

Contents

	Page
Introduction	3.2
Key Concept 1 - Change is required	3.2
Key Concept 2 - All improvement takes place project-by-project	3.3
Key Concept 3 - Changing the job of the manager	3.3
Key Concept 4 - The Shewhart Cycle	3.6
Key Concept 5 - The Joiner Triangle	3.7
Key Concept 6 - The 85-15 Rule	3.9
Key Concept 7 - The old and new ways of viewing an organisation	3.10
Key Concept 8 - Pareto Principle	3.11
Key Concept 9 - The Taguchi Loss Function	3.13
Key Concept 10 - I'd say it all had to do with reducing variation	3.15

Introduction

The Key Concepts underpin everything else in this manual. It's as simple as that.

Many people (even management consultants) confuse key concepts with how to do something. They teach key concepts and expect people to be able to do something different. You won't be able to do anything differently after reading this section, but you should see the links as to what's in the rest of the manual and how it all fits together.

A common problem with 'improvement initiatives' in any organisation is that there is too much focus on doing things, especially the 'tools' and not enough on the underpinning philosophy. True improvement needs to be underpinned by good philosophy.

UIMPROVE is underpinned by the work of the improvement giants, in particular Shewhart, Deming, Juran and Tribus and all of the Key Concepts that follow are the work of them or those who followed and developed their work.

Key Concept 1 - Change is required

"Change is required. There is a process of change just as there is a process of manufacturing, or for growing wheat. How to change is the problem"

This is a quote from Dr W. Edwards Deming. It sums up nicely the fact that change in organisations does not come about through good intentions or wishing for it. Mission statements and grand strategies do not bring about change. A *process* of change is required.

What Deming is saying is that a structured, step-by-step approach is needed just as in manufacturing a car or planting a crop.

UIMPROVE is a *system of improvement*. It is intended to be the production line by which organisations can convert their strategic intentions into real improvement in the workplace.

Deming is credited with the transformation of Japanese industry following World War II. A statistician by trade, he first visited Japan in 1947 to assist with the census. He was invited back in 1950 by the Japanese Union of Scientists and Engineers to lecture on Quality Control. In particular, Deming taught a group of 21 industrialists representing between them 80% of the country's capital. He visited Japan repeatedly over the coming years always teaching the importance of statistical methods and managerial philosophy in quality improvement.

Deming's work was largely ignored back home in the United States until 1980 when a TV programme *If Japan can, why can't we?* was aired highlighting Japanese management practices and mentioning the work of Dr Deming. From then until his death in 1993 Deming worked tirelessly, consulting with many organisations and lecturing around the world. The Deming Prize remains the top industrial award in Japan and his 1982 book *Out of the Crisis* should be compulsory reading for every manager.

Key Concept 2 - All improvement takes place project-by-project

"All improvement takes place project by project and in no other way"

This is a quote from Dr Joseph Juran. It emphasises the importance of taking a systematic, step-by-step approach to improvement. It also links to Key Concept 1 as it provides a clue as to what a 'process of change' might look like.

Intent is converted into change through a series of projects. This process is not just 'bit-by-bit' - it is systematic including prioritisation and the discipline of project work.

The second message is contained in the 'and no other way' phrase. Remember Juran says 'all improvement'. The implication is no projects, no improvement. That's why projects are so important.

Juran also played an influential role in the transformation of Japan after World War II and the later emergence of the quality movement in the West. Like Deming, Juran also lectured in Japan and his 1964 classic *Managerial Breakthrough* described a universal sequence of improvement. It is this concept that underpins the methodologies that are a key component of **UIMPROVE**. To quote Juran again:

"A project is also a way of managerial life"

Key Concept 3 - Changing the job of the manager

*"Workers work in the system.
The job of the manager
is to work on the system
and improve it
with their help"*

This completes the hat-trick of quotes and originates from a third eminent thinker - Myron Tribus.

This Key Concept does not just mean 'listen to the man who does the job', it is much deeper than that.

- Who knows most about the way that work gets done?
The people who do the job
- Who has the least authority to alter the way processes work?
The people who do the job
- Who has the authority to alter the way processes work?
The managers, but they don't know the details of how the job gets done

Key Concept 3 - Changing the job of the manager

Workers work **in** the system. They get the training and tools they are given and do the job as they are trained and told to do it. But it's the workers who know most about **their bit** of the process they do.

