Taylorism & Neo-Taylorism

A Japanese Commentary on Taylor

"We will win, and you will lose.
You cannot do anything about it because your
failure is an internal disease.
Your companies are based on Taylor's principles.
Worse, your heads are Taylorized, too."

Konosuke Matsushita
Founder, Matsushita Electronics
1988

The term paradigm formerly meant simply an example or pattern (useful in the teaching of mathematics), but today it has come to mean more broadly, a system of rules and practices that allow people to function within that system. Paradigms tell us how to act to be successful within them, and what to expect from other people. A paradigm can be formal - as in the military system with its ranks, uniforms, and regulations; or a paradigm can be informal - as in the customs, dress, and communications by which business is generally conducted. In Western business, Taylorism and its modern manifestation neo-Taylorism are the dominant paradigm of management today. Thus, understanding Taylorism is essential if Deming's profound changes are to be appreciated and enacted.

Who was the man of whom Peter Drucker would say, "I do not think it extravagant to consider Frederick Taylor as the one relevant social philosopher of this, our industrial civilization"? What are Taylorism and neo-Taylorism, the systems based on Taylor's philosophy? Without the answers to these questions we are like fish who swim and live their lives in water yet don't know of water's existence. Please join us for a short, but vital, trip into the past.

Frederick Winstow Taylor (1856-1915) was an American engineer who formulated a theory of scientific management, which was the culmination of scientific and managerial thinking back through the mid-eighteenth century. Scientific management and the resulting industrial efficiency movement, which became famous for its use of time-and-motion studies, were direct attempts to abolish the craft guild system, which had dominated shop floors for centuries, by applying a deterministic philosophy to business operations.

Determinism argues that the future (of people, things, systems) is controlled, or determined entirely by history, ruling out novel and unpredictable events that may arise out of interactions among causes. Determinism is usually accompanied by a belief that we are well along the road to knowing history sufficiently to make such predictions with complete accuracy.

The framework of scientific management was production quotas enforced by new pay and personnel systems, designed to require workers to meet scientifically determined work standards which were well above the then-accepted norms. Workers who accepted the scheme typically doubled or tripled their previous output-and increased their wages by 60%. As Matsushita-san would say almost a century later, management was assumed to have the good ideas and the workers' role was to carry them out.
Scientific management was highly successful at increasing the industrial output of the United States. And, it was quite appropriate for the times, given the high influx of immigrant workers, along with the resulting mix of languages and cultures. Yet in the light of the modern management theory of Shewhart and Deming, Taylor's system was substantially flawed.
Worse, Taylor would probably recoil in horror at what has become of his original philosophy today. We will deal with this outcome later in this chapter as "Neo-Taylorism."

Taylor's Forebears

As we will see, a hallmark of scientific management is Taylor's mechanistic view of both the organization and the worker. Taylor was far from the first to hold such a view. One of the first men to write about business-as we would know it today-and its problems was]osiah Wedgwood (1730-1795), from whom Wedgwood china takes its name. Frequently at odds with his workers over compensation, Wedgwood correctly identified mass production as a way of producing the most in a given period of time. When his company went through financial distress in 1772 he studied costs at each stage of his processes. Most importantly for our purposes here, Wedgwood may have been the first to want to "make such machines of men as cannot err."
A generation later, the social reformer Robert Owen (1771-1858), known for progressive treatment of workers at his textile plant in New Lanark, Scotland, nevertheless considered them "living instruments" and "vital machines." We will return to Owen in another context much later in this book.
Charles Babbage (1792-1871), one of the fathers of the computer, opined that management was a science, not an art, and restated the economist Adam Smith's arguments for division of labor. Unhappily, in his work "On the Economy of Machinery and Manufacture" he offered cost control and empiricism as that science. Both Henry Metcalfe (1847- 1917) and Henry Towne (1844-1924) favored the application of science to improve processes by means of recorded data about them.

Four themes seem to develop in the school of thought these men represented.

