

Advances in Project Management Series¹

What has Taylor ever done for us? Scientific and humane management reconsidered

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Pioneers pave the path for those who follow by shaping the discipline and defining the terrain. They also play a crucial role in surfacing and enshrining basic assumptions that permeate thinking and logic around the emerging discipline. As a leading pioneer in the development of management thinking, Taylor's influence on the discipline of project management merits exploration and analysis in the context of the wider philosophy of management.

Fredrick Winslow Taylor (1856-1915) is considered a principal innovator in industrial engineering, especially in relation to improving efficiency and utilising time and motion studies. He is particularly renowned for establishing *the principles of scientific management*, through the release of a monograph bearing that same title in 1911.

Taylor was born into a wealthy Quaker family from Philadelphia, yet started his professional life on the factory floor as an apprentice pattern maker. He became a chief engineer at Midvale Steel Works, before moving to the Bethlehem Steel Company, where he pioneered time and motion studies, analysing how each specific job could be done more efficiently. He was often seen walking around the factory floor with a stopwatch and note-pad, breaking down manual tasks into a series of components that could be measured (Hindle, 2008; p. 309). According to Drucker (1974; p. 181), Taylor was "the first man in history who did not take work for granted, but looked at it and studied it". Moreover, Drucker also maintained that between them, Darwin, Ford and Taylor, were the makers of the modern world.

Taylor has been instrumental in the development of modern management. *The Principles of scientific management* was the first business book best seller. The text has inspired administrators and efficiency aficionados to adopt productivity-enhancing and waste-reducing procedures and measures. The influence of the book has endured for over a century and the many translations have been known to inspire the writing of Henri Fayol in France, the development of the movement for Scientific Management in the UK headed by Major Lyndall Urwick, who would later become Britain's first

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professional management consultant, the efficiency and improvement schemes of Italy's Mussolini, and the target setting advocated by Lenin for Soviet workers. While failure to meet explicit production targets may have directed Soviet workers to the gulag (Hindle; p. 310); the principles of scientific management remain at the core of modern management thinking underpinning a great deal of theory and concepts in administrative studies, work design, industrial era organisation, and decision theory.

A 1997 Fortune article noted that: '*Taylor's influence is omnipresent. It's his ideas that determine how many burgers McDonald's expects its flippers to flip or how many callers the phone company expects its operators to assist.*' (Farnham, 1997)

What's the big idea?

According to the Economist Guide to Management Ideas and Gurus, *scientific management* was the first big management idea to reach a mass audience, as it swept through corporate America in the early years of the Twentieth Century, before spreading to continental Europe and the rest of the world. Moreover, The Guide also claims that a significant proportion of subsequent management thinking has been either a reaction to scientific thinking or a development of it (Hindle; p. 159).

The label 'scientific management' is borrowed from the work of US lawyer and judge, Louis Dembitz Brandeis who described the need to coordinate enterprise to everyone's benefit. Likewise, Taylor was a strong believer in increasing the total benefits and welfare of all participants.

'The principal object of management should be to secure the maximum prosperity for the employer coupled with the maximum prosperity for each employee.' (Taylor, 1911; p. 9)

The imperative to improve efficiency quotes US President, Theodore Roosevelt's reflection that '*The conservation of our national resources is only preliminary to the larger question of national efficiency*'.

Scientific management was thus positioned to stem national inefficiency, through the proposed universal remedy of systematic management. The explicit purpose of the published work was therefore:

'To prove that the best management is a true science, resting upon clearly defined laws, rules, and principles, as a foundation. And further to show that the fundamental principles of scientific management are applicable to all kinds of human activities, from our simplest individual acts to the work of our great corporations, which call for the most elaborate cooperation. And, briefly, through a series of illustrations, to convince the reader that whenever these principles are correctly applied, results must follow which are truly astounding.' (ibid.)

Scientific management

Scientific management boils down to five simple principles (Morgan, 1997; p. 23):

1. Shift all responsibility for the organisation of the work from the worker to the manager
2. Use scientific methods to determine the most efficient methods for completing the work (while specifying the precise way in which the work is to be done)
3. Select the best person to perform the 'designed' job
4. Train the worker to do the work efficiently
5. Monitor worker performance to ensure the appropriate method is followed and that the appropriate results are achieved

The principles imply total visibility, strict accountability and absolute control. Indeed, according to Taylor (1903), the art of management had been defined, '*As knowing exactly what you want men to do, and then seeing that they do it in the best and cheapest way.*'

The origins of scientific management lay in Taylor's observations of his fellow workers, recognising that they had no incentive to work harder or go faster, as ultimately it was in their interest to keep their employers ignorant of how fast work can be done. Noting that the workers had a clear advantage in knowing how fast they could actually work, Taylor measured and examined all aspects of work to derive an understanding of what each task entailed, thereby engaging in an organised 'pursuit of more' (Crainer, 2000; P. 9).

