

Quality Planning

Understanding best practices to establish and meet quality standards and drive your product to the next level.



ASI DATAMYTE

WHITE PAPER

What Is Quality Planning?

The traditional APQP (Advanced Product Quality Planning) standard defines product quality planning as:

“a structured method of establishing the steps necessary for creating a product that satisfies the customer.”

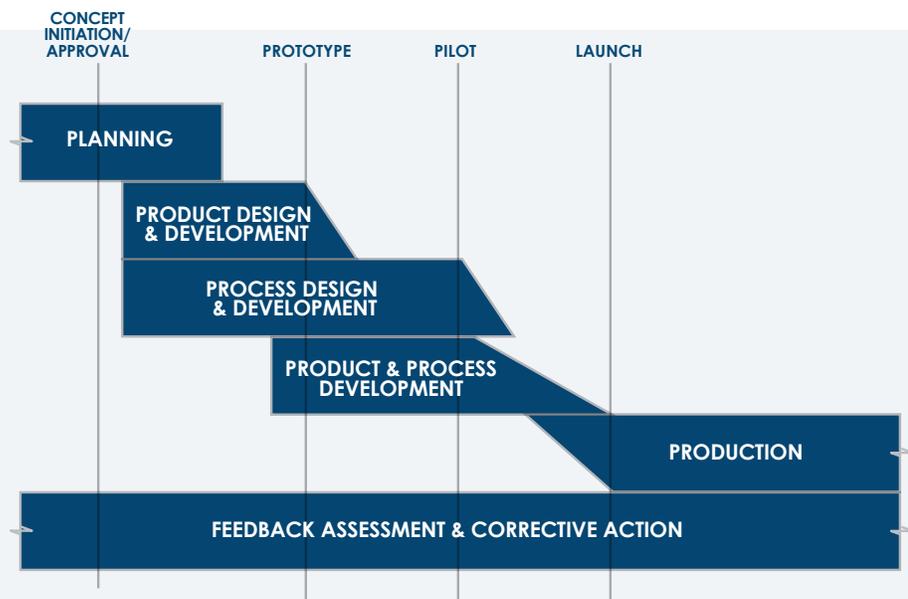
Sounds great, but what does it mean in the real world? For instance, what is a structured method? Could any “necessary” steps actually be optional? Most important, how can a manufacturer know in advance if the product will satisfy the customer?

Today’s top manufacturers’ viewpoint:

Quality planning enables a manufacturer to efficiently manage literally hundreds or thousands of fluid details driving design-to-production efforts, whether for one highly complex product (a vehicle, for example), or for many customized products—or perhaps for both. Good quality planning encourages cross-discipline communication and collaboration during the entire product development lifecycle, as teams keep up with inevitable changes while focusing on shared quality goals. The right techniques and tools—for example, an automated quality planning system to streamline the workload—help prevent costly errors and wasted efforts up front, thus assuring both quality and increased productivity throughout the product development process.



For example, some manufacturers utilize five formal phases of quality planning, with the output from each phase generating the next phase:



FIVE PHASES OF QUALITY PLANNING

1 Program Planning and Definition

Customer requirements, suggestions, and historical information about similar products are scoped and assimilated into product features, design parameters, quality/reliability goals, preliminary process information and product specifications.

2 Product Design and Development

The output of #1 above drives design tasks such as Design FMEA, DFM analysis, drawings, prototypes, material specifications, reviews, and test requirements.

3 Process Design and Development

The output of #2 above steers development of process tasks such as flow charts, process FMEA, process instructions, quality system reviews, and preliminary control plans.

4 Validation of Product and Process

The output of #3 above drives validation tasks such as pilot runs, verification of process instructions, product testing, inspection, and detailed evaluations of test results.

5 Feedback, Assessment, and Corrective Action

The output of #4 above drives final product launch tasks such as the application of lessons learned thus far, correcting as necessary before ramping up production.

Understandably, each phase of quality planning demands significant research, discussion, collaboration, data collection, data entry and management. In the end, comprehensive documentation or “paperwork” recording design or production details—including changes—is needed to facilitate a smooth transition to the next phase. Along the way, anything that can simplify these tasks or help reduce errors or costs enables that crucial competitive advantage in overall product success.

Why Is Quality Planning Important?

It is commonly agreed that maintaining quality is one of THE hallmarks of successful manufacture. Customers enjoy quality products at a fair price, generating more demand and market share. But quality is rarely an accident. Only manufacturers with comprehensive plans to ensure quality upfront are favored to survive, thrive and profit over time. Such foresight is especially relevant in today's global economy, where both manufacturing capacity and minimizing costs are top priorities no matter what. In broad terms, good quality planning is not characterized simply by an elaborate system of controls, data, and records, but rather by evidence of sustained improvement in quality, productivity and profit.

So precisely how does quality planning improve the bottom line? Isn't it costly? Can't worrying about quality all the time hamper productivity and further complicate the monumental logistical challenge of getting new product successfully out the door? Why not just step up final inspections? What if a quality planning system is cumbersome to use?