The traditional way to manage is to tinker with bits of the job. The **new** job of the manager is to look at the whole process with the help of those people who do the job. That's another reason why projects are so important - they are a means of involving the people who do the job. Traditional management training focuses more on people management skills such as motivation and does not give managers the skills to be able to improve processes.

Myron goes on to say:

The manager should be able to articulate the purpose of the system or systems being managed and therefore be able to tell what constitutes 'improvement'. The manager should be able to define the system and measure the quality, as well as the quantity, of the output.

The people who work in the system are close to the work. They are the only ones who know what is actually going on. They need to understand the purpose of the system and how well it is meeting its goals. They need to be able to communicate their knowledge and suggestions to the manager.

The manager should create something more than just a suggestion box. The manager should create a system which institutionalises continuous improvement.

In a quality company nobody believes the saying 'if it ain't broke, don't fix it'. Instead the managers are leaders in problem identification and problem solution. They train their supervisors and workers to be problem solvers too. They are constantly seeking methods to improve the performance of the system for which they are responsible.

The objective is to institutionalise quality improvement and make it everyone's job. There will be many improvement projects which span several departments and information about these projects will need to be prepared in a suitable form for comprehension and action by the CEO. The form of organisation proposed here does not involve creating a whole new organisation. Rather the objective is to develop a way to assist the line functions in carrying out their quality responsibilities. (1)

This Key Concept lies behind several of the underpinning principles of **UIMPROVE**:

- Involve the people who do the job
- Work on the system to improve it
- Ensure the aim of a system is clearly articulated and everybody who works in it understands this
- Improvement is a never-ending process
- The responsibility for improvement rests with line management, not 'special committees'
- To institutionalise continuous improvement, a system of improvement is needed (see Key Concept 1)

(1) Reproduced with the kind permission of Myron Tribus.

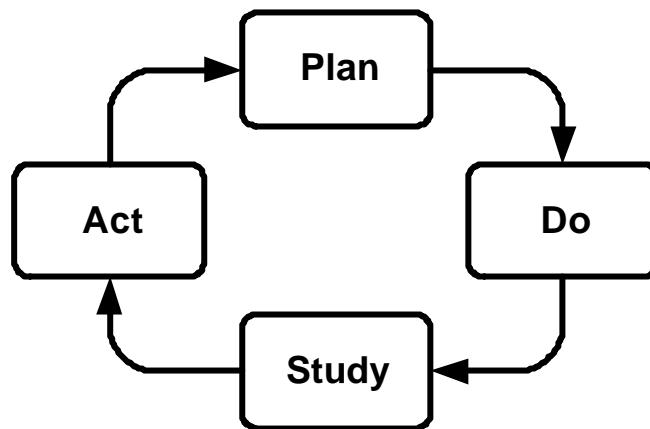
Key Concept 3 - Changing the job of the manager

Myron Tribus has played a unique role in the development of improvement philosophy. Following a distinguished career spanning fields such as engineering and thermo-dynamics including spells with General Electric, Xerox and the Massachusetts Institute of Technology, he was a late comer to but instant adopter of the work of Dr Deming. Myron has produced many excellent papers on the practical issues surrounding organisational improvement. Anyone who has heard him lecture will have been instantly spell bound by his knowledge and passion for the topic and 'suffer no fools' response to questions. In particular, Myron helped implement the principles of improvement in community settings such as policing and schools when the vast bulk of material was still focused on manufacturing.



Myron Tribus and admirers

Key Concept 4 - The Shewhart Cycle



This is the Shewhart Cycle, sometimes referred to as the Deming Cycle. It was actually Dr Deming who developed this model but based it on the work of the great statistician Walter Shewhart who was his teacher and mentor. It was Shewhart who recommended Deming for his first trip to Japan. It was Shewhart who was invited but, as he was in poor health, he suggested his pupil and friend instead.

The Shewhart Cycle tells us to:

- (1) Spend some time carefully planning an action or project.
- (2) Do it - carry it out preferably first as a pilot or on a small scale.
- (3) Study the results - what worked, what didn't? Did you achieve what you set out to do?
- (4) Act on your conclusions. This might mean adopt the change on a permanent basis, modify it and pilot it again or abandon it all together.