Measuring each and every task enabled organisations to estimate and predict the duration of jobs involving multiple tasks. Work could thus be scheduled, monitored and controlled using the new knowledge regarding individual tasks and their expected durations. Moreover it enabled specific processes to be reengineered and improved for efficiency purposes.

Taylor's crucial contribution was to invent management as science through the application of rigour and discipline that come from observation and measurement (Crainer, 2000; p. 11). Scientific management established the manager as a supervisor engaged in measurement, laying the foundation to the philosophy that 'what gets measured, gets done'. In the process, it created a new middle layer of management; a new stratum concerned with observation and measurement of efficiency. Crainer notes the ironic twist that the man most dedicated to efficiency, thus created one of the most significant barriers to business efficiency and decision making (ibid.).

Separating thinking from doing

After Taylor was promoted from operator to 'gang boss' in the machine shop at Midvale, the workers asked him not to interfere with the allocations of work. His answer was that as an operator he did not break a single rate set by the group but that as a supervisor, he intended to get more work out of them (Savage, 1996; p. 171)

'In the past the man has been first; in the future the system must be first.' (Taylor, 1911; p. 7)

Taylor's first-hand experience on the factory floor convinced him that it was necessary to gain control of the production process. In order to improve efficiency, he believed that managers were required to do all the thinking related to the planning and design of work, leaving workers with the task of implementation. Jobs were often simplified to ensure that workers would be cheap, easy to train and easily replaceable. Through the singular and all-consuming focus on efficiency Taylor turned men into machines: A non-personal, static, and obedient resource used for its muscle power.

'In our scheme, we do not ask the initiative of our men. We do not want any initiative. All we want of them is to obey the orders we give them, do what we say, and do it quick.' (Taylor, 1911, p. 11).

The purpose of collecting scientific data was to facilitate the separation between planning and doing:

'Thus all of the planning which under the old system was done by the workman, as a result of his personal experience, must by necessity under the new system be done by the management in accordance with the laws of science... It is also clear that in most cases one type of man is needed to plan ahead and an entirely different type to execute the work' (ibid.; p. 38).

The basic unit of work for both measurement and allocation was the 'task', which became the single unit of scientific management. Taylor's idea was that the planning office would provide comprehensive written up instructions specifying what is to be done, how it is to be done, and how long it would take to complete the tasks. Workers would simply be tasked with executing the instructions.

'This separation of thinkers from doers was the apogee of specialization: Planning was to be distinct from execution. Brain distinct from brawn, head from hand, white collar from blue collar.' (Reich, 1983).

The principle of separating the planning and design from execution, and the intended desire of freeing the workers from the need to think flow naturally from the desire to simplify tasks, improve efficiency and throughput, reduce waste and increase monitoring and control. They are also responsible for many of the dysfunctional aspects of life cycles and work schemes that we still employ nowadays. Note for example, the growing interest in agile development, which involves stakeholders in the requirements and design activities through rapid iterative cycles of learning and development, thereby overcoming the artificial separation imposed on the cycle of work for managerial and efficiency reasons. Likewise the assumptions that execution cannot proceed, until the full and exact details of what needs to be done have been completed also features in some environments and life cycle configurations that persist in maintaining a purely sequential approach rather than allowing for progressive or iterative elaboration of detail. Prototyping and agile approaches re-establish the value of intertwined planning and development, requirements and design, allowing products,

knowledge and expectations to evolve and adapt based on emerging needs, improved insights and continuing engagement.

Removing expertise and knowledge

One side effect of Taylor's approach was the replacement of skilled craftspeople, with unskilled workers only trained to do specific tasks in prescribed ways.

'In the words of historian Steven Diner, Taylorism robbed workers of "all matters of judgements about their jobs: What tools to use, in what order tasks should be performed, how many pounds they should lift at one time, how fast they should work, when they should rest—in short, every aspect of control over work.' (Cherny, 2002)

As part of the apparent deskilling, workers thus lost valuable expertise, knowledge and crucial judgement and decision making skills that could have been shared with other professionals. The resulting inability to think, adapt and respond to change and deviation also means that specialist knowledge and insights and the ability to make professional judgements were removed from the professional workforce and transferred to the new management cadres, further deskilling future generations while degrading, and even eliminating, craftsmanship, professionalism and ethics from the front line of workers.

