

# A tale of two philosophies - Taylor and Deming: a Quality/Reliability case study with Ford and Chrysler

## Scientific Management

### Dr. Frederick Taylor

- Bethlehem Steel
- Big advances in heat treating of steels
- Math modeling to predict machining tool wear
- One variable at a time variation experimental method – improvement on non-systematic methods (later on resists DOE paradigm)
- Claimed that management could be made “scientific”
- In conjunction with Frank Gilbreath and others, created time and motion/efficiency methods
- The Taylorite disciples became the dominant industrial consultants and their methods/philosophy became the dominant paradigm in business and industrial engineering departments
- Emphasized role of management/professions for training and work instructions that workers would follow. This paradigm would stoutly resist the SQA/SPC movement.
- Create distinct departments that optimize their organizational efficiency in isolation of the overall organizational efficiency
- De-emphasized individual initiative and process ownership
- Complained on a visit to Detroit that the “men were running the shop” ala European craftsmanship, which needed to be stamped out
- Frank Gilbreath broke from the other disciples in favor of worker councils and work simplification vs. flow charts and timed work content

### Frederick Winslow Taylor



Taylor circa 1900

Hero or Zero? Beware of poison pills!

## What do the Japanese Industrialists and thinkers in the Japanese Ministry of Industry think?

A Japanese CEO's Commentary on "Taylorism"

"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/Panasonic Electronics, 1988

- See the white paper published in Japan entitled: "The Japan that can say No!"
- A salient anecdote stands out in the white paper so as to illustrate the Japanese think of American Taylorism vs. the worker; the difference between how workers are utilized in Japan vs. the United States of America
  - A Japanese chip maker had 4 foundries – 3 had excellent quality, but 1 had poor quality
  - The plants had "identical" layout, equipment, procedures, processes and employee training
  - After much effort management and engineering could not ascertain the reason for the poor quality in the troubled fab
  - A female line worker got to noticing that the quality went to Hell when trains went past
  - She washed here observations up to management and engineering and was taken seriously
  - Engineering determined that the seismic vibrations from the passing trains were seriously disrupting the sub-micron photo-lithographic processes
  - A cheap, but effective remedy was developed by engineering: dig a deep trench parallel to the train tracks spanning the width of the fab and fill it with water
  - The train's seismic vibrations were reflected back towards the train track and away from the fab.
  - EOP: End Of Problem. Hurray for thinking employees, who have been empowered by management and allowed to have true ownership in their jobs
  - An American worker probably would have been laughed out of the office

## Statistical Quality Control

### W. Edwards Deming

- BS EE, MS & PhD mathematical physics
- Works with Dr. Walter Shewart at Bell Labs
- Popularizes Dr. Shewart's work
- Goes to work for Census bureau and Department of Agriculture
- Studies with Dr. Ronald A. Fisher on Statistical Design of Experiments (DOE)
- Works with US Military WWII quality programs
- Goes to Japan to help with Census
- Invited to work with JUSE and management professional society on SPC/SQA
- Teaches Japanese industry SPC/SQA
- Discovered by Phil Caldwell COB Ford in 1981. Materially helps Ford Survive as a company
- Emphasizes a management philosophy largely antithetical to the Taylor paradigm
- Management responsible for 80% of quality issues
- Systematic approach (PDCA) to using SPC/SQA to cure manufacturing process issues
- Famously asked what he thought of management schools, to which he quipped: "They don't have the answers, they don't even know what the questions are!"

