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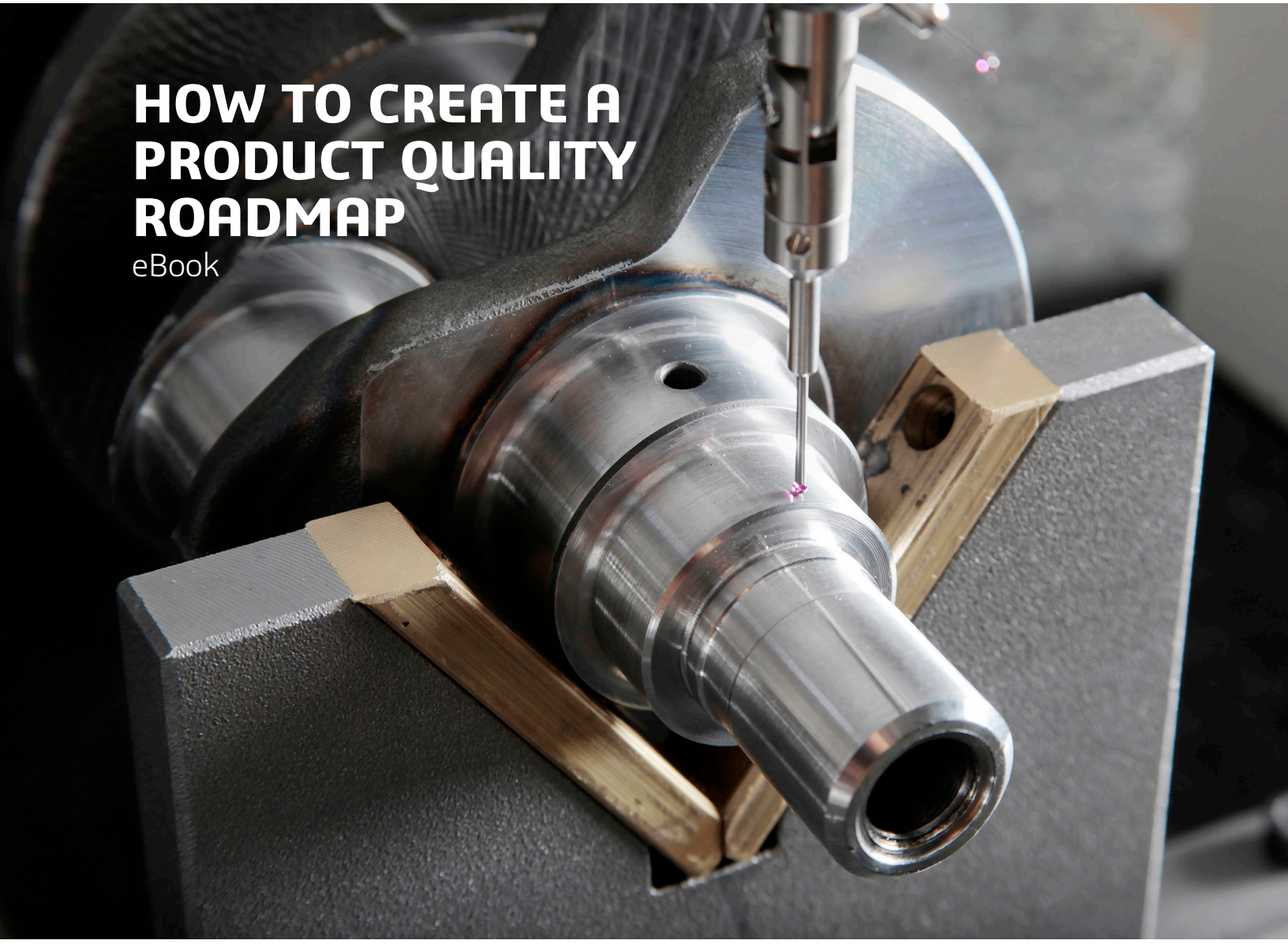

# HOW TO CREATE A PRODUCT QUALITY ROADMAP

eBook

DASSAULT SYSTEMES

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## EXCELLING AT PRODUCT QUALITY WINS MORE CUSTOMERS

Striking a balance between external, customer-driven quality metrics and internal, efficiency-oriented ones is a challenge every manufacturer confronts as they grow. Excelling on both is a challenge and creates a strong foundation for growing today's manufacturing business. Making manufacturing quality what you're most known for is also the quickest way to increase sales.

B2B buyers rely more on independent articles, industry analysts, and crowdsourced product reviews than ever before. According to Forrester, 74% of B2B buyers research half or more of their work purchases online before buying. The same Forrester study found that 30% make half or more of their work purchases online today, and 56% expect to make half or more of their work purchases online in 3 years. So the ultimate goal of having your organization appear on the first page of Google search results by analysts, industry press, and review sites - all because of your efforts in improving product quality – is achievable.