Taylor's biographer, Robert Kanigel (2005), observed that 'after Ford and Taylor got through with them, most jobs needed less of everything—less brains, less muscle, less independence'.

Ironically, it would seem that the rigid and inflexible 'pursuit of more' that provided the impetus for scientific management, had ultimately resulted in securing less all around...

Implications of Scientific Management

Taylorism confers power to those in control: The wide adoption of Scientific Management in capitalist settings as well as many autocratic and socialist regimes signifies that it is as much a tool for securing general control over the workplace as it is a means of generating profit (Morgan, 1997; Hanlon, 2015).

Scientific management was a product of its time: As people moved from agriculture to the cities and engaged in industrial tasks, its chief concern was with adding a lens that could focus on management, improvement and control, thereby enabling an improved ability to plan, estimate and measure their combined work.

On the positive side, Taylor's input to scientific management offered a number of benefits and longer-term impacts:

- Great efficiency of performance
- Made management a relevant discipline and study area
- Emergence of time studies

- A new focus on tasks
- An emphasis on measurement, and later on quality management

Yet, the shift towards a machine way of thinking about people in the workplace has been responsible for other impacts, raising new concerns, criticisms and challenges, including:

- Life was never as controlled and predictable as Taylor envisaged
- Difficulty in adapting to changing circumstances
- Measurement under stable conditions is context-specific, offering limited universal credibility
- Inhumane character of the approach: Lack of attention to employees and their needs
- Treats employees as robots/machines
- Moral and ethical aspects ignored
- Promise of improved efficiency at societal level, never materialised
- The approach encourages uniformity of thinking
- Can result in mindless and unquestioning bureaucracy
- Can result in unanticipated and undesirable consequences
- Stifles innovation
- Strips the organisation of flexibility and resilience
- New problems are often ignored (as there are no mechanisms for addressing them)
- Paralysis, inaction or excessive meetings to deal with unexpected events
- Segmentation, silos and internal barriers are raised
- Consequently, a general inability to solve problems in proper context
- Information may get distorted
- Organisational passivity to change
- Apathy, carelessness and lack of pride
- Discourages initiative
- Sub-optimisation instead of global excellence
- Limits rather than builds on individual strengths, potential or capabilities
- Employees cannot develop or grow
- Not suited to modern times
- Unnatural separation between planning and doing
- Deskilling workers

'Fredrick Taylor's 'Scientific Management', well adapted to the simple industrial companies of the early century, has been stretched to the limits of its applicability. We now struggle with the costly and discouraging side effects of ... 'production first, people second': declining productivity, dissatisfaction with work, hatred and hostility as the basis of a general union-management deadlock, loss of pride in workmanship and the near extinction of workers' organisational pride.' (Butteress & Albrecht, 1979)

What about the people involved?

Many organisational psychologists despair of the Taylor's legacy. In his endeavour to maximise manual efficiency, Taylor abandoned the nuances and strengths of human nature and capability, displaying psychological illiteracy. Indeed, a key criticism of Taylor's approach was that he treated people as machines.

'We never had any use for Taylor or any of the efficiency or scientific management crowd. They never realized that human toil was the last thing in the world you had to be efficient about.' (Scott, 1965).

A key omission from Taylor's work was the interest in human relations and the impact of change and tinkering in the workplace on individuals, their health, dedication, motivation, performance, confidence, capability, decision making skills, innovation, and willingness to support the organisation.

One of the early critics of Taylor's work, often credited with initiating the human factors or human relations movement is Lillian Gilbreth, who was interested in exploring the psychological element within management in order to complement and augment the scientific management perspective. Her book, *The psychology of management: the function of the mind in determining, teaching and installing methods of least waste* was published in 1914. The work emerged from her doctoral dissertation at the University of California. When the university refused to grant Gilbreth the degree due to her failure to complete the residency requirements, she published it in a series of articles in *Industrial Engineering and Engineering Digest*, before releasing the full manuscript in 1914.

