

History and best practice of the standard for quality management systems DIN EN ISO 9001: 2015

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In this working paper, which was created at the Faculty of Communication and Environment of the Rhine-Waal University of Applied Sciences, the legal foundations and current cases are discussed and exact sources are given.

1. Definition of quality and quality management

Quality stands broadly for the nature of an object or process, and the term can be used in both negative and positive terms. In order to standardize the term quality, new norms and standards have been and are constantly being developed, including ISO standards. These uniform standards are measurable and internationally applicable. With the help of these tools, it is possible to determine in general terms whether a company and its processes or products comply with the standard and whether it exhibits a certain level of quality. The concept of quality is therefore a condition that is difficult to measure and can acquire a certain tangibility through a standard. So standards create a uniform perception about how to measure the concept of quality and ensure that the quality of a process or a product is measured correctly and how it is defined. Quality has changed constantly over the years, as have the demands of customers. Customer requirements are growing, and quality must therefore also increase in order to satisfy customers in the long term. In addition, the market is constantly growing, making it difficult for companies to grow and generate customers.¹

But what exactly does quality have to do with quality management?

Quality management is used in a wide variety of companies around the world. The goal of these companies is to achieve a constant quality for their products or services. By planning, controlling, monitoring, and improving both internal and external processes, the company can achieve this. However, quality also varies from company to company, cheaper products may have lower quality but as long as the

¹ Giebel, Michael. *Wertsteigerung durch Qualitätsmanagement*. 2011, kassel university press, p.14

company achieves its goals it operates good quality management. Quality management is the oldest management system and has developed during the industrialization process, evolving year by year and constantly being adapted and improved by new tools. Quality management today means not only to have the best quality but also to pay special attention to processes in order to be able to free them efficiently from errors and to be successful in the long term.²

2. The history of quality management

Quality management as we know it today was invented and put into practice a long time ago. Trade was already practiced more than a hundred years ago. Trade was initially limited to the exchange of goods and trades, but later became the trade we know today through a kind of payment with goods for other goods. As trade developed throughout the world, more and more attention was paid to the "quality" of goods in production as well as services. In production, therefore, from this point on, attention was paid to the safety of quality in production.³

From the 20th century onwards, Henry Ford and Frederick Winslow Taylor in particular became the pioneers of quality management. Frederick Winslow Taylor developed what is known as scientific management between the 18th and 19th centuries. Scientific management describes the process control of work processes that are to be simplified by previously compiled specifications. Scientific management also provided for a strict division of labor and structured management by an inspector who would look for problems in the processes so that they could be improved.⁴

In 1924, Walter A. Shewhart developed another quality control system, the quality control chart. With the help of the quality control chart, companies were able to examine processes by means of spot checks and to crystallize possible faults.

² Giebel, Michael. *Wertsteigerung durch Qualitätsmanagement*. 2011, kassel university press, pp.15

³ Kamiske, Gerd F. and Brauer, Jörg-Peter, *Qualitätsmanagement von A – Z, Wichtige Begriffe Des Qualitätsmanagements und Ihre Bedeutung*. 7th ed. 2016.

⁴ Strutz, Hans. *Handbuch Personalmarketing*. Wiesbaden, 2014, p. 583

Between 1900 and 1930, W. Edwards Deming developed the so-called Deming cycle, also known as the PDCA cycle, on the basis of the physicist Walter A. Shewhart. This method is still used today in the improvement and recognition of quality processes.⁵

In the 1960s, the first "zero defect" programs were introduced in the defense industry in America. These programs were designed to identify problems within the workforce. Employees were asked about the causes of errors that occurred, and solutions were put together to prevent these problems from occurring in the future in order to improve the quality of the work. In addition, they were able to measure and improve the work skills as well as the motivation of the employees, which leads to better work.⁶