1. Businesses have existence separate from their owners.
2. The purpose of a business is to make a profit for its owners.
3. The worker is like a bionic machine, in whom loyalty,
imagination, or enthusiasm are considered at best neutral
qualities-at worst, liabilities.
4. Scientific and engineering methods should be used to improve business processes.

0n the scientific side, Taylor's chief forebear is much better known: Sir Isaac Newton.

Newton's very tenets of mechanism and predictability were what these early commentators wanted to apply to business. We will return to Newtonian thought later.

The Birth of Scientific Management

The management philosophy of our age is captured in the almost- synonymous terms "Taylorism" and "scientific management" The son of a successful lawyer in Philadelphia, Taylor attended the Phillips Exeter Academy and intended to enter Harvard University, but was prevented by eye problems said to be caused by night study. Instead, in 1874 he entered industry as an apprentice machinist at the Enterprise Hydraulic Works in Philadelphia, while continuing the activities typical of his upper-class status, such as playing tennis and cricket. Taylor completed his apprenticeship in 1878 only to be unable to find work in his trade, during the depression following the panic of 1873. He joined Midvale Steel Corporation as an unskilled laborer, rising eventually to a position in management and earning a degree in mechanical engineering from the Stevens Institute of Technology along the way.

Frederick Taylor had developed a reputation early in life for being different. He exasperated his early playmates by insisting on elaborate and strict rules for each game they played. At the age of 23 he was a member of the national tennis doubles championship team, and is claimed by at least one author to have been the first man in America to throw a baseball overhand. Taylor held over forty patents, and in his last years invented a two-handled putter which was quickly banned from the links by the U.S. Golf Association. In anything he pursued Taylor exhibited a frenzy for order, discipline, and optimization.

At Midvale he held a variety of jobs which allowed him to gradually develop and apply his theory of scientific organization of human work to achieve optimal processes. Biographers call him a man of two personalities: the ambitious son of genteel Quaker upbringing ("thee" and "thou" were still spoken at home), and the upper-class factory revolutionary using his studiously cultivated vocabulary of salty language to bully the men into following his new standards of efficiency.

Soldiering and Pay Incentives

Taylor's career as an unskilled laborer soon brought him into contact with deliberate output restrictions by the men, which he later called soldiering. Taylor classified two types: natural soldiering ("from the natural instinct and tendency of men to take it easy") and systematic soldiering (from the workers' careful thought and reasoning toward what they felt would best promote their interests). Systematic soldiering had, he said, "the deliberate object of keeping their employers ignorant of how fast work can be done." Taylor ascribed the continuation of soldiering to management's ignorance of what output levels were actually possible.

Soon after he was promoted to gang boss, Taylor reported, he was approached by one of his former mates who appealed to his sense of fellowship, warning him that if he tried to get the team to increase their work rates they would throw him over the fence. Taylor ignored such threats and, over the next few years, struggled to create the system of shop management that now bears his name.

One reason for soldiering, Taylor came to realize, was the failure of existing pay schemes to provide real incentive to raise production. Employers tended to reduce piece-rates, for example, when worker output even briefly increased, which taught the workers to collaborate

in bringing their productivity back down. He admitted that, “if he were in their place he [too] would fight against turning out any more work, just as they were doing, because under the piece-work system they would be allowed to earn no more wages than they had been earning, and yet they would be made to work harder.” Taylor’s attempts to replace this antagonism with “harmonious cooperation,” through production-based incentives and innovative piece-rate schemes, were to form one corner- stone of scientific management.
Another key observation of the same period was that management were ignorant of the details of the tasks to be done in their plants. Taylor saw that skilled workers were organized under the craft guild system with its progression from apprentice through journeyman to master of a particular trade. Under this scheme, the master craftsmen ran their respective shops as though they were managers, controlling not only production, but training and, of course, promotion to higher ranks. Although he held the interests of worker and management to be complementary, Taylor considered the control of the shops by the master craftsmen both inappropriate and inefficient, and he resolved to place control in the hands of management where he felt it belonged.

