

Quality Management

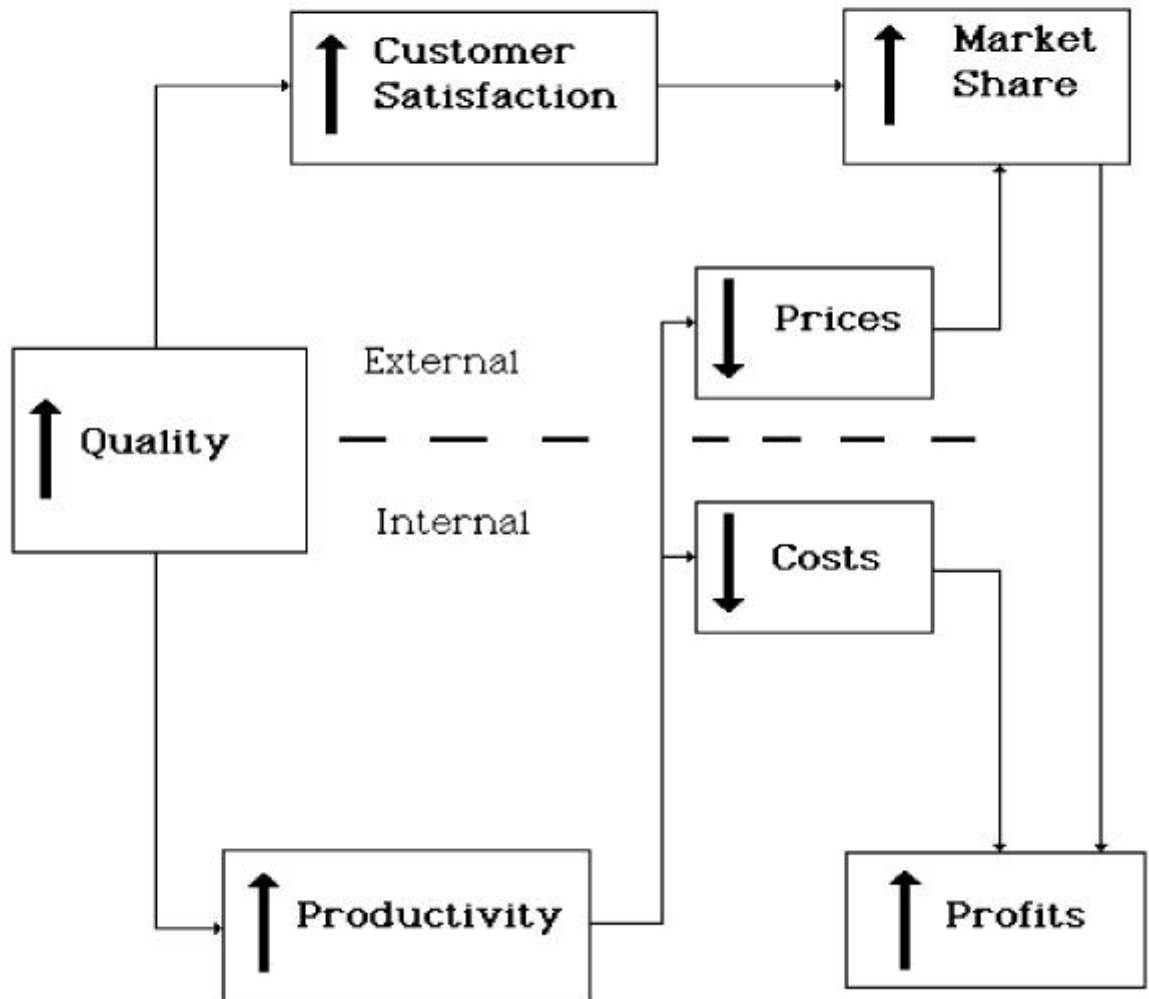
Deming's 14 Points for Management

The Secret of Success is Constancy to Purpose.

**Benjamin Disraeli
Speech [June 24, 1872]**

Deming's Quality Chain Reaction

Quality Chain Reaction



Another view of the Quality Chain Reaction:

Improve Quality → **Costs decrease because of less rework, fewer mistakes, delays, snags; better use of machine time and materials.** → **Productivity improves**

→ **Capture the market with better quality and lower price** → **Stay in business**

→ **Provide jobs and more jobs**

"So simple!"

