

Radically Accelerating Change Management

Optimizing the Change Process is Critical to Successful Product Development

Change has always been a reality of product development. Yet, with the pace of competition today, manufacturers can no longer afford the delays and costs related to 'traditional' change management practices. The fact is, companies that react to change quickly are winning, companies that can't are fading fast. This brief white paper explains the proper steps for optimizing your change process to improve your competitive edge.

Change is fundamental to product development. The process of taking market requirements, customer requests, and innovative ideas and turning them into viable products is impossible without managing change. While informal changes are acceptable early in the conceptual design process, they become complicated and expensive after the product has been released to manufacturing.

That's where Change Management comes in. By definition, Change Management is the process that controls how change is proposed, evaluated, implemented, and released.

A responsive and efficient change process can improve product quality and enhance the company's ability to compete. Conversely, an inefficient and cumbersome change process can cause serious scheduling and delivery problems that can negatively impact the bottom line.

Understanding the Challenges in Today's Change Process

For most companies, the problems with managing change derive from two key areas: too many unnecessary changes caused by cross-functional misunderstandings; and too many well-intentioned changes made in later stages without adequate consideration of their negative impact to the product's functionality, performance, quality, manufacturability, sourcing, cost or schedule.

The challenges of change management are not new. Historically, most companies have simply accepted the pain because they don't know how to eliminate it. Many of the challenges stem from the fact that employees either do not clearly understand the change process or simply ignore it.

Often, a company's change management system is bureaucratic, manual, and slow, which either creates the need for heroic measures, or encourages renegade behavior, whereby engineers are forced to expedite critical changes to keep production going using resources that should be deployed for other needs. Moreover, when change processes are bypassed in order to meet production demands, valuable design history is lost, which increases the likelihood that even more mistakes will be made in the future.

Without a formal change management process, changes are easily lost in the system, requiring team members to spend valuable time searching multiple data sources and different systems to track down and determine the history and impact of a change.

The challenges of an inefficient change process often force a manufacturer to shift focus and divert valuable resources away from areas of more critical need, which ultimately leads to wasted labor and missed delivery dates.

Change Management Matters:

Leaders have fewer late changes

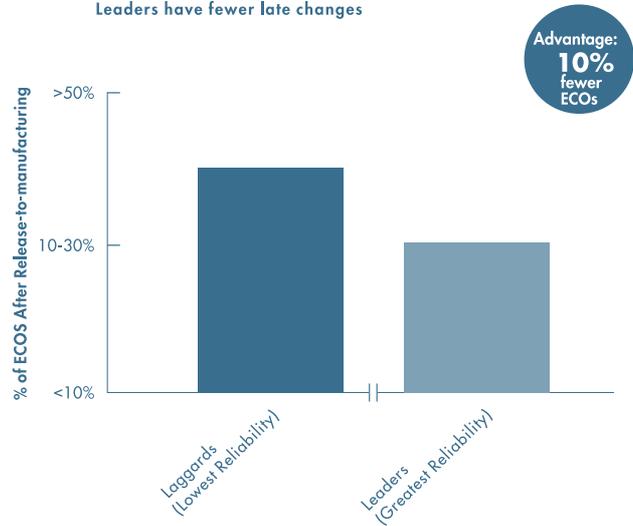


Figure 1 Companies having better reliability make fewer changes after Release-to-manufacturing—where impact and cost are highest

Everyday Change Issues

—Have you ever...

- Submitted a change, only to learn later that it was already being addressed by another change?
- Had a difficult time locating all the necessary information to perform an engineering change analysis and evaluation?
- Found it difficult to determine the status of a change?
- Lacked visibility into the history of past changes submitted and/or implemented for a part?
- Implemented a change without understanding its true impact until release to manufacturing?
- Had difficulty implementing a change that impacts multiple items managed across different systems?
- Had problems coordinating activities across multiple locations?
- Missed a schedule date because of lost or delayed changes?

If you answered yes to any of these questions, you need to learn how to optimize your change process.

Optimized Change Process: Nine steps

Regardless of what triggers the need for a change, there are generally four phases of activities to submit, approve, and implement a change. First, the problem must be identified, validated, and reproduced, and a solution to the problem must be recommended.

Second, companies must 'disposition' the change: Do you implement the change or not? While the information necessary to make this decision varies widely, some due diligence is required in the form of asking questions:

- Is the problem consistent and reproducible?
- Is there a feasible solution to the problem?
- What is the cost and benefit of fixing the problem with the identified solution?
- Does fixing this problem make good business sense for the company?