Three themes are clear in Taylor’s thinking of this period:

1. The concept of business as a vast and complex mechanism amenable to scientific analysis and, ultimately, control and prediction in Newtonian terms via standardization of all work
2. The inappropriateness of the craft guild system under “ordinary management,” which kept the know-how of production in the heads of the workers and foremen
3. The unequal division of labor between management and worker

These beliefs about the current system, combined with his mania for efficiency, led Taylor to begin experimenting when he rose to supervisory level. He broke tasks down into the smallest movements, and then determined what the “optimum” time was to complete each movement, how much weight was to be carried and how far, when the worker should rest and how long, and so on. If a task could be done by a less-skilled worker, it was shifted away from the skilled one. From these experiments the term “ time-and-motion study” originated.

Only the Best Workers

After these studies Taylor would set work standards and quotas that even first-class men would have to strain to reach. Taylor’s protestations of scientific accuracy notwithstanding, work standards derived from his system were substantially influenced by subjective considerations, such as defining what activities actually constituted the job, which workmen were to be measured, and what allowances were to be made for differences in materials and uncontrollable interruptions. He also studied how much additional pay would have to be offered to get the men to achieve the new levels, and settled on three pay groups ranging from 30% to 100% premium over what was paid for “average work.” Not surprisingly he now called his methods the “task system”; for the workman, its most prominent feature was “the setting of a measured standard of work for each man to do each day,” for which he was well paid-if he could meet the work standards. If not, he was severely penalized by Taylor’s new piece-rate pay system.
Despite initial resistance by some who had not been selected to be on piece-rates, the scheme

caught on quickly, with men waiting to be put on the new task system. Taylor extended its application from the shop floor to administrative and sales areas.
The result was a far more regimented workplace controlled by management according to Taylor's "one best way of doing things." Surprisingly, though, Taylor expected a great deal more, not less, from management: according to his new scheme, management should do about 50 % of the total work of the organization in its activities of selecting, training, and motivating workers. Supervisors were expected to work closely and continuously with the men to see that the new standards were adhered to. Where this philosophy was followed, productivity rose.
Although he was later to be vilified by organized labor, Taylor's early experiments were largely popular with the men, as he would argue to management that they should receive raises proportional to their increased marginal productivity. His belief in optimal systems and management control soon outweighed his sympathy for the men, however, and he became a champion of work standards and pay systems that forced the worker to follow his standards and be first -class men, or be replaced. Taylor clearly intended to run the place with only the best workers. He rationalized this to himself on the basis that scientific management always created more jobs, which the ordinary men who had been forced out could take.

Success and Controversy

In 1898, Taylor accepted an offer from Bethlehem Steel Company to come and work exclusively on the application of his system. He also found time to do research there with the metallurgist Maunsel White, which resulted in the development of a formula that revolutionized the machining industry. Their tool-steel alloy, heat treatment, and procedures for using the tools allowed tools to cut metal at rates several times faster than possible before. Their work was recognized with the award of a gold medal at the Paris Exposition in 1900.
In 1901, at the height of his career, Taylor left Bethlehem over a disagreement with management: he had demanded that the men he given more pay and time for leisure in proportion to the increased efficiency his system brought to their work. Until his death, he offered his consulting services free to anyone interested in "the one right way to do a thing"; his business card read "Systematizing Shop Management and Manufacturing Costs a Specialty." For the remainder of his life, however, Taylor was relatively inactive, even turning down an offer to become president of the Massachusetts Institute of Technology.
The effects of Taylor's theories on turn-of-the-century American industry were nevertheless rapid and substantial. The manufacturing world that Taylor entered had been closer to craft production that to manufacturing as we know it today; by the time of his death in 1915, the improvement of production under scientific management formed a logical extension which permanently changed business from its haphazard earlier state. The mass-production era under modern management had begun.
Of course Taylor was not the only laborer in the vineyard. Men like Sorensen and Flanders, and their boss Henry Ford, spent six years experimenting with moving assembly lines before installing the now-famous one at Highland Park in about 1913, and their concerns were much broader than Taylor's. At Ford, the goal of 100% interchangeability of parts meant that having a man do a job was a temporary last resort if no machine were available yet to do it. In addition Ford achieved significantly greater division and concurrency of labor in his continuous assembly lines than Taylor ever did working with individual laborers but