(Deming)

Deming's Fourteen Points for Management:

- 1 Create constancy of purpose for improvement of product and services**
- 2 Adopt the new philosophy**
- 3 Cease dependence on mass inspection**
- 4 End the practice of awarding business on price tag alone**
- 5 Constantly and forever improve the systems of production and services**
- 6 Institute modern methods of training on the job**
- 7 Institute modern methods of supervision and leadership**
- 8 Drive out fear**
- 9 Break down barriers between departments**
- 10 Eliminate numerical goals for the work force**
- 11 Eliminate work standards and numerical quotas**
- 12 Remove barriers to pride of workmanship**
- 13 Institute a vigorous programme of education and training for everyone**
- 14 Create a structure in top management that will push every day on the above 13 points.**

Deming's Fourteen Points for Management

1: Create Constancy of purpose toward improvement of product and service, with the aim to become competitive, stay in business, and provide jobs.

The essence of constancy of purpose is customer orientation. - the answer to the question WHY?

Operational definition of customer needs is essential if we are to meet those needs and expectations at a price customers are willing to pay.

Essentials that top management must address:

- **Establish policy**
- **Establish core values**
- **Set the long-term strategic course**

Companies usually do have long-term vision, but have short-term systems, that focus on short-term results.

The danger is that

“today's short-term measures have long-term impacts.” *Peter Drucker*

Top management may be on course, but the rest of the company may be off somewhere doing their best.

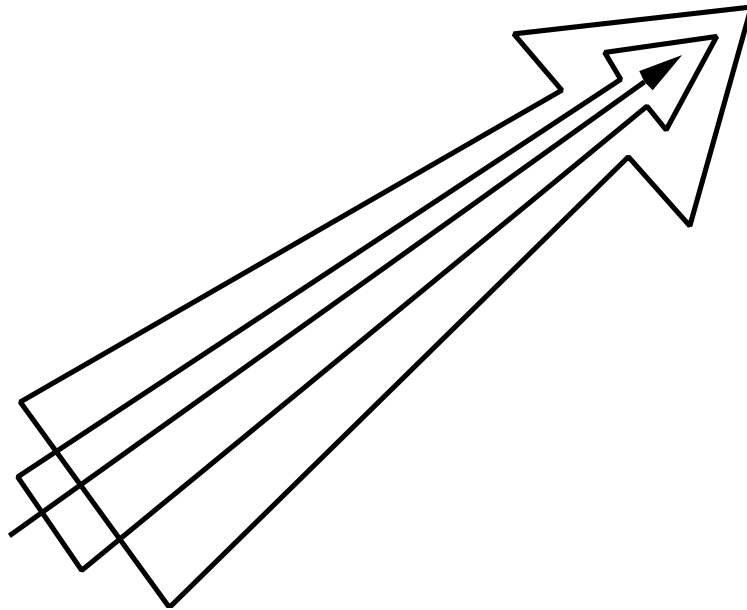
“Doing your best is not good enough. You have to know what to do. Then do your best.”

W E Deming

Constancy of purpose: Setting the course today to be in business tomorrow.

The problem of management is maintaining consistency of purpose: even when the aim is focused on the centre of the target, if the rest of the company is off doing their best without knowing what to do, results will not live up to expectations.

Consistency of purpose: Striving to reduce the “spread” around the course.



2 Adopt the new philosophy. We are in a new economic age, created by Japan. Western management must awaken to the challenge, must learn their responsibilities, and take on leadership for change.

Why?

What's wrong with the old philosophy?

“Back to basics”?

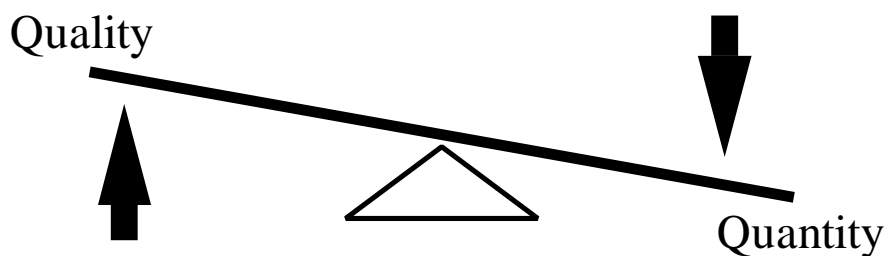
The Japanese attention to TQM principles has created a new economic age: the age of continuous improvement and systems thinking.

The new age centres on the statement:

“Higher quality costs less, not more.”

