100 YEARS of the CQI

1919 — The Institute is established as the TECHNICAL INSPECTION ASSOCIATION (TIA) by members of the Inspection Department at the MINISTRY of MUNITIONS.

1922 — The TIA reforms as the INSTITUTION of ENGINEERING INSPECTION (IEI) with a mandate to promote efficiency and commerce through QUALITY ASSURANCE.

1972 — The IEI changes its name to the INSTITUTE of QUALITY ASSURANCE (IQA)

1981 — The IQA forms a corporate membership arm with the BRITISH QUALITY ASSOCIATION.

1984 — The REGISTER of CERTIFIED AUDITORS (RCA) is established as the world's first register to train and certify quality management systems auditors to advance the UK's push for quality.

1988 — The RCA becomes the INTERNATIONAL REGISTER of CERTIFICATED AUDITORS (IRCA) in recognition of the global nature of accredited certification and the growth of auditor training and certification worldwide.

1989 — The IQA celebrates its first WORLD QUALITY DAY on 9 NOVEMBER.

1991 — The IQA establishes its first international branch in Hong Kong.

2001 — The IQA is awarded a Royal Charter.

2007 — The IQA starts operating as the CHARTERED QUALITY INSTITUTE (CQI).

2014 — The CQI publishes the CQI COMPETENCY FRAMEWORK.

2017 — The CQI launches the INTERNATIONAL QUALITY AWARDS.

2019 — The CQI celebrates 100 years of leading the quality profession.

Illustration: Liz Kay

As part of the CQI's centenary celebrations, *Quality World* will be looking at the past 100 years, focusing on each decade, to provide readers with an example of a major development that influenced the quality profession.

CQI | IRCA
LEADING QUALITY FOR 100 YEARS

The 1920s
The Birth of
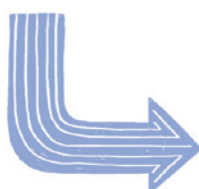### STATISTICAL PROCESS CONTROL

16 MAY 1924

In the early 1920's, WALTER A SHEWHART, a physicist, engineer and statistician from New Canton, Illinois, USA, prepared a notable memorandum which described the essential principles of **statistical quality control (SQC)** and which also contained a simple control chart, for Bell Labs, where he was working at the time. Shewhart's work emphasised the importance of reducing variation in a manufacturing process and of understanding that variation in production processes results in variation in final products.

1925

Statistician RONALD FISHER published the classic and influential book on statistical methods, *Statistical Methods for Research Workers.*

1927

Quality guru W EDWARDS DEMING began applying Shewhart's techniques more widely, including to non-manufacturing processes, and particularly to clerical, administrative and management activities.

In the late 1930s/early 1940s, Deming applied SPC principles to his work at the US Department of Agriculture. Around this time he also started to run courses for engineers and designers, including his and Shewhart's evolving **statistical process control (SPC)** methods. After the war he worked in Japan, helping industrial managers and workers to understand the value of statistical methods in improving quality.
He returned to the US in 1980 and worked extensively in the motor industry.
Shewhart's work developing SQC cast a long shadow, influencing the work of Deming, and other quality gurus such as Taiichi Ohno and Shigeo Shingo in Japan and Professor John Oakland in the UK.

Shewart's work on SQC was a significant contributor to the later development of **Total Quality Management (TQM)**, developed in the late 1970s and 1980s. Additionally, **Six Sigma** was a further development of statistical approaches and methods to reduce variation and improve quality.
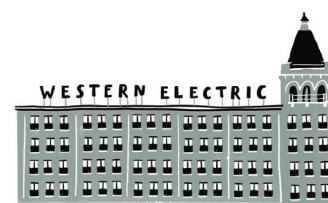
Illustration: Liz Kay

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LEADING QUALITY FOR 100 YEARS

1930s
A TIME OF INNOVATION & TECHNOLOGICAL ADVANCEMENTS

WESTERN ELECTRIC

Between 1924 to 1932, Australian-born sociologist Elton Mayo conducted a series of experiments at Hawthorne Works, a Western Electric factory in Chicago, USA. Western Electric had commissioned a study to discover whether the level of light in their building affected employee productivity. Two groups of workers were used as test subjects.