### W. Edwards Deming

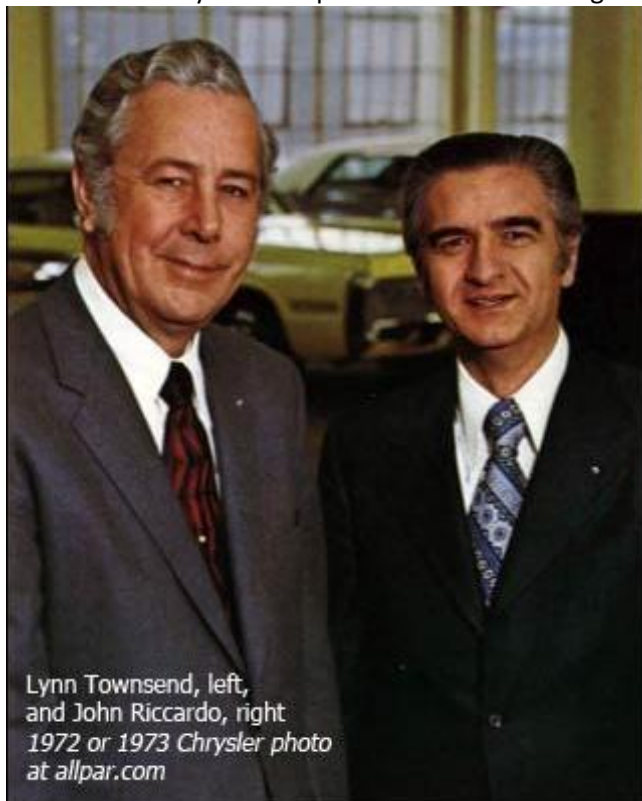


## Chrysler (SS Chrysler Concordia: Hero's and Villian's)

**Lynn Townsend (1966 President, 1967 COB)**

**John Riccardo (1970 President, 1975 COB)**

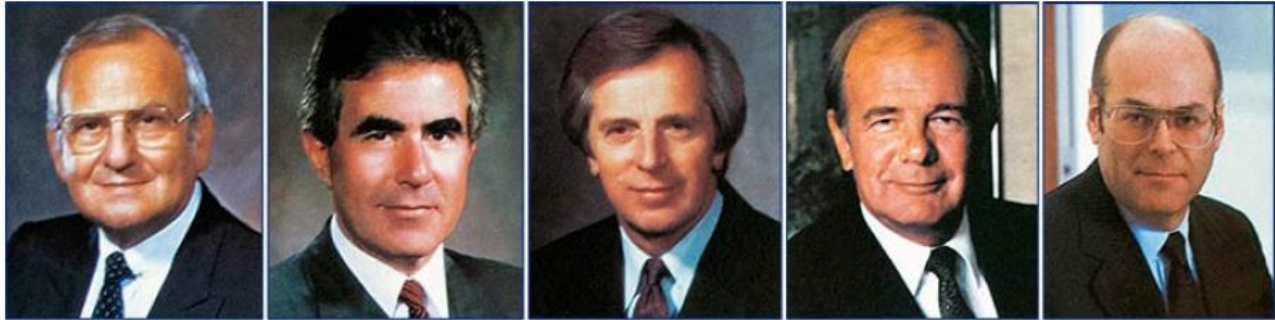
- Bean counter mentality
- Foolishly shaved on engineering, R&D and capital investment
- Over-built cars and Chrysler held inventory (inventory banking) to load level factories
- Business process was deemed to be more important than quality and manufacturing process
- Poor quality
- The Chrysler brand was badly damaged
- John could not do better than Lynn because his head was "Taylorized" too
- How can you solve the problem when you are the problem?
- The "Taylorite" captains were in the lounge when the ship hit the shoals!



The "Dynamic Duo."

**Lee Iacocca (1979 COB)** – Excelled in engineering, sales, negotiation, business and general management

- Henry Ford II fires Lee Iacocca as president in 1978 and opportunity comes knocking on Chrysler's door
- Closed several old inefficient sites that were not supporting the corporate mission
- Just In Time (JIT) stocking
- Sale of assets: marine, defense divisions
- Brilliantly negotiated "sweet" deals with banks, suppliers, union and the US Congress
- Camped out in each functional group and removed bad management, senior employees
- Brought in competent senior managers including a top notch QA guy
- Lee's primary QA program was to take a car off the line at random, drive it, bring it back with his list of complaints
- Great new product: K cars, Minivans
- Build to dealer order, dealer's hold inventory
- Used existing car inventory to barter, exchange for advertising time at local radio/TV stations
- The public sales face of Chrysler in advertising and Chrysler
- New marketing firm ("Built RAM tough")
- Bought AMC for Jeep and better engineering methodologies