Folklore:

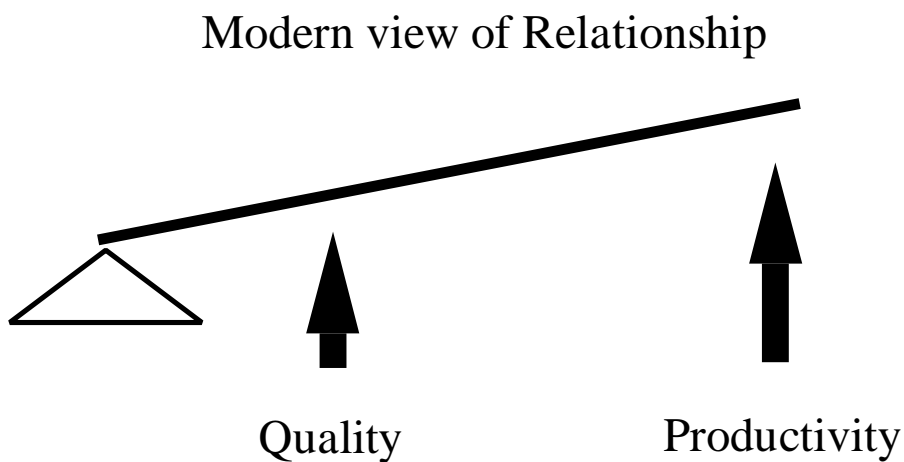
**Quality and productivity have an inverse relationship.
Outmoded Relationship**



Ask the workers: “Why does productivity increase as quality improves?”

Less rework

True relationship between quality and productivity:



Improvement of process

**leads to greater uniformity of product
reduces mistakes and rework
reduces waste of manpower, machine time, materials
increases output with lowered cost.**

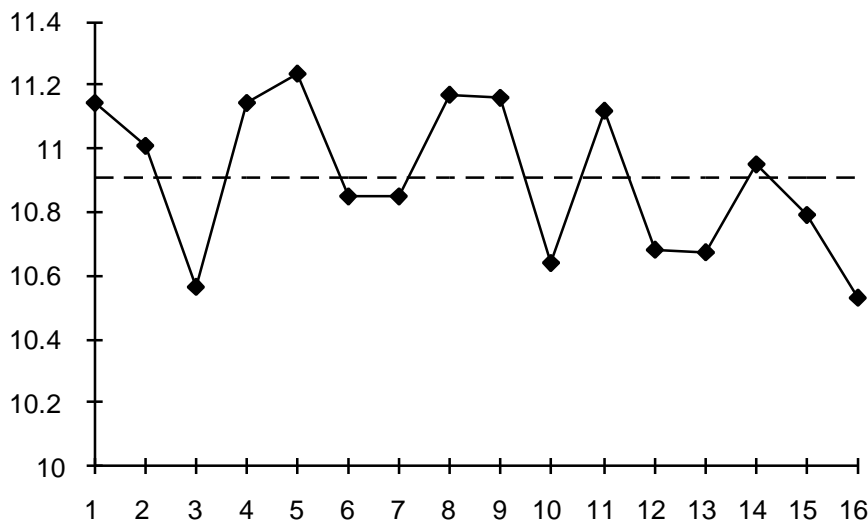
Other benefits:

**better competitive position
happier people on the job
more jobs
improved morale**

Case study (from Deming's consulting).

**Problems with a certain process: lots of errors - why?
"Work force make a lot of mistakes."**

Hmmmm.



(Figures from inspection records - supervisor never looked at them)

Should the supervisor know that this process is running at 11% defective?

What would the supervisor do if he did know that it was 11%?

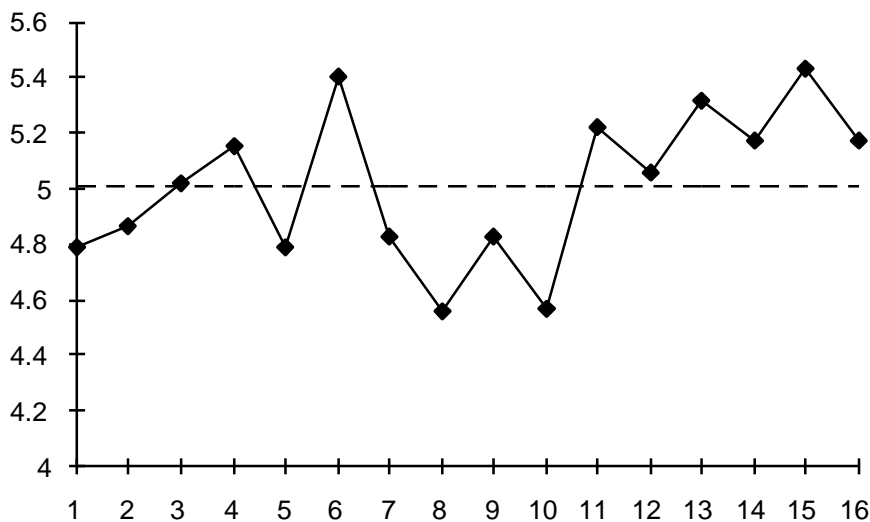
What is important to note here is that the process seems to be in statistical control.