“Speedy” Taylor’s paradigm of efficiency and standardization was already a part of the spirit of the automobile age, and at least part of Ford’s work can be seen as an extension of Taylor’s.
Not all of the consequences of Taylor’s ideas were necessarily to his liking. By 1911, when his book The Principles of Scientific Management was published, Taylor’s methods were the subject of national debate, and he himself had become the darling of various movements that he probably despised. That same year, pressure from trade unions and other parties caused the U.S. House of Representatives to convene a special committee to investigate Taylor’s methods; Taylor himself gave lengthy testimony. In addition, Lenin called for adoption of scientific management in the organization of Russian factories under Communist rule. For better or worse, Taylor’s management philosophy, with inevitable corruption, has dominated the twentieth century, the one major exception being post-l950 Japan.

Scientific Management Principles

In his book, “The Principles of Scientific Management” (1911), Taylor listed four principles, shown in the following list. We have elaborated on the implications of each principle:

1. Develop a science to replace the old rule-of-thumb knowledge of the workmen, which the workmen kept in their heads. Reduce this knowledge to laws and rules and formulae.

Assumes a Newtonian clockwork universe
Provides no principle of learning, just a transfer of knowledge (no indication of how)
Suboptimizes at the task level
Expects identical results in future
Does not consider variation
Breaks the craft guild system
Gives revolutionary, discontinuous improvement

2. Scientifically select the workmen. Then progressively develop them.

Makes Newtonian assumptions of knowledge and ability to select the workmen

3. Bring together the science and the scientifically selected workmen.

Provides extrinsic motivation
Conditions company’s loyalty to both workers and management on compliance with work standards
Demands quotas for above-average performance from all workers

4. Divide almost equally the work of the establishment between the workmen on one hand, and the management on the other.

Assumes that everyone needs to he supervised
Creates multiple layers of supervision to enforce standards and quotas

Creates ladder for ambitious managers to climb

Flaws of Scientific Management

What, then, are the flaws of scientific management that we speak of? They are many. For each of the flaws shown below we have included a commentary to show its effects in our own time under the heading of neo-Taylorism.

1. Belief in management control as the essential precondition for increasing productivity
2. Belief in the possibility of optimal processes
3. Narrow view of process improvement
4. Low-level suboptimization instead of holistic, total-system improvement
5. Recognition of only one cause of defects: people
6. Separation of planning and doing
7. Failure to recognize systems and communities in the organization
8. View of workers as interchangeable, bionic machines

1. Belief in Management Control as the Essential Precondition for Increasing Productivity

Formerly, shop-floor workers had the monopoly of production knowledge; improving productivity meant management had to wrest that control from them.
Workers were assumed to routinely restrict their potential output, and to conceal their knowledge of how to increase production.
Management believed in enforced work standards and even enforced cooperation.

Taylorism in Action Today (Neo- Taylorism)

Your boss is your customer.
Management increasingly answer to stock market analysts and bankers.
Management are preoccupied with manipulation of the work force, especially through the dual means of reward and punishment.
Planning is reserved as a managerial activity

Contrast Deming's insistence that management's job is not to control but to lead, to coach, to provide methods and tools. The result is control-statistical control.

Belief in the Possibility of Optimal Processes

Taylor's deterministic outlook assumes static laws and relationships govern the performance of any system, hence all business systems; the inherent randomness in all processes is unrecognized.
Process optimality (Taylor's " one right way to do a thing") assumes the absence of

variation; so variation in a worker's output was ascribed to soldiering or lack of desire to be a first-class man.
All needed information is assumed to be knowable.
Everyone was required to produce at levels well above those of even first-class men, enforced by a pay system that heavily penalized substandard performance.