Lee Iacocca, Gerald Greenwald, Harold Sperlich, Bennett Bidwell, and Robert "Steve" Miller (circa-1984 Chrysler photos at allpar.com)

- What happened after Lee Iacocca retired in 1992?
- 1991 Mr. Lutz becomes president, leaves in 1998 (engineer, should have become COB)
- 1992 Mr. Eaton becomes Vice-Chair, then COB (bean counter)
- Chrysler becomes Taylorized again
- Who would ever thought that one of the Big 3 would be bought by Fiat, unngh!
- By the way, the CEO of Fiat at the time was not a Taylorite, but rather a very competent Industrialist. What is wrong with this picture?

## The Ford Motor Company

### Phil Caldwell (1978 president, 1979 COB)

- Became president after Lee Iacocca fired
- 1979-1982 recession forces Ford near bankruptcy as it did Chrysler
- Down to last \$300M in bank. Phil later observes that “they were either going to have to go bankrupt or go into the baking business.”
- Phil recruits Ed Deming in 1981 and works with Deming to save Ford
- Phil provides the executive management leadership to make Dr. Deming’s work successful
- Taurus design/development starts under Phil’s tenure
- Phil retires and Donald Peterson becomes COB, then Taurus launched taking Ford out past Mars
- Some folks thought that Ford would overtake GM to become the largest car company



### Enter another villain, Jacques “the knife” Nasser

- The empire (Taylorism) strikes back and erases the legacy of Dr. Deming
- Ford quality and reliability suffers
- Another Taylorite bean counter makes CEO and COB
- A Jack Welch wannabe
- Hack and Slash to profitability (short sighted)
- Saves \$300M in outsourcing reliability testing to suppliers
- No more internal reliability testing for tires
- Ford Explorer has a problem with steering and suspension as seen during reliability testing
- Engineers want to fix, but management says no
- The “fix” for the quality of the ride (suspension problem) is to take tire pressure from 35 to 26 PSI
- Firestone had conducted large cost savings through material savings, so under-inflation would cause catastrophic failures
- The Ford Explorer over-steer condition (too sensitive) at speed and making sharp turns leads to flip overs
- Ford blames Firestone and forces a recall
- Firestone divorces Ford and screams bloody murder about the under-inflation condition
- Ford proactively spends \$4B to settle claims
- Where was the savings? Reliability pays!

### **What about the US space program? Surely it doesn't get more reliable than that?**

- Taylorites think that they are running a high tech bus service and not high tech space hardware
- Where's the original vision that gave NASA the right stuff
- NASA shuttle program manager is told that Morton-Thiokol engineers have decided/recommended to scrub the Challenger launch after it reaches 18F at the launch site
- The NASA shuttle program manager is not happy with what the tech guys have decided, so he escalates high enough in the Morton-Thiokol management chain to reach another Taylorite, who gives the go ...
- The SRB epoxy O-Ring joint seals (qualified down to 40F) have frozen and become brittle, hot gasses escape the SRB stage joints, the Challenger is history ... ☹
- Taylorism rears its ugly head again in the shuttle program as money is cut for the launch survey camera program (camera's not working) and folks not carefully looking for falling debris (such as foam from main LOX tank) that could damage the shuttle's heat shield tile
- The solvent (Freon-alcohol mixture) used to degrease/clean the outside of the main LOX tank is unadvisedly changed and the coating foam adhesion is made more marginal
- Heat shield tiles on Columbia are damaged from big foam chunks coming off the main LOX tank that are not seen because of a compromised survey camera program
- The Columbia experiences enormous heat upon reentry because of damaged heat tiles and the Columbia becomes history ... ☹
- NASA reliability guru's later calculate that the probability of a Shuttle disaster is one out of 230 missions or so
- The shuttle program is then scrubbed
- The US was reduced to "bumming rides" on Russian big dumb boosters