Therefore - system must change to improve. - Management responsibility.

Deming - perhaps workers, and inspectors too, don't understand what kind of work is and is not acceptable.

Therefore - work on operational definitions.

Seven weeks later:



Results are obvious:

Quality is up

Production of good product is up 6%

Capacity is up 6%

Cost per unit of good product is lower

Profits are up

Customer is happier

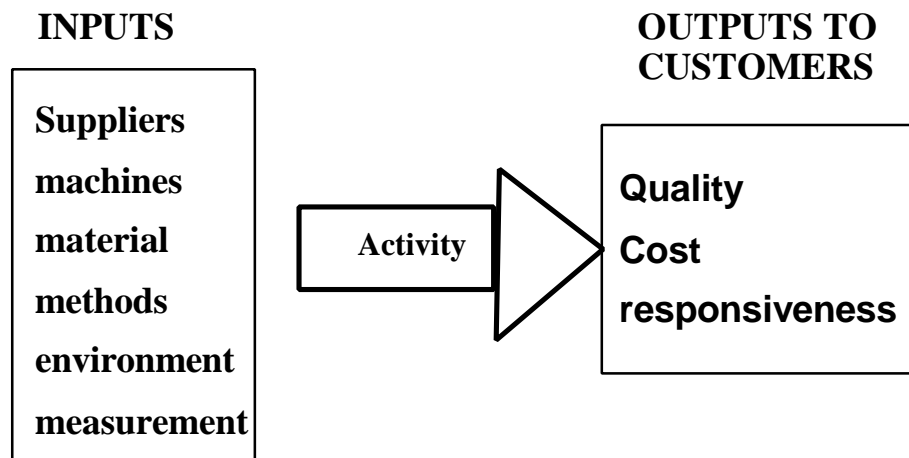
Everybody is happier

Meaningful change can only take place from within - focus on the competition will not ensure survival.

Focus on the customer, not the competition.

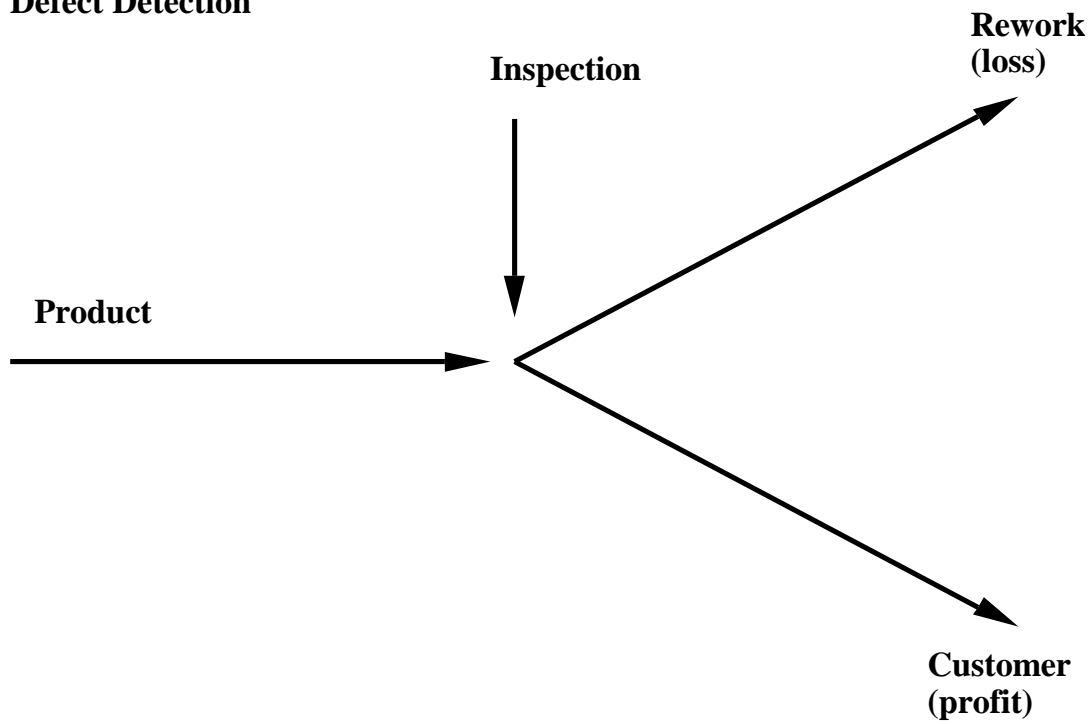
**3 Cease dependence on inspection to achieve quality.
Eliminate the need for inspection on a mass basis by building quality into the product in the first place.**

Recall our view of business systems as consisting of a large number of interconnecting processes.