The following are the seven ways product quality is winning more customers today:

1. **Build a reputation for excelling at the most challenging, stringent quality standards in your industry, especially if you produce highly regulated devices.**
   Marketing, lead generation, and selling programs that show measurable results help prospects see themselves attaining their quality goals. The more regulated an industry, the greater the competitive strength of compliance expertise. For example, in medical device manufacturing, expertise in FDA, 21 CFR Part II, and ISO standards are invaluable in attracting new prospects willing to pay a premium for the highest quality products. Excelling at, meeting, and exceeding quality standards pays.

2. **Look to find ways for your customers to validate your product quality by arranging calls with industry analysts industry press and encouraging them to leave reviews online.**
   A strong reputation for quality validated by customers is what industry analysts, the press, and the blogging community need to keep producing content. All three of these influencers are looking for compelling stories of how B2B products and services are solving customer problems. Add to this the proliferation of review sites that bring Amazon and Yelp-like features to product reviews, and the implications are clear: excelling on this dimension of product quality generates new opportunities.

3. **Use the strong product quality foundation to create new products for new markets, attracting entirely new prospects and customers.**
   Every manufacturer knows about the areas of opportunity in their markets and industries no one has the production capacity to focus on. The more customer-driven quality is, the more opportunities there are to invest the time savings into new product development, spin-off product line extensions, and strive to create entirely new markets. Using product quality strengths as a foundation, manufacturers successfully open up new markets adjacent to those they are in today.

4. **When product quality becomes a core strength of any manufacturing business, faster response times, greater accuracy, and the potential to improve every customer interaction are possible.**
   Getting control of product quality and minimizing its potential to disrupt operations is the first step in accelerating any manufacturer's ability to compete. There are too many benefits to list how much product quality accelerates a production operation. The bottom line is that it leads to excelling on the dimensions that matter most, and those are the customer's expectations and needs for on-time delivery and perfect order performance.

5. **Trust is the most powerful sales accelerator there is, and it's earned every time a product or service delivers more than is expected, earning praise from customers and new prospects via word of mouth.**
   Making a greater level of trust happen starts by revolutionizing the quality and making it so strong that it redefines daily customer experiences. Manufacturers often use Net Promoter Scores (NPS) to measure the relative level of customer satisfaction in their customer bases. Knowing how customers perceive quality and which areas are the most in need of improvement is essential. NPS also has a word of mouth index, which is **a great way to track how quality impacts referrals and new prospects.**

6. **Improving product quality reduces Return Material Authorization (RMA), warranty costs, service recovery, and recall costs, leading to less customer churn.**
   Customers leave when product quality drops below their minimum expectations. They also leave when a manufacturer's services department becomes too difficult to deal with due to outdated, bureaucratic procedures and when product recalls making items worthless. Manufacturing Intelligence software can provide insights into which points of failure are driving the worst possible outcomes for customers.

7. **Launching Configure-Price-Quote (CPQ) as a growth strategy requires product quality to be the most scalable, high-speed process in manufacturing.**
   Pursuing a CPQ strategy that provides a range of products customizable by customers requires each phase of product quality management and compliance to be fine-tuned and efficient. It's possible to launch a CPQ strategy anytime.

   Quality processes and systems must be scalable, quick, integrated, and reliable to excel and realize this product and selling strategy's potential.

## HOW EXCELLING AT COST OF QUALITY ACCELERATES COMPANY GROWTH

McKinsey found that the faster manufacturers' real-time production and process monitoring data is interpreted and acted on, the greater the multiplicative effects of smarter quality company-wide. Smart quality controls, including Programmable Logic Controllers (PLCs) capturing real-time process data, are providing a 50 – 100% increase in productivity and processing speed compared to manual methods, according to McKinsey. In addition, smart quality assurance also provides a 25 – 40% increase in product quality and a reduction in the total cost of quality.

McKinsey also found a 25% to 45% decrease in the time needed to identify quality issues when real-time data is available. In addition, real-time production and process monitoring create a smarter compliance foundation that scales to support new products and change approvals more quickly than manual approaches. In conclusion, McKinsey found that having a real-time production and process monitoring system providing data manufacturing operations could reduce the total cost of quality while identifying the process areas where quality can most be improved. See McKinsey's survey analysis in their article, Smart quality in advanced industries, for additional details.

Extending product quality far beyond the boundaries of compliance is the catalyst that drives increased sales and satisfied customers. As a result, innovations proliferate across all manufacturing sectors, from 3D printing to WiFi-enabled products capable of real-time data integration.