In the 1980s, the first standards for quality within management systems were finally conceived. It took some time for the quality standards to be adopted, but it was mainly through total quality management that quality management became interesting and important for most companies. According to the DIN EN ISO 8402 standard, quality management is the manner of involving all employees, valuing quality, and satisfying customers as the basis for the long-term success of a company and its stakeholders.⁷ The TQM standard was followed by the EFQM standard, which was adapted by the European Foundation for Quality Management to European standards.⁸

3. History of the norms of quality management

In 1979, the foundation for quality assurance standards was laid in England. In that year, the quality management standard BS, abbreviation for British Standard 5750, was published. 8 years later, this British standard became the basis for the ISO 9000 series of standards, which is recognized worldwide. The standard series underwent several revisions in the following years. In the era of globalization, the

⁵ Bose, Tapan K. *Total Quality of Management*. Delhi, 2011

⁶ Schupp, Florian and Wöhner, Heiko *The Nature of Purchasing*. 2020 pp.92

⁷ Kern, Norbert. *Qualitätsmanagement In Altenpflegeeinrichtungen*. 2004 p.24

⁸ Baumgärtner, Armin, *Erstellung eines Konzeptes zur Einführung eines Qualitätsmanagements für eine Steuerberatungsgesellschaft nach dem EFQM - Modell für Excellence* 2012, p.11

standard series was quickly adopted in the industrialized countries and recognized and implemented worldwide.

The standards ISO 8402:1995 and ISO 9000:1994, which already existed at that time in the field of quality management, were combined to form ISO 9000:2000. The standards ISO 9001:1994, ISO 9002:1994, and ISO 9003:1994 were also included in the standard ISO 9001:2000. After years of using this standard, improvements were made to the standard and in 2000 the ISO 9001 series of standards were created, which set requirements for quality management. Over the years, the standard has been revised and adapted only slightly, as in 2008. In 2015, however, the current version of the quality management standard was created during a major revision of the previous standard 9001:2000.⁹ The new adapted standard required a context analysis and also included a standard structure created by the high-level structure that the 2008 standard did not include. The standard was now called ISO 9001:2000. The standard was now called ISO 9001:2015. Within this standard, topics such as planning, control, assurance, and improvement within the area of quality are of particular importance.¹⁰

The current certification standard for quality management is, therefore, ISO 9001:2015. The DIN EN ISO 9001:2015 standard is a quality management system that comprises more than 1.1 million issued certificates. The DIN EN ISO 9001:2015 standard is, therefore, one of the most widely used standards for ensuring product and service quality. In 2015, there was an addition, a so-called revision, to the already existing standard DIN EN ISO 9001. The name of the standard was composed of the abbreviation DIN, the German industrial standard, and EN, the European standard. The abbreviation ISO stands for the International Organization for Standardization.¹¹ This standard is a predefined catalog of standards for minimum requirements in the area of quality management within a company. Specifically, this standard combines quality management (QM) requirements that apply to each individual company. This universal standard gives companies a basis to become more appealing to customers since all standards are internationally standardized.

⁹ Zehnder, Dominik, "Historische Entwicklung des Qualitätsmanagements". . 2019. <https://www.nexgen.ch>

¹⁰ Paeger, Jürgen, *Eine kleine Geschichte des Qualitätsmanagements*, 2015 Available at: www.paeger-consulting.de [Accessed 27 Jan. 2021].

¹¹ Reimann, Grit, *Erfolgreiches Qualitätsmanagement nach DIN EN ISO 9001:2015*. Berlin, 2017, p.2

Despite the standardized procedures, quality management varies from company to company and can be implemented differently in each company.¹²