Old way of doing business is to manage outcomes by detecting defects:

Defect Detection



**Look at a typical inspection process:
FINISHED FILES ARE THE RESULT
OF YEARS OF SCIENTIFIC STUDY
COMBINED WITH THE
EXPERIENCE
OF MANY YEARS**

(Count the F's)

From this we learn:

Inspection doesn't work!

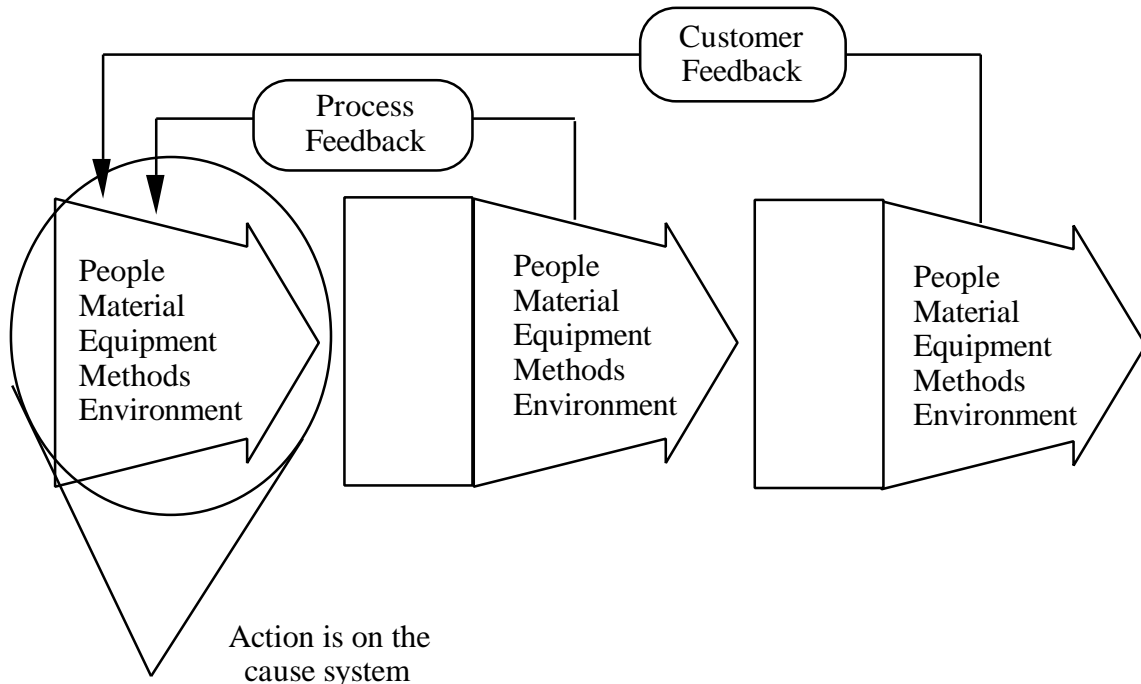
Some defective product always gets through.

Some good product may also be classified as bad.

Even 200% inspection doesn't work.

Detection of defects is not a viable competitive strategy.

A more modern view: Defect prevention, using both process feedback and customer feedback.



Key: understand variation.

4 End the practice of awarding business on the basis of price tag. Instead, minimise total cost. Move toward a single supplier for any one item on a long-term relationship of loyalty and trust.

Instead, require meaningful measures of quality along with price.

Reduce the number of suppliers for the same item by eliminating those that do not qualify with statistical evidence of quality.

Move towards a single supplier for any one item, on a long-term relationship of loyalty and trust.

The aim is to minimise total cost, not merely initial cost.

The real world, of course, is that often there is not a single supplier who is able to provide the required quality, it may be that there is not a single supplier who is good enough to be trusted with the responsibility and privilege of becoming your single supplier.

Why do this? The short answer is: reduce variation.

Variation from one supplier is bad enough - the additional variation caused by swapping from one supplier to another is self-inflicted injury!

The objective here is a customer-supplier relationship, and is an application of the "cooperation: win-win" philosophy.