Let's examine specific examples of how—and why—a good quality planning system contributes to overall manufacturing goals.

• Prevention of errors

Not surprisingly, defining and monitoring distinct quality milestones for each planning phase reduces the likelihood of errors further down the line (such as in production). This “preventative” approach reduces the late-breaking showstoppers that create costly recalls, reworks, scrap, and more.

• Prevention of crises

With quality monitoring throughout product development comes better quality control. This stability means fewer “fire-fighting” emergencies to resolve, which optimizes labor talent and expertise.

• Faster product development

Sharing good quality planning initiatives and lessons from one project to another trims time and effort. These efficiencies speed up the project lifecycle, so new products or variations emerge sooner.

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- **Prevention of downtime**

Ensuring quality up front, i.e., as part of product development, means a smoother and more stable product introduction into production, helping to eliminate unexpected and wasteful downtime.

- **Maximized use of equipment**

Minimal downtime means expensive production equipment is operating to capacity, keeping productivity up.

- **Better employee morale**

As quality stabilizes and new products succeed, the day-to-day stresses from resolving emergencies fall away. Employees can focus more fully—and more efficiently—on their own innovations and tasks.

- **Timely delivery**

A compressed development cycle with reliable production output helps ensure that quality products reach customers sooner, with less chronic delay caused by newly discovered changes or errors.

- **Customer satisfaction**

Building quality into the design/production process greatly reduces the risk of a failed product getting out the door (or even getting into production). This in turn helps ensure that customer requirements are met error-free at the lower possible cost; a standard hallmark of customer satisfaction.

- **Increased profit**

The many benefits of quality planning contribute to a new bottom line, one of higher profit.

Implementing Quality Planning

Just a few basic parameters to consider when setting up a quality planning initiative:

1. Costs

The efficiencies gained through quality planning can be difficult to quantify at first glance. A good starting point is to analyze previous projects, looking objectively at statistics for downtime, recalls, rework, waste/scrap, poor use of personnel, extra activities to trace and resolve production/quality issues, idle production equipment, lost sales, late shipments, extra demands on technical support due to faulty product, and the list goes on. Put simply, the extra costs incurred from all this waste reduces productivity throughout the manufacturing environment.

Consider a past example where personnel were poorly utilized. Perhaps engineers were forced to drop their usual design tasks to chase down sudden instances of confusion over current product specs, work instructions, test results, or myriad other fundamentals driving product development. Obviously, the loss in handling traceability efforts like these is two-fold, in that 1) extra labor is expended on managing

emergencies that could have been prevented, while 2) less labor focuses on product design.

Better to have a reliable management tool that helps provide quick reference and traceability.

Watch out for redundant tasks too, such as creating from scratch “new” project documentation that simply duplicates that of a previous project, or manually recording the same data in multiple locations. Both examples of wasted effort burn through time/labor needlessly while also facilitating errors. Instead, with the right quality planning

software/hardware, data can be effortlessly shared and managed across many planes. This creates a synergy of fewer errors and simpler logistics.

2. Training

Not surprisingly, the right team members with the right expertise can make the difference

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“Quality is never an accident; it is always the result of high intention, sincere effort, intelligent direction, and skillful execution”

—William A. Foster

between the success and failure of quality planning initiatives. Team members need to gain full awareness of the features and capabilities of quality planning management tools, for example. Will the quality planning software and hardware package be easy to use, will it reduce errors, will it ensure a better product development process overall, and—perhaps most crucial of all—will it achieve these results without demanding even more time/effort? A good understanding of quality planning goals and how they can be achieved helps ensure genuine “buy in” throughout the team.

3. Flexibility

Manufacturing IS change. Producing one great product is an achievement, but can the product design be modified with ease—and implemented in production—for a new project starting tomorrow? Can new features be added, removed or changed on-the-fly without generating costly chaos? What if specifications evolve over the course of product development—can they be kept current so that the right product ends up in production? Only the best quality planning tool can help facilitate successful management of all this head-spinning change.

Hazards Of Traditional Quality Planning Methods

There are a few common pitfalls to watch out for in traditional quality planning, particularly if a global manufacturer’s projects are large, complex, and involve multiple teams and/or geographic locations. Without the right tools, managing vast amounts of ever-changing data throughout a project can be an overwhelming if not impossible task, regardless of expertise. Once data is mismanaged and/or falls through the cracks, the door opens wide for project-killing fallout such as potential production errors, rampant inefficiencies, insufficient quality, and all around waste and confusion.

Consider some of the documentation examples below, where quality planning is at risk for one reason or another.

