W Edwards Deming was an American statistician who was credited with the rise of Japan as a manufacturing nation, and with the invention of Total Quality Management (TQM). Deming went to Japan just after the War to help set up a census of the Japanese population. While he was there, he taught 'statistical process control' to Japanese engineers - a set of techniques which allowed them to manufacture high-quality goods without expensive machinery. In 1960 he was awarded a medal by the Japanese Emperor for his services to that country's industry.

Deming returned to the US and spent some years in obscurity before the publication of his book "Out of the crisis" in 1982. In this book, Deming set out 14 points which, if applied to US manufacturing industry, would he believed, save the US from industrial doom at the hands of the Japanese.

Although Deming does not use the term Total Quality Management in his book, it is credited with launching the movement. Most of the central ideas of TQM are contained in "Out of the crisis".

The 14 points seem at first sight to be a rag-bag of radical ideas, but the key to understanding a number of them lies in Deming's thoughts about variation. Variation was seen by Deming as the disease that threatened US manufacturing. The more variation - in the length of parts supposed to be uniform, in delivery times, in prices, in work practices - the more waste, he reasoned.

From this premise, he set out his 14 points for management, which we have paraphrased here:

1."Create constancy of purpose towards improvement". Replace short-term reaction with long-term planning.

2."Adopt the new philosophy". The implication is that management should actually adopt his philosophy, rather than merely expect the workforce to do so.

3."Cease dependence on inspection". If variation is reduced, there is no need to inspect manufactured items for defects, because there won't be any.

4."Move towards a single supplier for any one item." Multiple suppliers mean variation between feedstocks.

5."Improve constantly and forever". Constantly strive to reduce variation.

6."Institute training on the job". If people are inadequately trained, they will not all work the same way, and this will introduce variation.

7."Institute leadership". Deming makes a distinction between leadership and mere supervision. The latter is quota- and target-based.

8."Drive out fear". Deming sees management by fear as counter- productive in the long term, because it prevents workers from acting in the organization’s best interests.

9."Break down barriers between departments". Another idea central to TQM is the concept of the 'internal customer', that each department serves not the management, but the other departments that use its outputs.

10."Eliminate slogans". Another central TQM idea is that it's not people who make most mistakes - it's the process they are working within. Harassing the workforce without improving the processes they use is counter-productive.

11."Eliminate management by objectives". Deming saw production targets as encouraging the delivery of poor-quality goods.

12."Remove barriers to pride of workmanship". Many of the other problems outlined reduce worker satisfaction.

13."Institute education and self-improvement".

14."The transformation is everyone's job".