The security of the long-term relationship allows the supplier to innovate.

5 Improve constantly and forever the system of production and service, to improve quality and productivity, and thus constantly decrease costs.

"Improve constantly and forever every process for planning, production and service. Search continually for problems in order to improve every activity in the company, to improve quality and productivity and thus to constantly decrease costs. It is management's job to work continually on the system (design, incoming materials, maintenance, improvements of machines, training, supervision, retraining)."

Some points to remember:

- 1 Putting out fires (tackling special causes) is not improving a process. This is more in the line of obtaining a process in the first place. We can say that we've got an established process when the variation in the process is almost entirely common cause variation - ie no special causes.
- 2 Emphasis on conformance to standards can obstruct continuous improvement.
- 3 The Deming Cycle is key to continuous improvement:

PLAN
DO
CHECK
ACT

6 Institute more thorough, better job-related training.

Institute modern methods of training on the job for all, including management, to make better use of every employee.

“Statistical thinking will one day be as necessary for efficient citizenship as the ability to read and write.”

H G Wells

New skills are required to keep up with changes in materials, methods, product design, machinery, techniques and service. Note that training is for *skills*, unlike education, which is for *knowledge* (Point 13).

Anyone, when he has brought his work to a state of statistical control, whether he was trained well or badly, is in a rut. He has completed his learning of that particular job. It is not economical to try to provide further training of the same kind ... continuation of training by the same method will accomplish nothing.

Inhibitors to training:

- It's for my people, not for me.
- It's for manufacturing, not for me.
- Our problems are different here.
- We rely on our experience.
- Hope for instant pudding.
- People learn in different ways.

Management cannot intelligently change company systems without an understanding of statistical thinking.

7 Institute Leadership. The aim of leadership should be to help people, machines and gadgets to do a better job. Supervision of management is in need of overhaul, as well as supervision of production workers.

Adopt and institute leadership aimed at helping people to do a better job.

The responsibility of managers and supervisors must be changed from sheer numbers to quality.

Improvement of quality will automatically improve productivity.

Management must ensure that immediate action is taken on reports of inherited defects, maintenance requirements, poor tools, fuzzy operational definitions, and other conditions detrimental to quality.

Some quotes from Deming:

"A LEADER'S JOB IS TO HELP PEOPLE AND TO KNOW WHEN PEOPLE NEED SPECIAL HELP. HE IS NOT A LEADER UNLESS HE DOES KNOW ".

"IF A WORKER CANNOT LEARN HIS JOB, WHY DID YOU PUT HIM THERE?"

"I USED TO SAY THAT PEOPLE ARE ASSETS, NOT COMMODITIES. BUT THEY ARE NOT JUST ASSETS: THEY ARE JEWELS".

"WHY LEAD? PEOPLE HAPPIER, QUALITY UP, PRODUCTIVITY UP, EVERYBODY WINS"

8 Drive out fear, so that everyone may work effectively for the company.

Encourage effective two-way communication and other means to drive out fear throughout the organisation so that everybody may work effectively and more productively for the company.

Fear is a barrier to improvement: wherever there is fear, we get the wrong figures.

Fear in work is opposite to joy in work.

Fear of change is a big barrier to be overcome: remember, people don't resist change, they resist being changed! The need is for everybody to be part of the change, and to own the change process.

Some common expressions of fear:

I am afraid that I may lose my job because the company will go out of business.

I have a feeling that Dave (higher up) may move to another company. If he does, what will happen to me?

I could do my job better if I understood what happens next.

I am afraid that I may not always have an answer when my boss asks me something.

I am afraid to admit that I made a mistake.

My boss believes in fear. How can he manage his people if they don't hold him in awe? Management is punitive.

Without an atmosphere of mutual respect, no statistically based system of management will work, nor any other.

Deming always says that this point is one of the most important for management to work on, because it affects nine of the other points:

- break down departmental barriers**
- cease dependence on mass inspection**
- institute education and training**
- institute training**
- eliminate slogans and exhortations**
- end awarding business on price-tag**
- eliminate work standards**
- continuous improvement**
- remove barriers**

Remember: an atmosphere of fear results in management getting a “filtered” view of the organisation.

9 Break down barriers between departments. People in research, design, sales, and production must work as a team to foresee problems of production and in use that may be encountered with the product or service.

Barriers breed suboptimization.

This is the direct opposite to the Joiner Triangle's 'All One Team' and Deming's 'Win-Win' principle.

Deming says quite bluntly that if the boss of every staff area perceives (or indeed is told) that his objective is to maximize his department's profits then the company will fail.