Lighting for the first group was improved substantially while lighting stayed the same for the second group. The study found that the productivity of the group of workers with better lighting had increased dramatically.

During the Great Depression, workers' conditions also changed in other ways: reducing working hours and introducing rest breaks. Where changes were made, the productivity improved. The study also found that employee performance improved when the lighting was dimmed. While this was unexpected, Mayo concluded that this was the result of seeing someone concerned about the workplace and being under observation.

Mayo also conducted a series of interviews with employees in which they were invited to express their views on their working experience. Mayo concluded that supervisors needed training in understanding the personal problems of workers, and also in listening and interviewing techniques. When analysing the experiments in 1955, researcher Henry A. Landsberger coined the term 'the Hawthorne effect', after the name of the factory.

ADVANCES in MANUFACTURING, PRODUCTION & PROCESS

Many of the sectors in which many quality professionals work today were being shaped in the 1930s.

HEALTHCARE

The first ever blood bank opened in 1937 at the Cook County Hospital in Chicago. The blood bank was founded by Dr Bernard Fantus, an inventive Cook County Hospital physician. It helped to facilitate 1,354 blood transfusions in its first year. The model for this blood bank was adopted around the country and throughout the world.

TECHNOLOGY

Physicist Sir Robert Alexander Watson-Watt discovered it would be possible to detect aircraft by means of radio waves. Radar was introduced to warfare by the British and tipped the scales in the UK's favour at at the Battle Britain, during World War II.
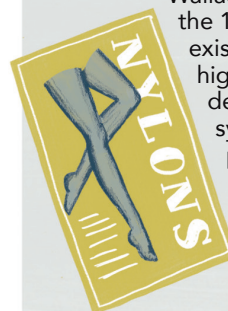
AGRICULTURE

Technological advances boosted agricultural productivity. For example, tractors were built with diesel engines, and advances in steel manufacturing meant there was stronger and cheaper steel available for agricultural equipment.

CLOTHING

NYLONS

Wallace H. Carothers' research in the 1930s at DuPont confirmed the existence of molecules of extremely high molecular weight. This led to the development of nylon, the first totally synthetic fibre used in consumer products. A nylon patent was issued in 1938 and DuPont opened its nylon plant in Seaford, Delaware, USA. Nearly 800,000 pairs of nylon stockings were sold the first day they were introduced in 1940.
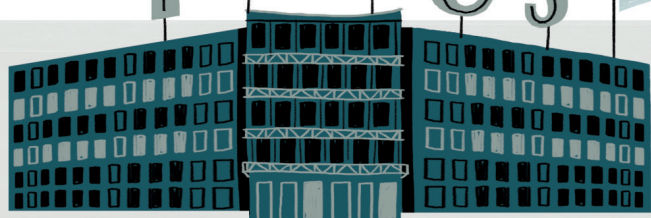
Illustration: Liz Kay

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1940s

The INTERNATIONAL ORGANIZATION for STANDARDIZATION (ISO)

The International Organization for Standardization was established in 1947, in London, by delegates from 25 countries. ISO is currently the world's largest developer of voluntary international standards.

ISO is based in Geneva, Switzerland, and has published over 22,654 international standards covering almost every industry and has members from 163 countries.

65 delegates from 25 countries meet in London to discuss the future of international standardisation.

ISO moves into an office in Geneva, called the Central Secretariat. In the early 1950s the Central Secretariat had five members of staff.

1946 — **1947** — **1949**

ISO officially comes into existence with 67 technical committees (groups of experts focusing on a specific subject).

The DEVELOPMENT of STANDARDS

1951 — ISO publishes its first ISO standard (called Recommendations at this time) – ISO/R 1:1951 Standard reference temperature for industrial length measurements.

1960 — ISO publishes the standard ISO 31 on quantities and units (which has since been replaced by ISO 80000-1:2019 – Quantities and units).

1961 — DEVCO, a committee for developing country matters, is established.

1968 — Correspondent membership allows developing countries to be informed of International Standardization work without the full costs of ISO membership.

1971 — ISO creates its first two technical committees in the environmental field: air quality and water quality.

