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Whitepaper

6 Best Practices on How to Manage Quality

Learn How Fostering a Culture of Continuous Improvement Advances Design and Business Results

Integrating Quality with Development Can Open the Door to Innovation

Quality Management Systems (QMSs) are aimed at reducing risk of company oversights, employee missteps or product design errors. When integrated with design and development, quality management systems are also an engine for collaboration and innovation. A well-run QMS brings the entire company together to solve problems, standardize processes and meet the demands of customers and regulatory agencies. Moreover, the quality process can become the cornerstone of your company, making you a creative design leader.

QMS systems may span everything from company policies to document management. They can also include standard operation procedures to remediate nonconformances. And perhaps most powerful of all, they can act as a repository of planned improvements, driven by user feedback. At the core of QMS, we find solid product quality processes that build a culture of learning from both success and failure. Failure is part of the iterative process of design and an opportunity for innovation. Making quality a core input into the design process puts continuous improvement at the center of your product development process.

In this whitepaper, Arena highlights best practices for and benefits of managing quality as an integrated part of your manufacturing business. We'll uncover the importance of using quality processes to build a culture of collaboration and innovation by considering the following:

- Internal Continuous Improvement Driving Innovation and Results
- Public User Feedback and the Quality Process
- Quality and Innovation Processes as Company Differentiators
- Product Quality Tools Supporting Collaboration and Innovation

Internal Continuous Improvement Drives Innovation and Results

Companies today realize an investment in quality can drive product innovation and company success. It all begins with adoption of a collaborative quality mindset throughout the entire organization. Getting all stakeholders involved in targeting high value quality initiatives results in a broader arena for problem solving. More creative solutions lead to faster product improvement and, consequently, increased company success.

Breaking it down further, there are two critical pieces to making quality an innovation driver – creation of a collaborative and creative environment and focusing that collaboration on quality problems that matter to business success. Collaboration is significant because it allows cross pollination between groups, encourages sharing of ideas and promotes learning from coworkers. It also generates broader trust between departments. That trust makes it easier and easier to spot opportunities and connections that span disciplines. It enables coworkers to troubleshoot complex problems as a team, rather than as adversaries.

Consider a famous story about Steve Jobs and his organization of the Pixar office. Steve deliberately set up the office with one central bathroom, to encourage company-wide interactions. Employees had to see one another in transit, (and while using the facilities) and so were briefly forced out of their silos.

> "We wanted to find a way to force people to come together," Jobs said in 2001, "to create a lot of arbitrary collisions of people." It worked. "The bathrooms in the centre initially drove us crazy," Brad Bird, the director of Ratatouille and others, told McKinsey Quarterly later. "But [Steve] realized that when people run into each other, when they make eye contact, things happen." In 2006, Jobs sold the company he had bought for $10m to Disney for $7.4bn. Over the course of the studio's history, Pixar films have won 27 Oscars. (1)

Kaiser Permanente is a company invested in continuous improvement and now seen as an innovative leader in the medical industry. A Harvard Review article about Kaiser Permanente's quality culture had this to say:

> "What does it take to cultivate a culture of continuous improvement? Three conditions must exist: People must have a rational understanding of how small improvements compound to make big differences. They must love improving—both because they are passionate about the importance of their work and because it feels so good to move to a new level of performance. And they must have enough confidence in their colleagues to believe that the organization is capable of making progress." (2)

Kaiser is a market leader in delivering innovative healthcare solutions, online services and fully digital medical record management. And Kaiser uses data to inform everyone in the company where opportunities lie for improvement:

> "In the last five or so years, Kaiser has also been using the information to identify those doctors or clinics that excel in certain areas, as well as those in need of improvement. The organization has also used the records to change how it delivers care, identifying patients at risk for developing bed sores in the hospital and then sending electronic alerts every two hours to remind the nurses to turn the patients. The percentage of patients with serious pressure ulcers, or bed sores, dropped to well under 1 percent from 3.5 percent." (3) (New York Times Article, "The Face of Future Health Care", March 20,2013, by Reed Abelson)

All employees in the Kaiser ecosystem understand what they are doing well and where they can contribute to better patient care. With this information, Kaiser then empowers employees at all levels to suggest innovative changes:

> "When a nurse in our northwest region got the idea for an automated insulin drip calculator, she spoke up—and managed to render the old method, with its error-prone manual entries into Excel spreadsheets, obsolete. We pilot-test the most ambitious ideas at our Garfield Health Care Innovation Center, which features a simulated hospital setting as persuasive as any Hollywood set." (4)