One of the most crucial differences between old-style and new-style management is seen in the way that shop-floor employees, supervisors, departments, middle-managers and senior managers regard their job: is it to suboptimize, or is it to work for the company?

It cannot be both.

Incidentally, Deming points out that one clear symptom of the suboptimization mode is proliferation of paperwork, resulting in considerable inefficiency, irritation and cost.

He quotes studies showing that 14% of freight charges are spent on paperwork, the figure in motor freight, in particular, being more like 20%.

10 Eliminate slogans, exhortations and targets for the work force that ask for zero defects and new levels of productivity.

Such exhortations only create adversarial relationships; the bulk of the causes of low quality and low productivity belong to the system, and thus lie beyond the power of the workforce.

What can be wrong with slogans? a few posters?

Indeed, surely posters can give useful and helpful information? Surely, slogans are useful to jog the memory on important matters, and thus aid greater commonality of thought and aims?

The argument is directed at those who simply tell (exhort) others to do better without helping them in any way so to do.

It demonstrates ignorance or disbelief of the fact that the large majority of problems lie in the system, the responsibility of management, rather than with the workers at whom the posters and slogans are aimed.

Deming:

“Posters that explain to everyone on the job what the management is doing month by month to (for example) purchase better quality of incoming materials from fewer suppliers, better maintenance, or to provide better training, or statistical aids and better supervision to improve quality and productivity, not by working harder but by working smarter, would be a totally different story: they would boost morale. People would then understand that the management is taking some responsibility for hang-ups and defects, and is trying to remove obstacles”

11 Eliminate work standards (quotas) on the factory floor. Substitute leadership. Eliminate management by objective. Eliminate management by numbers, numerical goals. Substitute leadership

Eliminate work standards that prescribe numerical quotas for the workforce and numerical goals for people in management. Substitute aids and helpful leadership; statistical methods for continual improvement of quality and productivity.

No, Deming is not telling us to manage without numbers!

And, of course, both companies and individuals need goals, intentions, and aims - but not in isolation; they need the education, training, systems and methods to make it reasonable for these to be attained. What they do not need is arbitrary numerical goals. Of course, a company needs budgets and forecasts for planning and allocation of resources—but they must also not be arbitrary numerical goals, nor must they become such.

From Joiner's paper with Peter Scholtes, Total Quality Leadership versus Management by Control:

“But there is an underside to management by control. Consider these examples:

- **An electronics firm typically ships 30% of its production on the last day of the month. Why? In order to meet the monthly shipment quota. How? By expediting parts from around the country, by moving partially-completed instruments ahead of their place in line and, occasionally, by letting quality standards slip.**
- **Another firm sometimes ships incomplete instruments. A service representative then flies around the country installing the missing parts. The shipment quota for the month is met again. Profits, at least on paper, hold firm.**
- **A chemical plant reports it cannot efficiently run at the mandated inventory levels, so it keeps inventories higher until June 30 and December 31 when inventories are measured. For those days, it depletes the inventories to an acceptable level, perhaps losing two days production as a consequence.**
- **Many managers annually negotiate safe goals and manage to exceed them, just barely. Some managers include on their list of negotiable goals figures which were already secretly accomplished prior to the negotiations.**
- **Production which exceeds the standards is stored so it can be pulled out and used another day.**

- **A meter reader stops at a tavern at 2 o'clock rather than exceed his work standard.”**

12 Remove barriers that rob the hourly worker of his right to pride of workmanship. The responsibility of supervisors must be changed from stressing sheer numbers to quality. Remove barriers that rob people (including those in management and engineering) of their right to pride of workmanship. This means, *inter alia*, abolishment of the annual merit rating and of management by objective.

Again, the responsibility of managers, supervisors, foremen must be changed from sheer numbers to quality.

“WHAT DO YOU HAVE WITHOUT PRIDE OF WORKMANSHIP? JUST A JOB, TO GET SOME MONEY. THERE'S NOT MUCH JOY IN THAT”

Some of the issues raised by Deming with respect to performance appraisals: An old Chinese proverb, which he is fond of quoting, will start us off:

“REWARD FOR MERIT CAUSES STRIFE AND CONTENTION”

The 80 American Nobel Prize winners did not have to suffer performance appraisal.

Performance appraisal is a bar to innovation:

'PEOPLE GET REWARDED FOR CONFORMING. NO WONDER WE ARE ON THE DECLINE'.

Let us pursue this theme a little further. The aspect of bad, old-style management behind the above quote is the desire of some managers for their employees to simply do as they are told—that is the employee's job, that is what he is paid for.