1987 — ISO publishes its first quality management standard. Standards in the ISO 9000 family have gone on to become some of the most well-known standards.

2010 — ISO launches ISO 26000, the first International Standard providing guidelines for social responsibility.

TODAY

ISO has 161 national standards bodies, 786 technical committees and subcommittees for standards development, and ISO members across the globe. The organisation says: "We bring together experts to share knowledge and develop International Standards that provide solutions to global challenges".

Illustration: Liz Kay

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1950s
W. EDWARD DEMING'S INFLUENCE IN JAPAN

W EDWARDS DEMING worked as a quality expert for the Bureau of the Census from 1939 to 1946, where he managed 450 people and helped to develop the methods, procedures and processes used by the bureau. Deming also served as a consultant to the Secretary of War, where he taught statistical process control to workers involved in military production.
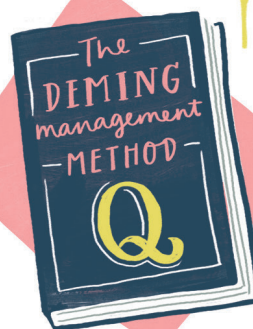
1950

In 1950, Deming received an invitation from the Union of Japanese Scientists and Engineers (JUSE) to teach the application of statistics to quality improvement. Thus, began Deming's journey to help Japan rebuild its industries after World War II. Deming spoke to 21 Japanese CEOs in 1950 and the later founding of the Deming Prize by JUSE, which was awarded to a statistician for their contribution to statistical theory, shows the impact he made and the respect he generated.

At the same time, US companies were losing their wartime focus on quality to take advantage of their capacity to supply in a sellers' market.

In the Deming approach, management is responsible for the whole system, which includes people, methods, processes and suppliers. The approach views an organisation as a whole system, focused on meeting the needs of the customer, which means quality is the central value. Improving quality reduces waste and hence improves productivity. As a result, Deming Management is just as important today, as customers have new priorities and the world is moving faster under the influence of rapidly developing information and technology.

TOYOTA MOTOR CORPORATION

Toyota's management system was designed based on Deming's ideas. The company introduced statistical quality control in 1949 and conducted Total Quality Management (TQM) based on the unchanging principles of 'customer first', kaizen (continual improvement) and 'total participation'. The Creative Idea Suggestion System was also launched in 1951 by Eiji Toyoda, Managing Director at Toyota, to support improvement activities through opinions not only from the factory, but also from management.

In 1965, the company won the Deming Application Prize by proving how it had built quality into its processes. Shoichiro Toyoda, Honorary Chairman and director of Toyota, said:

"There is not a day I don't think about what Dr Deming meant to us. Deming is the core of our management."

Illustration: Liz Kay

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1960s
QUALITY EVOLVES — in Japan —

KAIZEN

The concept of Kaizen was developed in Japan in the 1960s. Kaizen is a Japanese word that means change for the better and involves everyone in the organisation. It is aimed at sustainable continuous improvement, focusing on the elimination of waste in all systems and processes.

1962

In 1962, Dr Ishikawa, a Japanese organisational theorist, and Professor at the Faculty of Engineering at the University of Tokyo, develops the concept of quality circles. Quality circles are a method of quality management in which employees work together to suggest improvements.

DR. ISHIKAWA

GUIDE TO Quality CONTROL
Dr Ishikawa

Dr Ishikawa publishes the Guide to Quality Control.

1968

1969

Dr Ishikawa emphasises the use of Seven Quality Tools: Check Sheet, Control Chart, Run Chart, Pareto Chart, Histogram, Fishbone Diagram, Scatter Diagram.

The American Society for Quality (ASQC) co-sponsors the first International Congress in Quality Control, hosted by the Union of Japanese Scientists and Engineers in Tokyo.

TOTAL QUALITY MANAGEMENT

(TQM) describes a management approach to long-term success through customer satisfaction. In a TQM effort, all members of an organisation participate in improving processes, products, services, and the culture in which they work.