Third, there are many kinds of data needed to create a complete representation of the product: product specifications, technical publications, marketing plans, heterogeneous mechanical and electrical CAD models, simulation results, production plans, viewables, and more. This data must be examined to determine the impact of the change so the change can be planned. Documentation should be updated to reflect the change, and then used to implement the changes to the product. Often, planning and scheduling this activity is done to understand when resources will be required to implement the change to the product.

Fourth, the change must be made to the product, in both the digital and physical representations, to properly address the problem that initiated the request for change. This involves many groups, such as purchasing, manufacturing, or fabrication. Again, planning and scheduling these activities is commonly done to minimize the interruption to current fabrication and manufacture of the product.

The image below (Figure 2) provides a brief overview of the nine steps of the Enterprise Change Process. In brief, there are two main tracks through the process: Fast Track and Full Track. The Fast Track is for changes that are determined to have a low impact. This category of changes does not require review by a change board or multiple approvals and signature cycles. A more expensive change will take the Full Track process. In this more robust process, the steps required for approval and implementation are closely monitored and controlled because the impact of the change is greater. Typically, the decision criteria for the Fast Track and Full Track processes are established such that 80% of the changes take the fast track process branch.

These two tracks only differ in the steps they use in the middle of the process where a branch is represented. Fast Track uses Step 4, while Full Track uses Steps 5 and 6. Outside of that difference, all other steps are common between the two tracks.

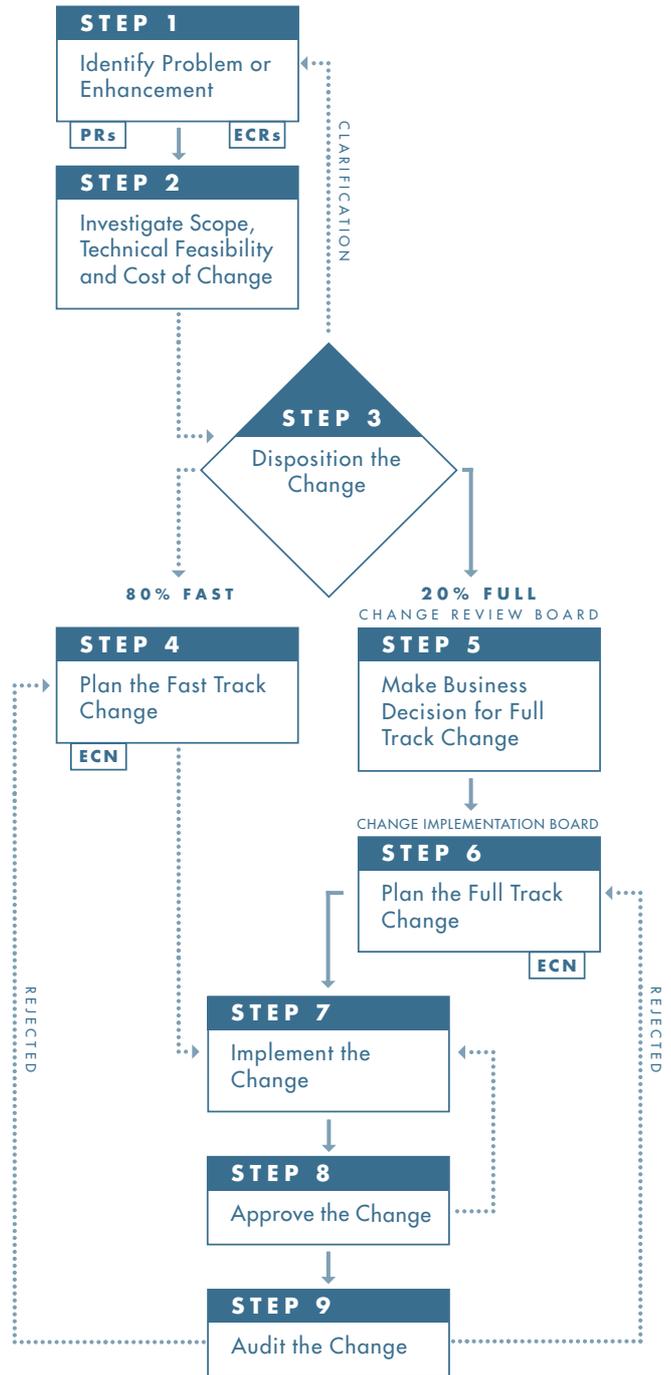
[Note: These steps and activities are described in much greater detail in the PTC Change Management Business Process Guide. The guide documents recommended methods and techniques for managing change.]