Kaiser has created a collaborative environment with clear quality goals, empowering all members of their company to participate in the process of improving their delivery of health care services. As a result, Kaiser is an innovation leader in the field and one of the largest health care providers in the country with over 9 million members. (http://www.kp.org)

This philosophy of continuous improvement applied to business processes is most often known as the Kaizen model, after the Japanese word for 'good change.' After WWII, an American-led occupation force assisted in re-building Japanese capacity. Part of this cross-cultural exchange included quality and management training. With that training, several Japanese companies implemented this Kaizen approach to daily operations for continuous improvement. Since that time, this culture has spread throughout the world and proven to result in higher quality products and, as a result, greater financial success.

Public User Feedback Calls For Innovative Quality Responses

However, this internal collection of quality issues from employees is not enough in today's wired world. Consumer electronics, high tech and medical device companies are realizing they must include management of consumer opinion in the approach to product development. With product reviews trumpeted by customers to the twitterverse and blogosphere, even small quality issues can result in large financial impacts to the business. This era of increasingly public user input calls for an effective and innovative quality response.

Amazon product ratings and Yelp reviews give users a large platform to communicate dissatisfaction and a single negative comment can cause a snowball effect. People pile-on when they see others with the same problem, demanding a customer response while simultaneously warding off new buyers. Whole industries have risen up around search engine optimization (SEO) and online reputation management as a result. The cost of a quality problem to customer perception can be devastating.

In a world of instant viral negative publicity, the argument for taking quality seriously has never been stronger. Consider the 2014 GM ignition–switch crisis to see how mishandling of a quality problem can quickly become national news. The awareness of down-stream quality costs has raised demand for quality processes that will catch these problems and address them BEFORE the whole world sees them.

Companies are now investing in tools and analytics to immediately see and quantify the effects of these product quality misses and product successes on consumer impressions of the brand. Point of sale data, returns, reviews and social media monitoring with big data tools are all now being employed to control and provide fast feedback to the product team with up to the minute product feedback. This real time information presents an excellent opportunity for continuous improvement. Successes can be amplified and failures often point out user needs that were not fully understood. Inclusion of multiple points of view allows broad ideation when reacting to problems. Since social media gives wide constituencies an instant voice, having these constituencies represented in the problem solving process increases chances that solutions will be well received. Reacting to customer complaints in a swift and appropriate way can actually increase brand loyalty.

Furthermore, by driving well-understood consumer needs back into the product development process, companies can morph product mistakes into new product successes. The key is quality processes geared to reacting quickly in addressing current problems while proactively channeling user needs into future product improvements.

Quality and Innovation as Company Differentiators

Publicizing the inclusion of user feedback as part of the development process gives innovative companies a way to differentiate themselves from competitors. Social media trends provide a perfect opportunity to get the most out of a fast acting quality system. By advertising the successful results of a collaborative and innovative quality process, companies on the cutting edge of design can make a positive name for themselves.

Silicon Valley companies like Apple, Tesla and Nest are well known product innovators and their cultures are built on understanding and meeting user needs in new and novel ways. In Apple's case, their reputation for products that yield a great customer experience is so powerful that they are players in markets even before they have product to sell. These companies' iterative design processes and relentless focus on the user experience stem from a design methodology called "Design Thinking." This methodology highlights the response to quality issues and user feedback as a cornerstone to innovation. These companies publicize the Design Thinking tenets of user research and iteration as key elements in their product successes.

Design Thinking is a user-centric approach to design problem solving, popularized by the Stanford Design School. But whether you call it "Design Thinking" or something else, using user feedback early in the design cycle enables companies to build the best possible prototypes, learning and iterating through a testing process. This is the quality process applied proactively, in a controlled way. It focuses on learning from both success and failure and takes all feedback as a driver for future success.

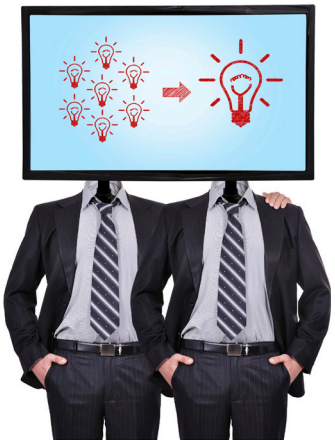
Take North Carolina apparel manufacturer Lolly Wolly Doodle. In a recent Inc. Magazine article, Lolly Wolly Doodle detailed its preview sale strategy, using Facebook to gather early consumer response to designs. After making a single sample, Lolly Wolly Doodle collects feedback and preorders. Successful designs are then produced in greater volume and used to inform future product directions. This company, while small, has gained national publicity by using innovative user centered data to drive production. They have no excess inventory and don't invest in designs that don't sell – all because they have baked user feedback into their early development process. (5)