"Quality control starts and ends with training"

DR. ISHIKAWA

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LEADING QUALITY FOR 100 YEARS

1970s
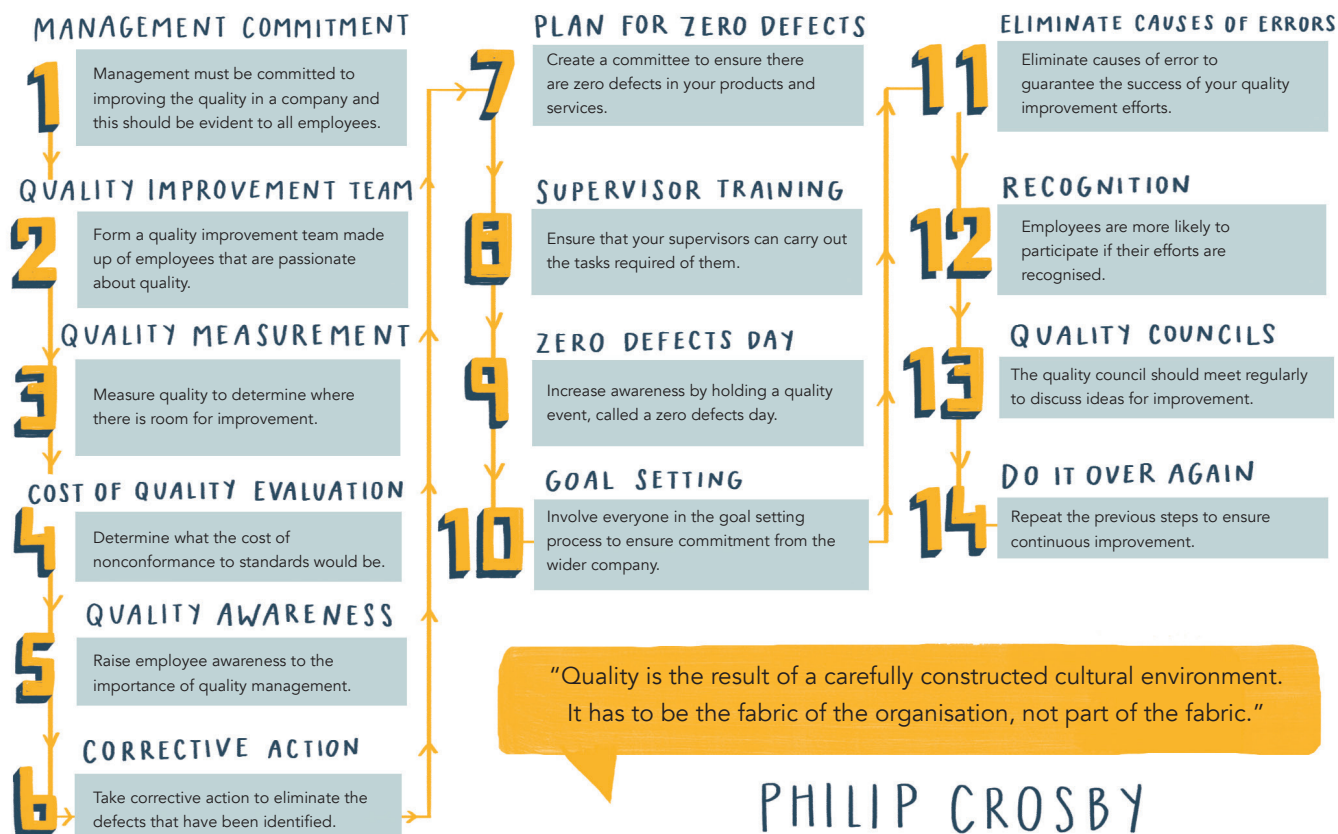
QUALITY IS FREE is published by PHILIP CROSBY

Philip Bayard Crosby (1926-2001) was a quality professional, consultant and author who wrote *Quality is Free* in 1979. He established practical ideas to explain and communicate quality improvement practices.

Crosby's career began in 1952, after serving in World War II and Korea, working on the assembly line at Crosley Corporation. He then became a senior quality engineer at the Martin Company where he developed the Zero Defects concept. He went on to found Philip Crosby Associates and taught management how to establish a preventative culture to get things done right the first time.

He was seen by global corporations as an innovator who changed the way organisations achieved efficiency, reliability and profitability.