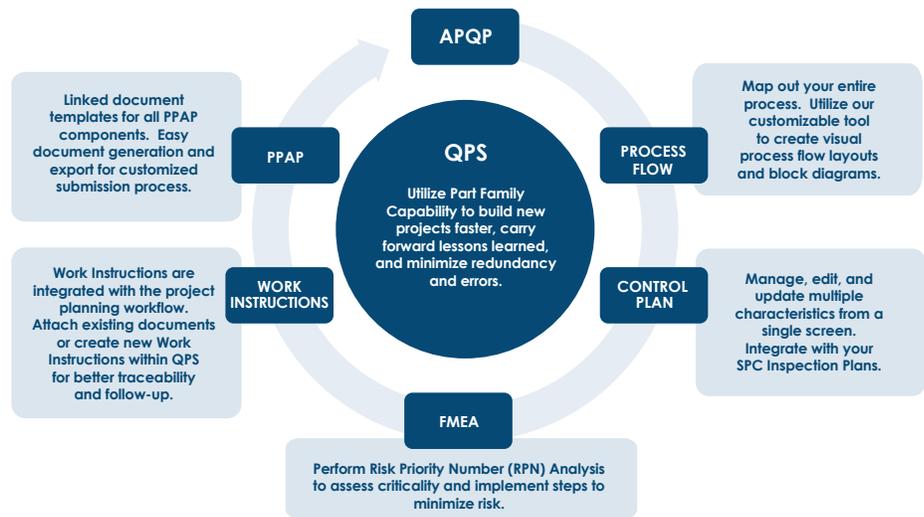
- **Redundant data entry:** Accurate, current, and accessible data drives project success. However, if for whatever reason the same data must be re-entered later in the project—or in a related project—that redundant task is obviously wasted effort that should be appropriately automated.
- **Discrepancies in documentation:** Duplicating project data manually in multiple locations, such as once in a document and once in a spreadsheet, is deadly for any quality initiative. This practice can lead to confusion when discrepancies inevitably arise; i.e., if the data changes in the future, there may be no guarantee that the unrelated locations are both reliably maintained and updated (which would be, again, a redundant task).
- **Project “A” may be isolated from Project “B”:** The ability to easily share commonalities from one project to another saves time and reduces errors. For example, passing along lessons learned on one project (a corrected family of certain parts, say) can prevent the same issue from arising on another. If such collaboration is difficult due to inaccessible project data or reliance on disjunct sets of documentation pieces, projects waste start-up time re-doing tasks.
- **Department “A” may be isolated from Department “B”:** Collaboration needs to be integral to the quality planning system. If, for example, design engineering records and maintains certain project-related data, but process engineering cannot easily “harvest” or find this data—or if they find only obsolete data—the project will run into difficulties.

The ASI Datamyte Software Solution

For today's data-driven manufacturing projects, it's no surprise that implementing a foolproof "hub" of reliable and accessible information—data for product design parameters, procedures, work instructions and more—is one of the cornerstones of comprehensive quality planning. Intelligently integrating this crucial building block into a quality planning system optimizes accuracy and efficiencies, saves time, and ensures that the many-faceted goals of quality initiatives are under control, fully documented and easy to access. Moreover, when quality efforts—and gains—permeate the entire planning process, this can help ensure full manufacturing capacity throughout the life of the product. ASI's Quality Planning Studio software solution, tried and true with quality managers for over a decade, is a great example, as it integrates so many quality planning concerns.

Take Action to Prevent Crises

A quick look at this logical and consistent software studio for APQP reveals several key features of obvious benefit in frantic "fire-fighting" manufacturing environments. The common database provides an interface for immediate cross-discipline collaboration around reliable facts rather than static and obsolete forms that can be hidden or lost. The ease of harvesting up-to-date information (such as for re-use in a related project) can eliminate redundant tasks, help reduce workloads, enable changes virtually in real-time, prevent errors or discrepancies, and encourage overall participation. As a result, quality is smoothly "built-in" proactively, with enthusiasm and at a faster pace. Time-consuming and distracting emergencies wane, productivity rises.



Consider just a few highlights of Quality Planning Studio listed below:

- **Automated data updates en masse through dynamic links**
Save time and reduce errors with changes (such as new product requirements) affecting multiple locations in the database. Change the data once, and desired linked documents/forms/fields will also change.
- **Automated project-to-project sharing as desired**
Shared parts and processes can be reapplied to new projects as desired, eliminating the redundant and time-consuming task of creating and maintaining such commonalities separately. Communicate from planning to your SPC process to define characteristics and spec limits and consider what is actually happening on the shop floor.
- **A virtual workspace for everyone**
Far-ranging teams across the globe have real-time access to the same interactive cloud-based solution.
- **Easy document control and report generation**
Create, export and print customized reports using standard Microsoft applications.

CONCLUSION

Increasingly, today's progressive global manufacturers are implementing thoughtful, collaborative and comprehensive forms of front-end quality planning. With the right management tools on hand, Such an integrated and preventative approach to product design and manufacture has been proven time and again to be the key difference between a successfully executed project and a failed one. Moreover, proper quality planning does not generate added costs or heavier workloads; on the contrary, gains in quality and productivity together create an undeniable force in the continuing quest for clear competitive advantage.

<http://www.qualitymag.com/articles/92334-business-and-quality-planning-should-be-integrated>



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