Many organisations are in a habit of 'do-do-do' and then put it right when something goes wrong. Even more lacking is 'review' - organisations, teams and individuals tend to move onto the next thing without looking back and therefore don't learn from what went well or what didn't.

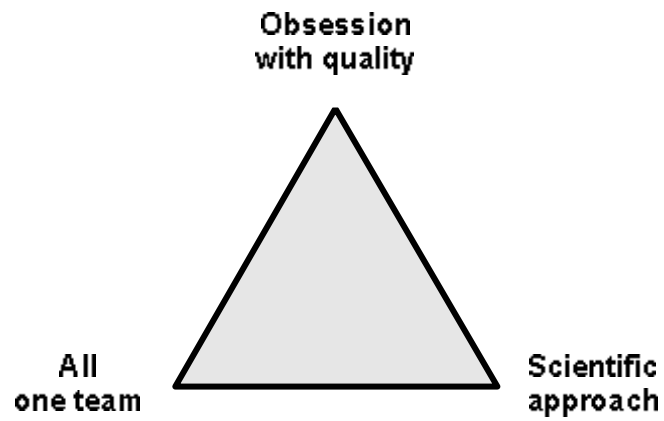
The principle of PDSA expounded in the Shewhart Cycle can be seen throughout **UIMPROVE**. At a high level, the whole concept of Annual Corporate Planning is driven by the revolution of the Shewhart Cycle. Each of the project methodologies incorporates piloting, implementation and review - a lower level but equally important manifestation of this Key Concept in action.

Walter Shewhart was born in Canton, Illinois in March 1891. After receiving a doctorate in physics from the University of California at Berkley, he joined Western Electric, moving to the Bell Telephone Laboratories in New Jersey in 1924. It was around this period that Shewhart developed Statistical Process Control and the Control Chart, the foundations that all improvement philosophy has since been built on. There is only one word to describe his 1931 book *Economic Control of Manufactured Product* - monumental. Not only did Shewhart describe the science of variation but he also advocated the use of simple graphical methods such as Run Charts and Histograms that are taken for granted today.

His second great work *Statistical Method from the Viewpoint of Quality Control* published in 1939 was based upon a series of lectures delivered to the US Department of Agriculture at the invitation of Dr Deming who worked there at the time. It was Dr Deming who edited the content of the lectures into book form.

Key Concept 5 - The Joiner Triangle

This is a model developed by Brian Joiner, an American consultant who has also done a lot of work in developing and applying Dr Deming's theories. It illustrates the importance of having a balance between three elements of improvement.



Key Concept 5 - The Joiner Triangle

Four key points

- (1) Organisations can misinterpret what to do in each corner, the common traps being:
Obsession with quality = glossy mission statements
All one team = send everyone on team building programmes
Scientific approach = lots of figures and league tables

- (2) Organisations can often focus on one corner of the triangle or swing from one to another, flavour-of-the-year style

- (3) A balance between all three is required - like a three legged stool, one missing leg leads to inevitable results

To quote Brian Joiner in his book *Fourth Generation Management*:

The failure to recognise the interdependency of the elements [of the Joiner Triangle] is why so many management initiatives have ultimately failed in the workplace.

Many efforts produced mediocre results at best because the efforts were not directed toward customer-defined issues, and the employees lacked the knowledge and training to use data effectively. A surge in "the customer is no. 1" rhetoric also seldom led to recognisable improvements because the efforts were not driven by data or an understanding of processes; decisions were based on opinion or presumed knowledge; and improvements that were identified were never captured or preserved as *methods* that would reliably achieve the needed results.

Seeing these failures time and time again was what inspired creation of the triangle. the system and measure the quality, as well as the quantity, of the output.

- (4) The Joiner Triangle can apply to whole organisations, departments, project teams, or even people

Key Concept 6 - The 85-15 Rule

*Wherever there is a problem,
85% of the time it will be the process
and not 'the fault' of an individual.*

This is the 85-15 rule. It could be paraphrased as 'don't just focus on the people, understand the processes by which work is accomplished'. Lots of improvement initiatives are motivationally based - work harder, work smarter, be nice to the customers.