4. Best practices

The standard DIN EN ISO 9001: 2015 is accepted and implemented not only in Europe but worldwide as a generally accepted standard in quality management. In the field of quality management, the standard is the most current and best way to increase quality in the company, to focus on the customer, to promote teamwork and independent work of employees, as well as to optimize processes and bring about continuous improvements within the company. The standard is implemented in many areas but especially in the automotive industry it is often used to integrate the standard into the processes of the huge companies and to remain appealing to the market and the customer in the long term. An example of a company that has improved its quality management through the DIN EN ISO 9001: 2015 standard is the Asian automotive company Toyota. To illustrate the work within quality management, I have illustrated the two main areas of TQM within Toyota. Toyota's work philosophy is based primarily on customer satisfaction, but also on the appreciation of its employees, who are largely responsible for its success. They advertise that they design first-class products and services for their customers, which can only be put into practice through the work of their employees. Moreover, the company is constantly working to improve its work and tailor its products more and more to the needs of its customers.¹³ The first time Toyota operated deployment policy within TQM was in 1961. From that point on, things did not always go according to plan, but after a few years, Toyota found its way to implement TQM properly. The business planning department is responsible for the overall business plan of the company and therefore also for its goals and improvements. In order to create an annual report, 4 different steps are used year by year to locate errors,

¹² Brugger-Gebhardt, Simone. *Die DIN EN ISO 9001:2015 Verstehen: Die Norm sicher Interpretieren und sinnvoll Umsetzen*. 2nd ed. 2016, pp. 3

¹³ Iswary, NN. "Total Quality Management Von Toyota". *Qualität Ist Messbar*. 2021,. <https://www.qualitaet-ist-messbar.de/total-quality-management-tqm/total-quality-management-von-toyota/>. Accessed: January 28 2021

improve processes and solve problems. In the first step, the "function councils" identify cross-company issues for the plan, consider the company's values and how certain processes can be changed, and communicate the results to the respective departments. The general councils identify tasks that need to be addressed in order to achieve the overall objectives, and these actions are passed on to the relevant department. These departments, in turn, formulate tasks and objectives to be achieved and distribute them to team leaders and department heads. Finally, individual tasks assigned to individuals and departments are carried out. Goals are reviewed to ensure that the targeted tasks are being performed correctly. Semi-annual and quarterly reports are prepared for this purpose. Errors are detected and systematically eliminated through these records.¹⁴ With regard to the employees, the company Toyota carries out total quality management. Not only does the company place great value on its workers and their work, but they also strictly divide who is responsible for what tasks without creating or considering a negative hierarchy. It is simply determined that certain tasks will be handled by certain positions that know the material best. Toyota's policy deployment system specifies exactly that. Toyota's top management is responsible for the strategic direction within the company, middle management is familiar with the tactical plans and processes, and the suggestions for improvement are implemented within lower management. The lower management in this case are team leaders who are responsible for the workers as well as department heads. Toyota therefore specifically applies the principles of the ISO 9001 standard and is intensively engaged in process improvement within the workforce.¹⁵ On the other hand, Toyota attaches great importance to quality. Toyota is very interested in avoiding defects, satisfying customers and delivering good quality products. Toyota still uses TQM approaches in its production processes. Total quality management in this case refers to all processes inside as well as outside the company, from the production of individual parts to the delivery of the finished car to the customer. Within quality management, they refer to various processes and methods for ensuring quality in all areas. For example, they use quality function deployment to incorporate customer requirements into their product selection, and failure mode and effective analysis to identify and eliminate defects at an early stage.

¹⁴ Hino, Satoshi. *Inside the Mind of Toyota*. New York, NY, 2008, pp.112

¹⁵ Hino, Satoshi. *Inside the Mind of Toyota*. New York, NY, 2008 p.114

In addition, Toyota uses the phrase "Poka Yoke" during its production process, which means to avoid unintentional errors, so they use a zero error policy as it already appeared around 1960.¹⁶ Toyota continues to implement the principles of the DIN EN ISO 9001: 2015 standard to this day and is constantly working to improve its quality standards and to use the defects within the automotive industry to its advantage and eliminate them on behalf of its customers with the help of its employees.

¹⁶ Rockstedt, Marcel, *Die Erfolgsstrategie von Toyota. Toyota Produktionssystem und "Toyota Way"*, 2009 p.