zeithaml, C.P. *Management: Function and Strategy*. (Homewood, Illinois: Irwin. 1990), p.53
- ¹⁴ Ritzer.G., *The McDonalozation of Society*, cited in : Macolam Warner, *Management Thinking*, ed. (Thomsons, London, 2000), p.659.

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