Throughout the book, Gilbreth contends that scientific management recognises the individual not only as an economic unit of production but also as a personality. Management must therefore encompass the human element, thereby rising beyond Taylorism to address the fuller scope of managing. The book itself emphasises knowledge of the individual, the theory of groups, theory of communication, and the rational basis for decision making. The contribution has been essential in positioning psychology in the context of management and emphasising its role and value over a century ago, at a time when Taylor was still promoting the employee as a machine concept. The book has been selected by scholars as culturally important and is recognised as part of the knowledge base of civilisation indicating its role as an influential founding text. Lillian and her husband Frank Gilbreth are credited as bringing together two of the main streams of management thinking. Although their work has become less popular nowadays, Lillian Gilbreth is still recognised as the 'first lady of management' (Hindle, 2008; p. 244).

From efficient to effective management

Taylor's focus featured an acknowledged national need and a lasting obsession in improving efficiency. By concentrating on efficiency he had managed to discount and ignore human factors and needs; addressing tasks and their execution without

considering the operator and their impact. Reducing humans to machines has enabled management to address efficiency concerns and make advances in the areas of time and motion, work allocation, quality assurance, process reengineering and process improvement. Yet, it is also worth noting that not all the changes and improvements proposed by Taylor were accepted; indeed, following resistance by the workers, Taylor himself was fired in 1901 bringing an end to his practical experiments within the company.

Gilbreth made important advances by progressing the search for efficiency to bring the human subjects and participants into consideration. Other advances around human relations, human activity systems, ergonomics, human centred design and human interaction followed over time. Yet, some of the classical ideas of 'Taylorism' still persist within management thinking and organisation. Psychology has a lot to contribute to management in general, and more specifically to the management of projects. Projects are done in groups; they require team members to communicate, empathise, comprehend, influence and engage. Moreover, there is a crucial need to understand what motivates individuals to improve performance within teams, and to encourage the adoption of proposed change. Delivering successful projects requires an understanding of people and psychology.

This month's article by Fred Voskoboynikov significantly advances that agenda by encouraging a deeper consideration of the psychological aspects of management, highlighting the role of the human element in managing. The article draws upon his recent book, *The psychology of effective management: Strategies for relationship building* published by Routledge. Throughout the work, Voskoboynikov distils the practical implications of good management practice that is centred on human performance and achievement.

Voskoboynikov acknowledges the dramatic changes in human work, which in contradiction to Taylor's view, increasingly require greater reliance on human intelligence, knowledge and insights. In order to address such a wider agenda new fields such as work physiology and occupational psychology are needed to integrate human capabilities and improve performance. Excelling and enhancing performance emerges from an understanding of the participants, and their strengths and capabilities. The implication is that in order to improve performance and deliver, organisations need to employ conductors who are able to bring different skills and expertise together, rather than efficiency experts and drill sergeants who endeavour to optimise individual tasks and minutiae.

The importance of the work is in shifting the conversation from an obsession with small scale, yet continuous improvement of the repetitive, towards a deeper understanding of the need to combine a range of skills and capabilities and adapt and adjust on the basis of the characteristics of the situations we encounter. Voskoboynikov is therefore able to progress the discussion from one concerned with mechanistic efficiency of operations and reduction of waste, towards one that addresses the challenges of modern life by embracing and acknowledging the role of effectiveness, and fitness for purpose management. The richness of working with people can therefore be used to excel,

improve and grow performance through the use of human capabilities, factors and relationships.

Returning to Taylor and efficiency

Taylor's legacy is a mixed bag of insights and findings. His obsession with efficiency has coloured his interests and perspective: Whilst still at college, Taylor succeeded in changing the official rules of Baseball by proving that over-arm bowling was more efficient than under-arm bowling. Alas, other efficiency work proving that tennis rackets shaped as spoons and Y-shaped golf putters are more efficient did not ultimately alter the respective sports.

The obsession with a single factor, such as efficiency, can often obscure other relevant perspectives and stifle further development. While Taylor was a pioneer, leader and guide in a time of much uncertainty, his approach was limited as it overlooked uncertainty and ignored the role of humans. Legislating for machines does not abolish human tendencies and concerns. The addition of psychology and human factor thinking to the repertoire of the management practitioner is an important, and necessary augmentation of perspective.

Ultimately, Taylor was a complex and controversial figure that Morgan (1997; p. 385) refers to as a man with an obsessive vision backed by a determination to implement it at all costs.

American engineer Henry Laurence Gantt similarly observed that Taylor was '*endowed naturally with untiring energy and a wonderfully analytical mind, he concentrated all the power of that combination on the problem of determining the facts he needed.*'

Efficiency, or 'doing things right' is crucial but only as long as we also ensure that we continue to be effective, by 'doing the right things' – as ultimately there is nothing worse and more wasteful than doing the wrong things but with an extreme, and forever improving efficiency.

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