QUALITY IS FREE
Philip Crosby

Crosby's approach to quality, as seen in *Quality is Free*, has been summarised into 14 steps:

MANAGEMENT COMMITMENT
1 Management must be committed to improving the quality in a company and this should be evident to all employees.

QUALITY IMPROVEMENT TEAM
2 Form a quality improvement team made up of employees that are passionate about quality.

QUALITY MEASUREMENT
3 Measure quality to determine where there is room for improvement.

COST OF QUALITY EVALUATION
4 Determine what the cost of nonconformance to standards would be.

QUALITY AWARENESS
5 Raise employee awareness to the importance of quality management.

CORRECTIVE ACTION
6 Take corrective action to eliminate the defects that have been identified.

PLAN FOR ZERO DEFECTS
7 Create a committee to ensure there are zero defects in your products and services.

SUPERVISOR TRAINING
8 Ensure that your supervisors can carry out the tasks required of them.

ZERO DEFECTS DAY
9 Increase awareness by holding a quality event, called a zero defects day.

GOAL SETTING
10 Involve everyone in the goal setting process to ensure commitment from the wider company.

ELIMINATE CAUSES OF ERRORS
11 Eliminate causes of error to guarantee the success of your quality improvement efforts.

RECOGNITION
12 Employees are more likely to participate if their efforts are recognised.

QUALITY COUNCILS
13 The quality council should meet regularly to discuss ideas for improvement.

DO IT OVER AGAIN
14 Repeat the previous steps to ensure continuous improvement.

"Quality is the result of a carefully constructed cultural environment. It has to be the fabric of the organisation, not part of the fabric."

PHILIP CROSBY

Illustration: Liz Kay

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LEADING QUALITY FOR 100 YEARS

1980s
TOTAL QUALITY MANAGEMENT

In the 1980s, Japan was leading the way in Total Quality Control, which became Total Quality Management (TQM) in the West. The country's organisations were using Deming's teachings to improve their processes and, as a result, they gained competitive advantage through selling high-quality products at low prices. Soon the rest of the world also adopted Deming's teachings, and the focus moved from product inspection to process improvement.

KEY DATES

1980
NBC News broadcast a TV documentary entitled '*If Japan Can… Why Can't We?*' in June 1980. This asked why Japan had higher quality and productivity than the USA, and introduced the work of Dr W Edwards Deming – recognising his contribution to the development of Japanese quality and productivity over the previous 30 years. Deming's phone began to ring, and continued to, as American companies sought his help.

1982
In this year, Deming published his book *Quality, Productivity, and Competitive Position*, in which he first suggested that organisations should understand the importance of good quality products and services for their long-term financial stability. He argued that if top management adhered to such a philosophy, it would transform their businesses, to being healthier and more profitable.

DEMING'S 14 POINTS

Deming advocated the use of statistics, so that managers know exactly what their problems are and can act to fix them.

1. Constancy of purpose
2. Learn and adopt the new philosophy
3. Cease dependence on mass inspection
4. End lowest tender contracts
5. Constantly improve the system
6. Institute training
7. Institute leadership
8. Drive out fear
9. Break down barriers
10. Eliminate exhortations
11. Eliminate arbitrary numerical targets
12. Permit pride in workmanship
13. Encourage education
14. Top management commitment and action

WHAT IS TQM?

Total Quality Management is a framework that helps organisations in all sectors succeed by involving all stakeholders in improving quality beyond customers' basic expectations. TQM helps organisations to focus on continuous improvement over a long period of time, rather than only considering short-term financial gains.

Illustration: Liz Kay

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1990s

CHANGE MANAGEMENT

John Kotter and the human side of change management

Change management from an organisational perspective refers to any event or programme a business undertakes that causes major disruption to daily operations (CIO.com).

In the 1990s, John Kotter, Emeritus Professor in organisational science and change management at Harvard University, emphasised the human side of change in change management.
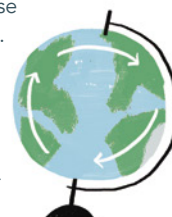
Kotter created an eight-step process for understanding and managing change in an article for *Harvard Business Review* in 1996, and later in his book, *Leading Change*.