These work on the assumption that if only the workers would do their jobs properly then everything would be all right. Performance related pay backs this up - do a good job and get rewarded for it. This approach ignores a couple of important facts. Firstly there is very little that is 100% within the control of the worker. Dr Juran put the figure within worker control at only 15%. Put another way, 85% is outside worker control. Secondly the most important processes cross between departments and will therefore involve several or, more likely, lots of people. Motivating individuals makes no difference. Far better to analyse the process and all the factors affecting it.

Customer care initiatives can sometimes fall into this trap too. Although customer care *skills* are vital, focusing on this one aspect does not improve the overall process.

Where do the figures come from?

We were unable to trace the source of the figures 85-15. While they are widely quoted, the origin (apart from the fact that they are from Juran) was unclear. An e-mailed enquiry to the Juran Institute brought the following response:

Your message was forwarded to me by Carole Wesolowski. I spoke with Dr. Juran today about your question relative to the 85/15 rule. His response is as follows:
I did that research many years ago at Western Electric, but there are no records available. One of the Juran Quality Handbooks may contain the methodology. Look in the index under "Controllability" or "Operator Controllability". Incidentally, 85/15 is a broad average which varies from process to process. Labor intensive processes might be much higher because the rate of human error would be higher than 15%.

Sincerely,

Laura A. Sutherland
Executive Assistant to
Dr. J. M. Juran
Juran Institute, Inc.

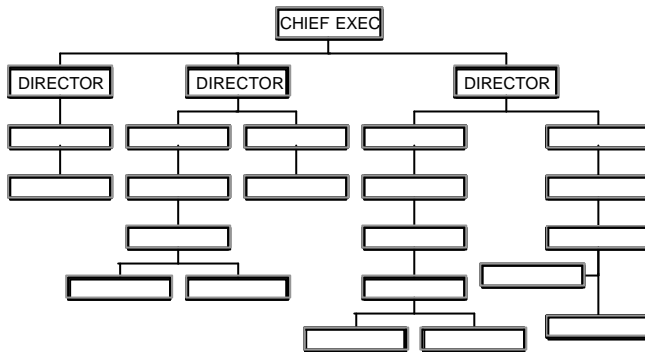
And one more quote from Dr Juran

*"Many companies have been fighting a war
without knowing clearly who is the enemy.
This is no way to fight a war"*

Key Concept 7 - The old and new ways of viewing an organisation

The old way to view (and manage) an organisation

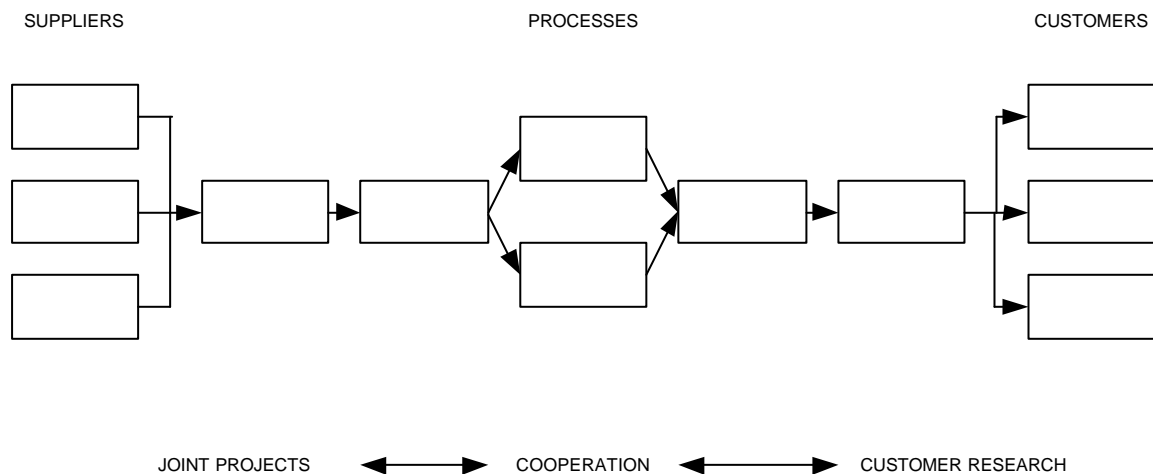
The old way to view an organisation is through the departmental bunkers of the hierarchy chart.



