

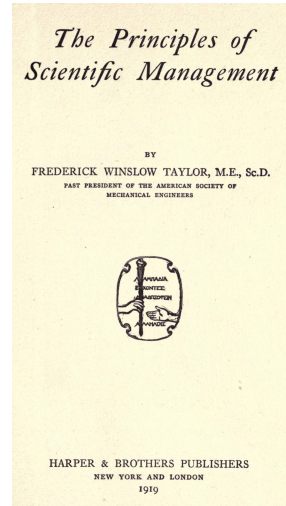
# **The Principles of Scientific Management**

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# Overview

- ▶ Frederick Winslow Taylor
- ▶ Book with the same name (1911)
- ▶ Contains the basic elements for Scientific Management or “Taylorism”



[https://upload.wikimedia.org/wikipedia/commons/9/90/The\\_Principles\\_of\\_Scientific\\_Management%2C\\_title\\_page.jpg](https://upload.wikimedia.org/wikipedia/commons/9/90/The_Principles_of_Scientific_Management%2C_title_page.jpg)

# Historical context

- ▶ Taylor was a foreman at a steel plant
- ▶ His workers stayed behind his expectations
- ▶ Taylor conducted research to find out why

# Historical context - Secondary sector

- ▶ Every worker was responsible for the complete production of an element.
- ▶ There was no specification *how* work steps were supposed to be done.
- ▶ Employers were looking for “the perfect man” for the job.
- ▶ Responsibility of work lies with the worker.
- ▶ Workers only work as much as needed.

# Book - Content

1. The fundamentals of scientific management
2. The principles of scientific management

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# Fundamentals - Management

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How can this be achieved?

Increasing productivity of workers

→ Increased profits

→ Increased wages



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1. Belief, that an increase in output of a single worker or machine would result in the dismissal of then obsolete other workers.
2. Workers are paid for work they done. Not showing, how fast it can actually be done, results in higher wages for less work.
3. “Rule-of-thumb” methods still had more importance than scientific approaches to solving a problem.

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# Principles - Initiative and Incentive

Existing management system: Management of Initiative and Incentive

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Existing management system: Management of Initiative and Incentive

- ▶ Initiative: A workers “best endeavors, his hardest work, all his traditional knowledge, his skill, his ingenuity, and his good-will”.
- ▶ Incentive: Given by the management to make workers use all of their initiative (e.g. increasing wages, promotions, ...)



# Principles - First principle

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How to find “the one best way”?

1. A number of experts attempts to complete a task.
2. Exact order of operations and tools documented.
3. Usage of a stopwatch to measure, which operations are the fastest ones.
4. Removal of wrong or unnecessary movements.
5. The best and fastest methods now get used by everyone.

# Principles - Second principle

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- ▶ It's not only about the methods, but also about the worker who applies the methods.
- ▶ Use scientific methods here as well.

# Principles - Third principle

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What does cooperation mean in this context?

- ▶ Find “the one best way” together?
- ▶ Monitor each other, so no one deviates from the first principle?

# Principles - Fourth principle

4. There is an almost equal division of the work and the responsibility between the management and the workmen. The management take over all work for which they are better fitted than the workmen, while in the past almost all of the work and the greater part of the responsibility were thrown upon the men.

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What are the new tasks for the management?

- ▶ The first three principles.
- ▶ Planning ahead and giving precise instructions.



# Schmidt - Background

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- ▶ Transportation of steel at the Bethlehem Steel Company.
- ▶ Each worker carried  $\approx 12$  tonnes per day.
- ▶ Wage: \$1.15 per day (regardless of amount carried).

→ How can this be improved?

# Schmidt - Applying Scientific Management

Taylor offered Schmidt a wage of \$1.85 (increase of 60%), but had two conditions:

1. Schmidt were to carry 47 tonnes per day now.
2. Schmidt would follow every instruction given to him.

# Schmidt - Principles

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3. They heartily cooperate with the men so as to insure all of the work being done in accordance with the principles of the science which has been developed.
4. There is an almost equal division of the work and the responsibility between the management and the workmen. The management take over all work for which they are better fitted than the workmen, while in the past almost all of the work and the greater part of the responsibility were thrown upon the men.

# Schmidt - Comparison to Initiative and Incentive

- ▶ At first glance very similar.
- ▶ Taylor recognizes the similarities regarding principles 1-3:  
“[They exist] in a small rudimentary way, but they are, under this management, of minor importance, whereas under scientific management they form the very essence of the whole system”

# Schmidt - Facts or...

- ▶ “Scientific” investigation in 1974:  
Wrege, Charles D., and Amedeo G. Perroni. “Taylor’s pig-tale: A historical analysis of Frederick W. Taylor’s pig-iron experiments.” *Academy of Management Journal* 17.1 (1974)
- ▶ Schmidt actually existed and worked there.
- ▶ His true name was Henry Noll.

# Schmidt - Fiction?

- ▶ Noll is presented as a dimwitted worker who wants to build a house.
- ▶ It wasn't Taylors idea to change the wages: the company had changed the wages from \$1.15 per day to \$0.0375 per tonne.
  - ▶ To get the same wage as before a worker now had to carry  $\approx 30$  tonnes per day.
  - ▶ Carrying 49 tonnes would yield Taylors promised \$1.85.
- ▶ Not all workers were able to carry 49 tonnes. Those who couldn't were simply ignored.

# Scientific Management - Used in practice?

- ▶ Yes, Scientific Management was implemented.
- ▶ Increased productivity, precise costs, ...
- ▶ Workers expected higher wages.
- ▶ International spread.



# Scientific Management - Criticism

- ▶ Special committee in the US to investigate Scientific Management - Hoxie report
- ▶ Work is now split up in physical and mental work.
- ▶ Physical work is split up in to many small parts, resulting in monotonous repetition.
- ▶ Scientific management itself results in outsourcing and lower wages.

# Scientific Management today - Secondary sector

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Car production line:

- ▶ Car moves between different stations.
- ▶ The same steps are repeated for all cars at one station.
- ▶ A single delay causes all following cars to be delayed.
- ▶ Improvements have been made.

# Scientific Management today - Tertiary sector

- ▶ Neo-Taylorism

Where are the same steps done repeatedly?

- ▶ (Fast) Food
- ▶ Customer support (flow charts)
- ▶ Templates for documents

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# **Thank you!**

**Stefan Grote**