In the first part of the History of Quality Management (QM) we saw how QM developed out of World War One to ensure finished products were of sufficient quality, and how, later, focus shifted to pre-production checks (Part 1 is available on the PRI website).

Since then, QM has continued to develop and techniques are now applied widely by private sector manufacturing and service businesses as well as by public and third sector organizations. Some popular modern QM techniques include:

i. Kansei engineering: This technique aims to incorporate the emotional and psychological requirements of the customer into the features of a product or service. As such, Kansei engineering uses statistical techniques to enable customers’ psychological requirements to inform product parameters. Statistical techniques are also used to refine productive processes so that deviations from those parameters are minimized.

ii. Taguchi methods: A set of QM techniques focusing on product and service design quality. The rationale for these techniques was the belief that it is more cost-effective to design products and services effectively than to correct defects during or after the production process.

iii. Six Sigma: This technique was developed by Motorola in 1986 and aims for the complete elimination of the causes of defects and product variation through the application of statistical methods. Six Sigma techniques have four principal characteristics:
   (i) Focus on quantifying the impact that process improvements have on financial returns;
   (ii) Emphasis on the necessity of active leadership by senior management to drive process improvements;
   (iii) Integration of human elements, such as workplace culture and customer relations, and process elements like process management and statistical analysis to achieve process improvements;
   (iv) Use of a defined set of tools to improve processes in a sequential and consistent manner.

From its beginnings in the manufacturing sector, Six Sigma is now applied widely in private sector services, and in the public and third sectors.

iv. Continuous Improvement: This set of techniques emphasizes an employee-led gradual improvement in productive techniques. This purports to deliver three principal benefits:
   (i) Ongoing incremental changes that are unlikely to disrupt product or service production to the same extent as larger (such as R&D-based) changes;
   (ii) Often less expensive than changes arising from specific (such as R&D or external consultancy-based) QM initiatives, because such changes flow from the day-to-day work of employees; and
   (iii) Continuous improvement mechanisms that identify improvements which other QM techniques may overlook, because employees identify the improvements which Management could miss.

v. Lean: this is a comprehensive set of QM techniques aimed at eliminating wasteful or inefficient steps in the production process of a good or service. The process also focuses on increasing the flow and synergies between steps, thereby reducing their overall costs.

Toyota was the first proponent of Lean, defining the approach as having five principal components:
   (i) Specification of the value desired;
   (ii) Identification of the value stream and challenging the wasteful steps;
(iii) Continuous product flow;
(iv) Introduction of pull between all steps; and
(v) Continuous falls in the time and information needed to serve the customers.

Since then, experts have identified two principal aims of Lean, now accepted as conventional wisdom, as being:
(i) To deliver consistent value to the customer while reducing the costs of productive processes, thereby raising profits; and
(ii) To increase the final value the customer receives.

What does this have to do with Nadcap?

Nadcap: This program was established by the aerospace industry in 1990. Nadcap improves quality within special processes, products or systems while minimizing customer workload where possible. Administered by PRI, the program is managed by the aerospace industry itself. This is done through a systematic approach:

(i) Prime Subscribers and Suppliers work together to create checklists based on customer requirements and industry standards.
(ii) Suppliers are audited every year (or up to every two years depending on previous audit results) to ensure they conform to their customers requirements.

(iii) The audit results are passed to PRI Staff Engineers who review the non-conformances (NCRs) and work with the Suppliers to resolve them.
(iv) For each special process, product or system audited by Nadcap, there is a Task Group made up of technical experts from Nadcap subscribing aerospace Prime contractors and Suppliers. After the Staff Engineer review process Prime members vote on whether audits will result in an accreditation or not.
(v) Nadcap meetings take place three times a year in locations around the world. They are free and open to all Nadcap stakeholders and interested parties. These are forums where program developments and technical discussions take place.
(vi) Ultimately industry representatives make all the key decisions regarding which processes require audits and which Suppliers receive accreditation.

A 2010 PRI survey of over 1000 Nadcap accredited Suppliers around the world shows;
(i) 60% say Nadcap has improved standardization.
(ii) 44% say Nadcap has helped reduce escapes.
(iii) 41% say Nadcap has helped reduce rework.
(iv) 35% say Nadcap has helped reduce scrap rates.

Further to this, a 2011 International Accreditation Forum (IAF) survey of 4000 respondents showed that 80% believe certification adds value to their organization.

This history of QM briefly shows why quality is so important in modern business. It can be easy to undervalue the importance of having a good QM system in place when working with a tight budget or quick turnaround, but these factors will be forgotten quickly. What will remain after the cost and time is forgotten is the reputation for quality.

This PRI Perspective has been created using information provided by the Chartered Quality Institute. For more information, visit their website at www.thecqi.org

For more information on Nadcap, visit the PRI website at www.p-r-i.org/Nadcap