Taylorism in Action Today (Neo- Taylorism)

Perfectionism-a belief that "best efforts" will achieve optimal results
Management by objective (MBO) as a vehicle for enforcing perfectionism
Rejection of continuous improvement
Belief in certification as a guarantee of quality
Demands for repeatability of processes
Denial or minimization of failures, and dismissal of the opportunity to learn from them
Reliance on reengineering and automation as a substitute for reducing inherent process complexity
Spreadsheet mentality in planning (assumption that fixed or linear relationships exist among variables)
Quotas and work standards
Hiring only high-GPA college graduates
Employee ranking and rating schemes
Imitation of others without understanding why, how, or even if they get their results
Multiple supplier for the same product when a single-supplier relationship would be feasible
Concentration on measurement of outcome rather than understanding of the underlying system of causes

Contrast Deming' s emphasis on continual learning and improvement, and the unknowability of the most important optimization data. Contrast Deming's emphasis on understanding of variation, special and common causes, and statistical control; also, his pleas to scrap the "merit', system.
Contrast Deming's and Shewart's position that there are no true values (of observed phenomena) against management beliefs that everything is quantifiable and knowable.
Contrast Deming's insistence on using the Shewhart Cycle for never-ending learning in order to understand and reduce variation.

A Narrow View of Process Improvement

Minimal, if any, focus was on product quality.
Improvement was limited to selecting, training, motivating, and supervising the workers (these are in fact the areas addressed by Taylor's Four Principles of scientific management).
An "optimum" process was selectively determined off-line by experts, meaning people trained in scientific management.
De-skilling of tasks (reducing the number of functions included) to reduce costs and enable time-study often left skilled workers "over-qualified" and therefore "over-paid"; this move was partially aimed at the disfranchisement of skilled labor.

Concentration was on minimums (time) and maximums (output) rather than on averages. Introduction of new processes and techniques developed off-line was occasional and discontinuous.

Taylorism in Action Today (Neo- Taylorism)

Manipulation of the symbols of progress, instead of real improvement (looking good vs. being good). (See section 4.2, "Phases of Learning.")
Chasing awards, prizes, and publicity instead of pursuing improvement
Management reorganization used as a substitute for process improvement
Adoption of spurious measurement systems which ignore variation
Adoption of current fad programs as "the one best way"
Satisfaction with merely meeting specifications
Reliance on technology, planned invention, and "silver bullets" instead of on continuous improvement
Emphasis on documentation rather than on improvement of processes
Lack of emphasis on continuous learning, and an unwillingness to learn from the past
Teaching immediate job skills instead of educating people to think, analyze, and gain new knowledge

Contrast Deming's use of scientific method (PDSA cycle) to isolate and reduce the flaws and complexity causing variation.
Contrast Deming's (and others') principle that any system is the product of the interactions among its parts, not the sum of individual performances of the parts. Consider Deming's position that, as powerful as process improvement is, the truly great leverage in improving an organization comes from treating problems of the system, e.g., how people are regarded and treated ("We haven't yet learned how to live.").
Contrast the ideal of developing and increasing knowledge as described in lkujiro Nonaka's paper "The Knowledge-Creating Company" (Hazard Business Review, November-December 1991).

Pre-Learning or Non-Learning Phases

1. Ignoring Problems. Turning our backs on a problem in the hopes that it will go away, or does not really exist, usually means that it will be even worse when we finally turn around.
2. Manipulating the Symbols of Solution. Superficial or cynical approaches to "doing something" about a problem deny us the opportunity to gain the knowledge required to solve it.

Learning Phases
3. Solving Problems. Direct, narrowly focused problem solving approaches may resolve the immediate problem but often ignore systematic causes.
4. Defining Problems The scientific method provides the basis for gaining new knowledge, plus greater awareness of what learning is.

5. Questioning Problems. Exploiting the knowledge available from contradictions and inconsistencies between our theories and the real world greatly enhances our ability to improve the system that lies beyond our immediate concern.
6. Adopting a Principle of Learning. Recognizing the need for continuous learning and improvement of the system leads toward knowledge which enables us not only to make the system better, but to continually move its boundaries outward .

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