Change for the Better

Optimizing the change management process can create significant value for manufacturers. Key business benefits include:

Responsiveness

- Reduced engineering change cycle time (time to market) by 60-85% (1)
- Increased quality through greater number of change iterations
- Increased visibility to changes across the supply chain



PR-Problem Report
 ECR-Engineering Change Request
 ECN-Enterprise Change Notice

The Nine phases of the change management process – Steps 5 and 6 are Full Track; step 4 is fast Track, all other phases are the same for each track.

Lifecycle cost

- Reduced manufacturing scrap and rework [by 10-30%] from using obsolete information (3)
- Reduced number of expensive late-stage changes by 70% (6)
- Reduced volume of engineering changes by 25% (2)
- Decreased number of unauthorized or informal engineering changes
- Reduced cost of regulatory compliance

Productivity cost

- Reduced cost (labor) to perform an engineering change by 25% (2)
- Reduced redundant data entry by 50-70% (4)
- Reduced search time spent for impact analysis by 20-50% (5)
- Reduced time spent implementing engineering changes by 15-25% (5)
- Reduced time to track and report on engineering changes by 40% (6)
- Reduced workload for product configuration management

PTC – Uniquely Qualified

The need for ‘change’ in Change Management is clear. The difficulty of finding accurate documentation regarding many aspects of a change— i.e., the recording of a proposed change, the impending impact of the change, and the complete change history—all leave a company open to repeating mistakes.

To resolve these issues, PTC, the leader in Product Lifecycle Management (PLM) solutions, offers a solution that makes the change management process both reliable and repeatable. PTC’s Product Development System not only provides the tools necessary to manage all product changes throughout their lifecycle, but it also provides an out-of-the-box option for a best practice enterprise change management process.

The change management capability within PTC’s Product Development System provides an automated, closed-loop process that enables all product development stakeholders to instantly access all necessary data for evaluation, review, approval and implementation. Any team member can easily assess the impact of a change and effectively plan and manage its implementation. Team members can view a complete audit trail documenting the change history of the information—all of which reduces the likelihood of costly mistakes.

To ensure that resources are applied to the right effort, changes are controlled and routed through the closed loop process to the appropriate parties based on the severity of the change. With the fast track and full track options, lower impact changes pass quickly through the system without bogging it down, and higher impact changes receive the scrutiny required by their associated higher cost.

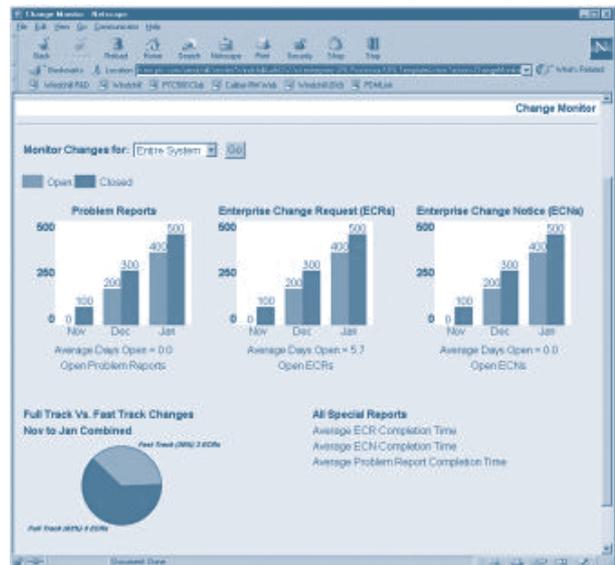


Figure 3: The Change Monitor displays the status of problem reports, change requests and change notices.

Most importantly, managers, administrators, and participants in the product lifecycle require the ability to monitor the status of the change system to ensure that the process is running smoothly. The Product Development System provides a graphical view of the health of the change system on a single Web page, called the Change Monitor. This display allows the viewer to measure how well they are managing the change process and highlights potential bottlenecks and isolating stalled processes. With an efficient change process and supporting tools, managing product change can become an asset to a company’s product development process rather than a liability.

With the experience gained from working with more than 5,000 leading companies in a variety of manufacturing industries, PTC understands how to leverage technology appropriately to ensure full support for optimized processes that can be successfully implemented and adopted throughout your organization.

For More Information

To learn more about optimizing your change management process through a Change Management Assessment or to receive a detailed Change Management Business Process Guide, call your local PTC reseller or sales representative or contact us to find a representative at www.ptc.com/company/contacts/index.htm.

1 Giga, 2 CIMdata, 3 Accenture, 4 Bearing Point, 5 University Study, 6 PTC Analysis

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