### Accepting The Challenge Of Innovating Quality As Fast As New Products

The intensity going into innovating new products needs to go into quality too. According to Gartner, A successful new product can deliver 70% or more of a given manufacturer's new revenue growth every year. It has been proven many times over that doubling down on R&D to out-innovate competitors, and the market pays off.

How can a manufacturer innovate quality management just as fast as new products? By concentrating on several core areas explained below:

- **Improve Document Control and Management first.** Having an automated, secure document control and management system is a must-have for Quality Management today. Improving the effectiveness of how electronic storage, version control, and retrieval of quality documents directly impacts product quality. The goal is to make work instructions and Engineering Change Notices (ECNs) organizations accessible in real-time across the shop floor.

- **Make Continual Complaint Management Improvements.** Tracking customer complaints and tying them back to Return Material Authorizations (RMAs) is one of the most common ways manufacturers improve product quality. In addition, complaints provide new ideas of how to innovate faster. Advanced analytics can quickly identify complaints RMAs and isolate product failure trends in the field. The most effective complaint management systems can also provide product management and development with new product ideas using predictive analytics.

- **Improve Corrective & Preventive Action (CAPA) and incident management** – CAPA can't be an island anymore. The data it provides is essential for everyone to own product quality in an organization. Manufacturers want to get CAPA data better distributed through their operations so all departments can see what's causing nonconforming or unplanned events. The goal is to improve how fast investigations, action plan development, and implementation of preventive actions while reducing the risk of recurrence.

- **Consider piloting internal control systems analytics.** Providing in-compliance manufacturing operations with applicable laws and regulations is area manufacturers want to see improvements. Knowing that policies and procedures implemented effectively ensure compliance, improve operational efficiency, and improve visibility and control is needed.

- **Real-Time Change Control is core to Quality today.** Manufacturers need real-time data supporting their workflows and processes to achieve real-time change control. Identifying how changes in quality processes, procedures, and corrective actions contribute to higher product quality is a must-have to innovate faster than competitors and stay ahead of the market.

- **Improve Real-Time Data Submission and Reporting.** Table stakes for any manufacturer are the need to capture product quality data from legacy and 3rd party systems into a single, unified view of quality company-wide. While today, many quality systems can provide a raw data dump, what's needed is more intuitive, graphical dashboards for reporting this data in context so action can be taken.

- **Invest in Real-time production and process monitoring.** Manufacturers need real-time visibility into the machine and process management to keep production schedules updated, orders on track, and identify potential roadblocks. What's needed is a system that can track all aspects of production to see where they can improve shop floor and machine efficiency, visibility, and productivity.

- **Improve In-Line Product Quality And Consistency Tools.** The goal of these tools is to reduce the variation in finished products by identifying problem areas in production early. In addition, to out-innovate competitors and the market, manufacturers need the latest tools to achieve in-line product quality and ensure good product consistency.

- **Invest more in virtual support for training and qualification needs.** Legacy manual systems or time-intensive portals will not get enough employees certified fast enough to keep quality getting stronger. Expanding virtual support and training systems need to integrate training and certification requirements for employees. Making training and certification available to suppliers, partners, and service providers also needs to happen. All these steps improve product quality and make it a competitive strength.

## HOW TO DEVELOP A QUALITY AUDIT PLAN THAT TRACKS IMPROVEMENTS

Your prospects, customers, channel, and service partners evaluate you more on product quality than anything else. Making that reputation a solid one, your company can grow for years by focusing on quality metrics and key customer-driven performance indicators (KPIs).

- Most manufacturers have Statistical Process Control (SPC) processes to measure, monitor, and improve manufacturing quality, yet could be achieving more by taking a systematic approach to internal quality audits.
- Manufacturing audits most often find Non-Compliance and Corrective Action Preventative Action (CAPA) areas for improvement that, once addressed, lead to higher production yields and faster time-to-market
- Bringing an energized intensity to each phase of the Deming Cycle is essential if any audit will deliver lasting change in product quality.
- Getting on a regular cadence of internal quality audits often uncovers areas for improvement across a diverse series of process and product-related areas, including Supplier Quality Management (SQM), Document Control, Training, Production Scheduling, regulatory compliance, and product returns.

### The Best Internal Audits Always Keep Customers First

Nonconformance, Corrective Action/Preventative Action (CAPA), returns, reworked sales orders, and rejected orders are early warning signs that customer relationships are at risk. When designing an audit, it's important to take the quality metric or key performance indicator (KPI) that directly impacts customers. The following are the key factors why the best internal audits always keep customers first:

- **The greatest strength of Six Sigma is improving business processes, so they exceed customer expectations.** A quantified definition of customers ' expectations and requirements is at the center of any excellent Six Sigma-based quality audit. Integral to Six Sigma is the DMAIC (Define, Measure, Analyze, Improve, and Control) methodology that provides a flexible framework for troubleshooting where processes fall below customers' expectations and which process improvements will make the greatest positive impact.

