

Scientific Management

The Industrial Revolution that started with the development of steam powered engines and the creation of large factories in the late Eighteenth Century lead to great changes in the production of textiles and other products. The evolution of factories created tremendous challenges to organization and management that had not been confronted before. Managing these new factories and later new entities like railroads with the requirement of managing large flows of material, people, and information over large distances created the need for some methods for dealing with the new management issues.

The most notable of those who began to create a science of management was **Frederic Winslow Taylor**, (1856-1915). Frederick Taylor advanced one of the first concepts of management, dating back to the early 1900's. He was not the originator of many of the ideas he advanced, but had an ability to synthesize the work of others and promote them effectively to industrial managers eager to find a new way to work in these larger factories and businesses.

To define the term we look to it's roots. **Scientific** means conforming with the principles or methods used in science. **Management** (Root – French: “ménagement” - the art of conducting, directing; or Latin – “manum agere” meaning “lead by hand” – Common use - the act of managing something. Scientific Management can thus be defined as “the approach to organizational design and management using the principles and methods of science.”

He used the concept of a machine with its cheap, interchangeable parts, each of which does one specific function, as his model. Taylor attempted to do to these

new and complex organizations what engineers had done to machines and this involved making individuals into the equivalent of machine parts. Just as machine parts were easily interchangeable, cheap, and passive, so too should the human parts be the same in the Machine model of organizations.

As an example at Bethlehem Steel he was able to reduce the number of coal stokers in the furnaces from 500 to 140 simply by studying their work and experimenting with different shaped shovels and materials. He was able to design a new shovel that would enable workers to work all day.

Taylor's work established the bedrock for the concept of scientific management and was unique and groundbreaking for a number of reasons:

1. It applied a scientific approach to each element of job design using motion and time studies. It used a scientific methodology to performing tasks which could be repeated, tested, and retested.
2. It provided that workers would be selected and trained for the tasks that they would perform instead of self selection and on-the-job training.
3. It provided for standardization of tasks to maximize the effectiveness of production. This required a healthy dose of cooperation between managers and the workforce to ensure that procedures first led to effective production and then that workers followed those procedures.
4. It provides for an equitable division of labor for workers and managers for which they are best suited. The organizational chart and it's associated interrelationships are examples.

Facilitator's Body of Knowledge Research Project

Taylor attempted to make a science for each element of work and restrict behavioral alternatives facing worker. Taylor looked at interaction of human characteristics, social environment, task, and physical environment, capacity, speed, durability, and cost. The overall goal was to remove human variability. The results were profound. Productivity under Taylorism, another term used in place of Scientific Management, went up dramatically.

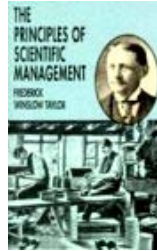
His impact is significant because it led to the concept of work design. New departments arose such as industrial engineering, human resources, maintenance, and quality control. There was also growth in middle management as there evolved a separation of planning from operations. Rational rules replaced trial and error; management became formalized and efficiency increased.

Of course, these successes did not come about without resistance. First the old line managers resisted the notion that management was a science to be studied not something one was born with (or inherited). Then of course, many workers resisted what some considered the "dehumanization of work." To be fair, Taylor also studied issues such as fatigue and safety and urged management to study the relationship between work breaks, and the length of the work day and productivity and convinced many companies that the careful introduction of breaks and a shorter day could increase productivity. Nevertheless, the industrial engineer with his stop watch and clipboard, standing over you measuring each little part of the job and one's movements became a hated figure and led to much sabotage and group resistance.

Application:

Scientific Management is an important concept for facilitators to understand. Much of the work that facilitators are engaged in, strategic planning, process management, process improvement, and reengineering have their roots in Scientific Management.

Resources:



The Principles of Scientific Management; F.W. Taylor (Reprint of papers) 1998 Harper & Brothers Publishers, NY (ISBN 0-486-29988-0)

Modern History

Sourcebook: Frederick W. Taylor: The Principles of Scientific Management, 1911

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http://www.engr.sjsu.edu/pabacker/scientific_mgt.htm

<http://faculty.ncwc.edu/toconnor/417/417lect03.htm>

Marxist.org:
<http://www.marxists.org/reference/subject/economics/taylor/principles/>