- The customer does not feature on the hierarchy chart. In many organisations most customer contact will take place at the 'lower' levels.
- The most important processes in any organisation cross several departments and therefore require cooperation. As a consequence there is not usually a specific senior manager responsible for a process - it will usually cross the domain of several.

The new way to view (and manage) an organisation

This is a better way to view an organisation. It recognises a number of important truths about the way work really gets done.



Key Concept 8 - Pareto Principle

*"In any series of elements to be controlled,
a selected small fraction, in terms of number of elements,
always accounts for a large fraction, in terms of effect"*

So said Dr Juran in an article in the November 1954 edition of The Management Review. The subject of the article was 'universals in management planning and controlling' which Dr Juran defined as 'any principle which is valid in planning and controlling, no matter what the company, the product, the process or the function'. In 1954 Juran called this universal Pareto's Curve and this was the latest manifestation of an idea he had developed in the late 1940s. By the time Managerial Breakthrough was published in 1964, Juran had renamed it the Pareto Principle and devoted a whole chapter to exploring the significance and application of this.

Today Pareto Principle, along with the graph that takes the same name the Pareto Chart, have become well known. The principle is often referred to as the 80-20 Rule (not to be confused with the 85-15 Rule).

- 20% of your products generate 80% of revenue
- 20% of your customers generate 80% of revenue
- 80% of problems are caused by 20% of the possible causes
- 80% of complaints are about 20% of the total causes of complaint
- You wear 20% of your wardrobe 80% of the time
- 20% of possible projects will create 80% of the possible benefits

Vital Few - Trivial Many

The punch line for managers is simply that they should focus on the 'Vital Few' - the 20% of effort that will result in 80% of the results. To quote Juran in the 1954 article once again:

Now let us consider the principle of separating the vital from the trivial.
The practical expression of this principle is the preparation of a written list of the problems in the order of their importance - the types of accident in order of frequency, the types of defects in order of amount of loss caused, the elements of cost in order of amount, etc.

Such a written list automatically shows the 'vital few' at the head of the list; the 'trivial many' are at the foot of the list.

The vital few must be identified if a programme of improvement, of planning of control is to succeed.

30 years later Juran would change this from 'Vital Few - Trivial Many' to 'Vital Few - *Useful* many'. This change marked the point when Japanese industry had finished working on the Vital Few and moved on to the Trivial Many to discover that several trivials become useful. For most Western managers in the 21st Century, we can make a safe assumption that sticking to the Vital Few will keep us busy for the foreseeable future.

Key Concept 8 - Pareto Principle

Pareto in practice

The Pareto principle runs through **UIMPROVE**, in particular:

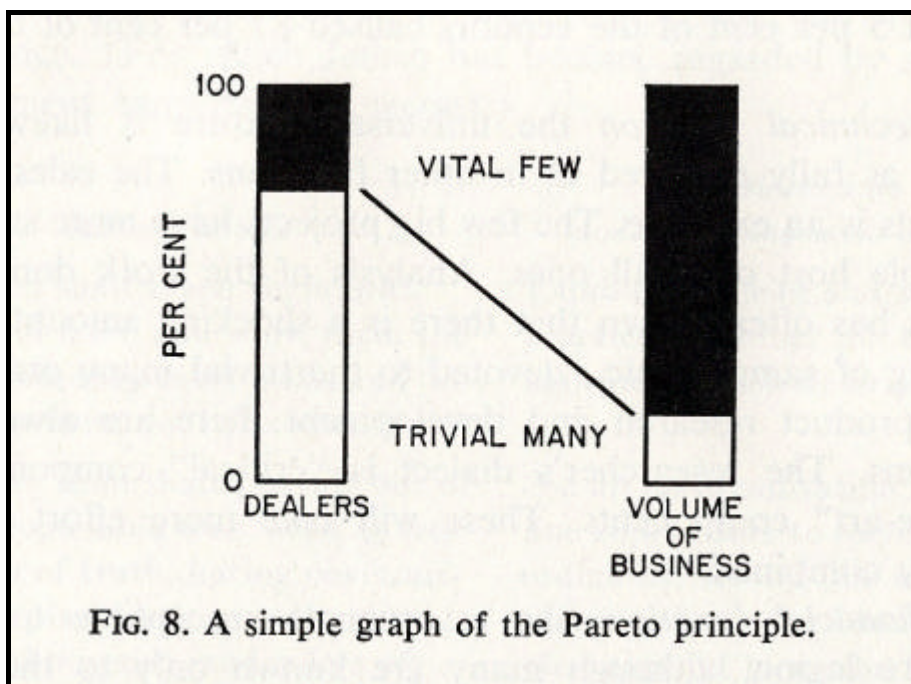
- (1) Managers should always use 'Pareto thinking' - spend time and effort on the Vital Few
- (2) In the selection of projects
- (3) In data analysis

