Standardization and integration

Quality has far reaching digital impact

Industry 4.0 is on everyone's lips and has found its way into the production processes of many companies. Whether as a global player or an SME, they all agree on one thing: those who do not take the step into digitization will not be competitive in the long term. But what does Industry 4.0 mean for quality management? What opportunities are there? What potentials can be used? Can costs be reduced further and quality even increased?

Digital quality processes

Over the past few years, many companies have started to digitize individual quality processes in a first step, using special CAQ software. For example, if the initial sample report is created using a special tool, significantly fewer errors occur during creation, the data can be exchanged faster with the customer, and response times for assessing reports are shorter. These advantages are clear and indisputable. Similar potential savings can be achieved through the digitization of Failure Mode and Effects Analysis (FMEA) or Complaint Management. Software manufacturers specializing in CAQ systems also offer tools and modules for all relevant quality processes, such as inspection and production control plan, production accompanying inspection, incoming and outgoing goods inspection, supplier evaluation, audit management, action management, feasibility assessment, APQP or inspection equipment management.

Network quality processes

The digital networking of quality processes also opens up completely new possibilities. It makes the systems consistent and allows to establish a quality control loop to increase process efficiency and product quality. The aim of the quality control loop is to learn from mistakes and to avoid repetitive errors. In order to achieve this, all knowledge and experience generated in the product lifecycles (ultimately all complaints and the resulting actions) must be stored in a central database and stored in the CAQ system so that all quality processes can access them at all times.

FMEA as a central building block

The central CAQ component for such a quality control loop is the FMEA, as it combines planning and reality, forecasting and actual occurrence. If all events and insights from the entire manufacturing

process flow back into the FMEA, they can automatically be included in the development of the new parts in similar projects via the consistently enhanced new FMEA. Repeat errors can be avoided in a highly efficient way.

The FMEA can be closely integrated with complaint management, action management and the inspection and production control plan. This and the database-oriented structure of the software ensure that all data records are always consistent and that information in the drawing, inspection plan, measurement result and release always match - and thus withstand every audit.

Another advantage of networking quality processes: it is possible to compare the actual error frequency with the FMEA without much effort. Thus, the work plan, production control plan and inspection plan can always be adapted effectively to eliminate all unnecessary inspections. This saves time and money.

Advantages of the inheritance technology

Meanwhile, the creation of FMEA of similar components is done quickly, provided that the CAQ software works with the so-called inheritance technology. The software assists the user in using the similarity of the products or processes to be analyzed for the easy creation of additional FMEAs. A basic FMEA accounts for up to 90 percent of all parts in many companies, from which it is easy to derive the FMEAs and inspection plans of other components. FMEAs then no longer have to be maintained manually but are adjusted automatically using inheritance technology: if a process step or an action changes, these changes are automatically taken into account in all FMEAs that use this FMEA module.

Globally positioned: knowledge resource and knowledge transfer

Businesses are increasingly operating globally and often have multiple locations in different countries and continents. For these businesses, the development of a central knowledge resource and the interdepartmental or multi-site transfer of knowledge is particularly valuable. Knowledge resource and transfer are gaining in importance if the locations also have different competencies, for example, development is in Europe and manufacturing in Asia. In order to be able to incorporate the manufacturing know-how in the development of new products, a smooth transfer of knowledge is necessary - and this is only possible if all locations use a common database.

Integration through harmonization

In addition to the common database, a thorough integration of quality processes - even beyond national borders - requires optimum integration of the CAQ system into the existing infrastructure and server landscape. Suitable interfaces are imperative. It is also important to standardize import formats in CAD systems as well as in ERP systems and to integrate measuring systems via common hardware interfaces to facilitate the data transfer between the systems. The more data and information flows into the quality control loop, the more efficiently quality processes can be designed.

Relationship change: customer and supplier

The customer-supplier relationship also benefits from the digitization of quality processes, as it enables communication and data exchange clearly and simultaneously. The best example is the processing of the initial sample inspection report with the appropriate software and the exchange of inspection reports via a web portal: the data exchange is faster, the reaction time when assessing reports is shorter and re-sampling is less frequent. These are cruicial prerequisites for preventive quality assurance for purchased parts.

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