If that is the attitude, then there is neither room for change nor encouragement to contribute to change:

'PEOPLE ARE UNABLE TO CONTRIBUTE WHAT THEY WOULD LIKE TO CONTRIBUTE TO THEIR JOBS; THEY HAVE TO CONCENTRATE ON GETTING A GOOD RATING'.

'PEOPLE FIND OUT WHAT IS IMPORTANT FOR MERIT, AND DO IT. CAN YOU BLAME THEM?'

'STAY IN LINE; DON'T MISS A RAISE'.

'THE AIM BECOMES TO GET A GOOD RATING, TO PLEASE THE BOSS'.

And, in consequence of the kind of stagnation involved in these quotes:

'CAN ANYONE TAKE PRIDE AND JOY IN HIS WORK IN THAT SITUATION?'

Teamwork (in the sense of Joiner's 'All One Team' - Systems Thinking) is rendered impossible in such a climate. For who is the customer? It should be the real internal or external customer—the one who receives and benefits (or suffers) from the fruits of the supplier's labours. But it is instead the imposed customer, the boss, who supervises the work rather than being directly affected by it.

'GREATNESS TAKES TIME'.

At least, it usually does—there are the occasional Mozart-like exceptions to the rule, but they are rare indeed. It certainly takes more than the year over which an appraisal is based! Every company is familiar with the quandary with reference to its own investment strategy: does one invest for the long-term, with consequent apparent deterioration in this year's figures, or stay looking good for the moment at the expense of letting the future look after itself? If that is the quandary at the corporate level, what chance is there of an individual taking the long-term view? Indeed, why should he contribute to the long-term benefit of the company if the company's short-term reaction is to penalize him for his efforts?

One of the fundamental objections to performance appraisal has always been the very large proportion of influence of the system on an individual's measured performance. Nowadays, Deming expresses this in terms of an equation like

$$x + y + [xy] = 8$$

If x is the individual component, y is the system contribution, and [xy] the “interaction” between the individual and the system, how do you extract the ‘x’ component?

13 Institute a vigorous programme of education and self-improvement.

Institute a vigorous programme of education, and encourage self-improvement for everyone. What an organization needs is not just good people; it needs people that are improving with education. Advances in competitive position will have their roots in knowledge.

Deming is, first and foremost, an educator.

**'WE'RE NOT HERE TO LEARN SKILLS;
WE'RE HERE FOR EDUCATION—TO
LEARN THEORY'.**

Training for a skill is finite; it ends when ability has reached a stable state. In comparison, education is never-ending.

**One who concentrates on training is the 'practical man', also defined as one who practices the evils of his forefathers!
There are many practical men. We need them—where would we be without them?**

But all substantial advances contain much that, in the past, was called too theoretical. It is sheer nonsense to pretend, as some governments do, that one can measure the effects or results or rewards of what is spent on education). Education is priceless, beyond calculation. The future, not the past, is important, and education is vital for improving the future.

One of the Obstacles is: 'We installed quality control':

**'YOU DID NOT! YOU CAN INSTALL A
PIECE OF EQUIPMENT BUT YOU
CANNOT INSTALL KNOWLEDGE'.**

A company should take action to aid and encourage the education of its employees at all levels. The company's own courses should no longer be restricted to training, but be broadened to include good educational content.

Companies should also compile lists of courses available locally, prerequisites and other information, and encourage their employees to enrol. Some companies offer to pay for 'courses related to the work'.

Who can judge?

Deming says he would not draw the line anywhere. (Ford exclude basketball— Deming would not!)

Finally, recruitment should not be based just on past records. Look for people who are improving, and are keen to continue improving.

14 Put everyone in the organisation to work to accomplish the transformation. The transformation is everybody's job.

Clearly define top management's permanent commitment to ever-improving quality and productivity, and their obligations to implement all of these principles.

Indeed, it is not enough that top management commit themselves for life to quality and productivity. They must know what it is that they are committed to: that is, what they must do.

Create a structure in top management that will push every day on the preceding 13 Points, and take action in order to accomplish the transformation.

Support is not enough: action is required.

Learn and adopt the new philosophy, and put everyone to work on it and in it.

Some final words from Deming:

“QUALITY IS MADE IN THE BOARDROOM”

“LIMITATIONS ON QUALITY ARE ALSO MADE IN THE BOARDROOM”

“A COMPANY CAN DO WELL WITH POOR MANAGEMENT—FOR A WHILE”

“SURVIVAL IS NOT COMPULSORY!”