A final quote from Dr Juran:

"The utter simplicity of the Pareto concept makes it prone to be underestimated as a tool for quality improvement"

Vilfredo Pareto

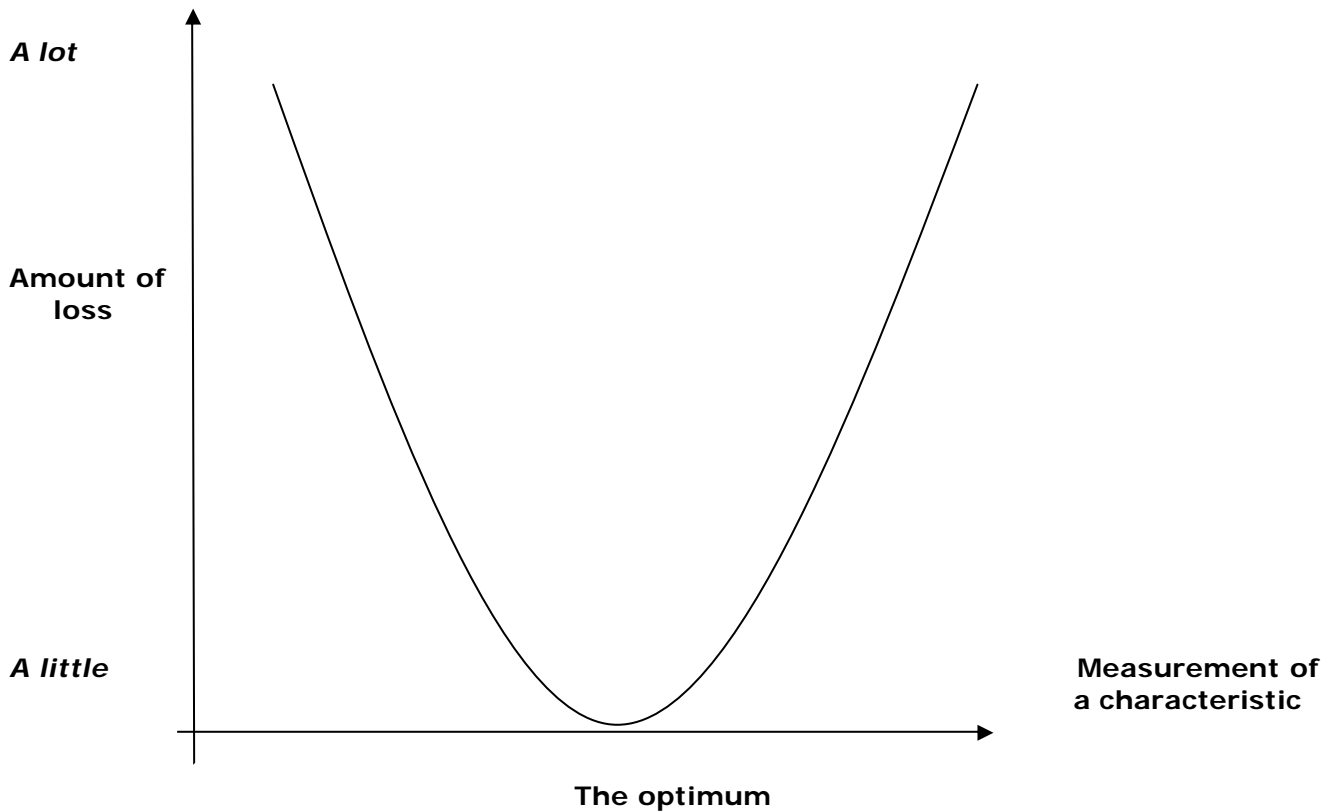
Juran named Pareto Principle after Vilfredo Pareto, a 19th Century Italian economist who conducted a study of the distribution of wealth and concluded that 20% of the population had 80% of the wealth.