Connecting to this trending design philosophy publicly allows companies to both increase their public hipness coefficient and emphasize the importance of design thinking internally. Just as companies brag of six sigma and lean manufacturing processes to gain competitive advantage, public use of product quality and design thinking to augment development can provide the same opportunity. Connection of QMS processes to the latest innovation methods helps both internal and external audiences appreciate the value of quality processes. Employee participation as creative thinkers and problem solvers is elevated to innovative development contribution rather than reactive shameful firefighting. And the company reputation is now one of cutting edge design thinkers, not reactive dinosaurs.

Product Quality Tools that Support Collaboration and Innovation

A new holistic approach offers companies an opportunity to improve product quality, manage customer expectations and change the company's fundamental culture. For some, quality culture improvements may even

be a critical component to company survival in today's hyper-connected consumer market.
For all companies, improved quality addresses larger business goals, including time to market, greater innovation, reduced cost of goods and increased profit.



To build a culture of innovation and collaboration around product improvement, companies need tools that encourage interaction between customers and teams and support visibility to quality processes past and present. In product development work here at Arena, we talk with many companies trying to build successful quality cultures. Companies tackling CAPA (corrective and preventive actions), CAR (corrective action request) and SCAR (supplier corrective action request) processes or other remediation requirements need a collaborative platform to help gather feedback, creatively formulate solutions and drive these solutions into early design processes for optimal product progress. Common aspects of quality tools that help drive collaboration and innovation include:

- **A system that contains many perspectives.** A system which allows employees from all departments, partners and suppliers to participate in the process of identifying and solving problems will yield the greatest creativity in results.
- **Connection between the product record and the system used to track and address quality processes.** Visibility from part and assembly levels prompts cross-team collaboration and keeps quality at the top of everyone's mind. Furthermore, engineers and developers include quality inputs seamlessly in their daily work, without needing to search for feedback outside their comfort zone.
- **Inclusion of customer feedback.** A connection to a CRM customer relationship management system or a method of capturing user feedback within the Quality tool provides important visibility. Frequent validation of product value with customers and opportunities for improvement and innovation should be easily surfaced to drive company-wide understanding of product goals.
- **A searchable repository of quality processes past and present.** To innovate effectively and learn from mistakes, all users must be able to find historical issues, look at what has been tried, and build on past experiences.
- **Transparent assignment of responsibility.** To keep everyone focused on building better product and handling issues in a timely manner, clear process owners should be defined and assignments and deadlines made public. Open collaboration toward resolution is easiest when everyone understands how they can help.
- **A system of standardized templates and processes that supports Quality as a positive iterative process.** By building templates for quality work that are easily understood and followed, and make inclusion of Quality findings a regular part of business, everyone is encouraged to participate. Quality inputs must be assumed as part of the development cycle rather than feared as uncontrolled and unexpected hurdles.

Innovation is the holy grail of many product companies as they seek to differentiate their products from those of competitors. Integration of quality processes into the design cycle through collaborative quality tools can give companies the competitive edge they seek. All it takes is a shift in thinking, a willingness to embrace user feedback, and a methodology to drive quality into the product development process.

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About Arena

Arena pioneered cloud PLM applications. The company's products, including BOMControl, Exchange, and PartsList, enable engineering and manufacturing teams and their extended supply chains to speed prototyping, reduce scrap, and streamline supply chain management. Arena cloud PLM applications simplify bill of materials and change management for companies of all sizes, and offer the right balance of flexibility and control at every point in the product lifecycle—from prototype to full-scale production. Based in Foster City, Calif., Arena has been ranked as a Top 10 PLM solution and also holds a spot on the *San Francisco Business Times'* Best Places to Work List for 2013.

Author

Kathy has over 15 years of experience in product development, building products that range from software to medical devices, consumer electronics and power tools. Prior to product managing at Arena, Kathy worked at leading companies like D2M Inc & nLighten Technologies. Kathy graduated with BS in Biomedical Engineering from Brown University, with an emphasis in Biomechanics and holds a Masters Degree in Engineering (Product Design) from Stanford University. Kathy also lectures at Stanford University, teaching the senior capstone product design course, where students use the design thinking process to bring a product of their own design from concept to production.

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