- **Committing to a strong and quickly deployed service recovery strategy based on internal audits creates credibility and customer goodwill.**
  Immediately after an internal audit is complete, it's time to launch a service recovery strategy to resolve the problems that initially led to the audit. An example of a service recovery strategy is providing a free year of maintenance on a product that may have quit working. Service recovery strategy aims to compensate customers for the time they lost due to poor product quality.

- **The urgency to excel for customers' needs means to drive the Deming Cycle in each audit until it becomes a core part of the quality DNA of any manufacturing operation.**
  Bringing an energized intensity to each phase of the Deming Cycle is essential if any audit will be a lasting change in product quality. Defining and executing the PDCA (Plan, Do Check Act) approach to audits and improvements increases their chances of success. Over time this approach ingrains quality into the DNA of any manufacturer.

**How To Do A Quality Audit That Tracks Improvements**

The scope and scale of quality audits vary by type of manufacturer, yet all share a common set of characteristics. The following are the lessons learned on how to do a successful quality audit:

1. **Capture data on process and product areas that will be the audit's focus.**
   The best data is from customers and the failures they are experiencing, coupled with internal data on specific products and workflows. Getting this data will help define the scope and scale of the audit company-wide.

2. **Define the audit goals, timing, and type based on the data obtained from customers and company-wide.**
   Full-scale audits include interviews with manufacturing, operations, supplier quality, and product quality assurance members. Define customer-centric audit goals considering the PDCA approach to solving product and process quality problems. A critical success factor to any audit is setting accurate timeframes and schedules. Defining the best possible audit timeframes (matching the audit type) to get the most valuable data possible is key to troubleshooting problems quickly.

3. **Select a cross-functionally-based trained audit team and appoint a senior executive as champion.**
   A senior management team member can quickly remove roadblocks to getting audits done on time and delivering customer-driven results. Having a cross-functional team brings the needed insights to quickly complete the audit and take action to alleviate the systematic and product-based challenges. If trained auditors are not available, create an Auditor Certification Program. This program needs to include courses on the essentials of Quality Management Systems as defined by ISO 9000, audit execution, the role of an ISO Lead accessor, training in TQM, Business Process Mapping, and other techniques to analyze and take action on quality data. Auditor training also needs to cover embedded workflow functionality, workflow Gantt charts, and document control.

4. **Define audit modules and assign auditors to complete each according to the overall audit project plan.**
   Each audit module focuses on specific product quality, workflow, or business process areas contributing to the overall audit plan. Therefore, it's important to define a standardized approach or protocol to complete each audit module, so the data and insights captured are scalable and useable across all manufacturing operations.

5. **Perform the plant audit on a module-by-module basis, designing the cadence and timeframes to meet ISO requirements.**
   The best internal audits are designed to capture manufacturing systems and processes interactions. As a result, they are scheduled for a specific time frame or duration. Therefore, it's important to have a schedule of module completion that guides internal audits to capture all available troubleshooting data.

6. **Summarize the findings and propose a plan of action for solving the quality problems immediately.**
   The audit team's senior executive works with each author to summarize and provide a clear roadmap for improving product and process quality. The audit champion also needs to define and take action on strategies to turn the supplier quality, sourcing, and work floor quality levels to the work instruction level to solve the quality problems.

7. **Audits often surface new metrics and key performance indicators (KPIs) that provide insights into a new area of process improvement and manufacturing quality.**
   Having auditors provide the most useful metrics, and KPIs they found during their individualized audits and adding them to the manufacturing quality dashboard helps drive improvement. In addition, using existing data to gain new insights is how manufacturers begin the journey of continually improving quality.

8. **Using Six Sigma and DMAIC-based data to drive Manufacturing Intelligence and predictive analytics of where and how quality can be improved is today's evolving best practice.**
   The ability to quickly interpret and act on Manufacturing Intelligence will be the strongest competitive differentiator many companies will have in the coming decade. Manufacturers have the opportunity to take quality management to a predictive level of performance by using Manufacturing Intelligence-based solutions to gain insights into Six Sigma-based data.

## CONCLUSION

Creating a product quality roadmap is table stakes for staying competitive in manufacturing today. Instead of reacting to product and process quality problems as they come up, the better approach is to identify potential quality problems before they grow and stop production. The goal needs to be having a real-time view of each machine, process and raw material and see how they can be combined together to deliver excellent product quality all the time. Adding in audits and continual production and process monitoring to strengthen a closed loop system is the secret to having a strong product quality roadmap. The data coming from the shop floor helps guide product quality efforts and keeps them on track.



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