Food and beverage organisation PepsiCo worked with consultancy firm TMC to ensure all employees – all 90,000 – treated each other with respect and fairness, demonstrating a sensitivity to difference and appreciation for diverse perspectives and opinions.

Due to the significant complexity of the effort, TMC adapted John Kotter's 8-Step Process for Leading Change to create a strategy for building a globally inclusive and unifying organisational culture. For the full report, go to bit.ly/2TjYHNS.

1 CREATE A SENSE OF URGENCY
Help others see the need for change through a bold opportunity statement that communicates the importance of acting immediately.

2 BUILD A GUIDING COALITION
A volunteer army needs a coalition of effective people to guide it, coordinate it and communicate its activities.

3 FORM A STRATEGIC VISION AND INITIATIVES
Clarify how the future will be different from the past and how you can make that future a reality through initiatives linked directly to the vision.

4 ENLIST A VOLUNTEER ARMY
Large-scale change can only occur when massive numbers of people rally around a common opportunity.

5 ENABLE ACTION BY REMOVING BARRIERS
Removing barriers, such as inefficient processes, provides the freedom necessary to work across silos and generate real impact.

6 GENERATE SHORT-TERM WINS
Wins must be recognised, collected and communicated to track progress and energise volunteers.

7 SUSTAIN ACCELERATION
Press harder after the first successes. Your increasing credibility can improve systems, structures and policies.

8 INSTITUTE CHANGE
Articulate the connections between the new behaviours and organisational success, making sure they continue until they become strong enough to replace old habits.

"Management is a set of processes that can keep a complicated system of people and technology running smoothly. The most important aspects of management include planning, budgeting, organising, staffing, controlling and problem solving. Leadership is a set of processes that creates organisations in the first place or adapts them to significantly changing circumstances. Leadership defines what the future should look like, aligns people with that vision and inspires them to make it happen despite the obstacles."

LEADING CHANGE
JOHN P. KOTTER

Illustration: Liz Kay

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AGILE METHODOLOGIES

2000s

- Agile refers to an organisation's ability to successfully respond to changes in an uncertain and turbulent environment. This idea is the cornerstone of the Agile Manifesto (The Manifesto for Agile Software Development).
- Four core values place more importance on individuals and interactions over processes and tools, working software over comprehensive documentation, customer collaboration over contract negotiation, and responding to change over following a plan.
- The Agile Manifesto also has 12 key principles for better ways of developing software.
- While Agile and its manifesto were created to address issues in software development, its values and principles have important applications in project management, business analysis and making workplaces more efficient.

2001

In February 2001, 17 software practitioners created the Agile Manifesto, at a ski resort in Utah, US. The group wanted to establish common principles at a time when software development involved the arbitrary mixing of old and new methodologies. Frameworks such as Scrum, Extreme Programming and Feature-Driven Development were all gradually being adopted, but there was no consistent philosophy to anchor the different approaches.

In identifying commonalities and differences in new and existing methodologies, the group came up with the Agile Manifesto's four key principles, establishing a philosophical foundation for software development. It placed emphasis on people over processes and on being flexible to change.

Agile Alliance

The group named itself the Agile Alliance. It included Martin Fowler, Chief Scientist at ThoughtWorks; Dave Thomas (quoted, right), co-author of *The Pragmatic Programmer*; and Jim Highsmith, Executive Consultant at ThoughtWorks.

Within a few months, 12 more principles for software development were added to the manifesto. It was posted online at agilemanifesto.org and went on to be signed by thousands of people. The document has been translated into 68 languages.

Several members of the group established a non-profit organisation, also named Agile Alliance, to create a permanent base to support professionals who advocate Agile values. The organisation hosts events and conferences, and its corporate members include Lockheed Martin, HP and Capital One. Its affiliates include Agile Alliance Brazil and Agile Alliance New Zealand.

Since those early days, people have interpreted the Agile Manifesto beyond software development and the values and principles have been applied in the wider context of "business agility" to all kinds of product developments, services and functions.

"I think the Agile Manifesto has helped teams around the world rethink their priorities and, in the process, has helped re-humanise software development"

DAVE THOMAS