Key Concept 9 - The Taguchi Loss Function

"The supposition that everything is all right inside the specifications and all wrong outside does not correspond to this world. A better description of the world is the Taguchi Loss Function in which there is minimum loss at the nominal value, and an ever-increasing loss with departure either way from the nominal value"

Genichi Taguchi presented his Loss Function in Tokyo in 1960. Dr Deming was present and the quote above is from Out of the Crisis. The Taguchi Loss Function is most commonly shown as below:



The Loss Function tells us that the output of a process has an optimum (or nominal) value. Any performance greater or less than that optimum value creates 'loss'. The role of management is to continually reduce variation to as close to the optimum value as is economically practical.

Key Concept 9 - The Taguchi Loss Function

An example

We are all familiar with the dreaded call centre. The first hurdle is to get your call answered. Smart managers have realised through customer research that people don't like the phone to ring for too long before their call is answered. There are two potential problems:

- (1) There is insufficient capacity in the process - too few operators available to meet the number of incoming calls. Therefore when a customer calls, the phone rings and rings. Loss is created in the form of customer dissatisfaction and potentially lost business.
- (2) There is too much capacity in the process - operators are idle because there are more operators than calls coming in. Loss is created in the form of staff costs.

The nature of the loss is not an absolute value. The Loss Function tells us that the further we move away from the optimum, the greater the loss. One idle member of staff creates minimal loss. Two idle members of staff creates more loss and so on.

On the other side of the Loss Function, a call answered within, say, three rings creates no loss. But what about 10 rings, or 20, or 50? The longer it takes to answer a call, the greater the loss.

This is an interesting example as to understand the issue we must also understand the customer. The Kano Model for analysis of customer needs discussed later in the manual helps with this.

The traditional management response is to implement targets. All calls must be answered within five rings. This distorts the nature of the Loss Function. A better approach is to seek to understand the customer to establish the optimum value and then continuously improve the process to as close to the optimum as possible. To quote Dr Deming:

*"The most important use of a loss function
is to help us move from a world of specifications (meet specifications)
to continual reduction of variation about the target
through improvement of processes"*

Another example

Anyone who stays in hotels regularly will have noticed many hotels that offer room service breakfast no longer ask for the specific time you would like your breakfast - instead they offer a series of half-hourly slots, i.e. 06.00-06.30, 06.30-07.00 etc. Say you need to check out of the hotel at 06.45, 06.15 is a sensible time to order breakfast. However this means you have no option but to be ready to receive your breakfast at 06.00. But your breakfast may arrive at 06.30 meaning you have been waiting for 30 minutes and now have to rush. Artificial loss has been imposed by setting arbitrary half-hourly slots for the convenience of the service provider, not the customer.

A better way would be to study the process to anticipate peaks and troughs in demand and gear up to meet these.

Key Concept 10 - I'd say it all had to do with reducing variation

*"If I had to reduce my message for management
to just a few words,
I'd say it all had to do with reducing variation"*

This is our final quote (for now) from Dr Deming. It emphasises the importance Dr Deming places on the reduction of variation in processes as an underpinning principle of improvement. All efforts to improve quality hinge on this concept. The less a product or service varies, the more reliable it becomes. The more reliable a service or product becomes, the more satisfied the customer.

The most effective way of identifying and then controlling variation in a process is Statistical Process Control as developed by Walter Shewhart who discovered that there are two distinct types of variation.

Common Cause Variation

Common Cause Variation is characterised by a stable and consistent pattern of variation over time. It is predictable and can only be improved by setting up improvement projects to study the process, identify causes of variation and then reduce them.

Special Cause Variation

Special Cause Variation is characterised by an unpredictable pattern of variation, the causes of which can usually be easily identified as they are often caused by factors outside of the process as it normally works.

What to do to reduce variation

Shewhart discovered that if you treat one type of variation as though it is the other, you are only going to make things worse. Therefore the first step in improvement is to measure the process to see how much and what type of variation there is.

