

# IS THERE A BETTER WAY TO MANAGE PRODUCT DEVELOPMENT PROJECTS?

White Paper

## EXECUTIVE OVERVIEW

The last three decades have seen an explosion in project management software tools and certifications for project management methodologies. Terms like agile, resource management, critical path analysis, risk mitigation, etc. are now commonplace throughout the corporate world. However, has all of this attention to the project management discipline resulted in product development executing as planned? For too many companies, the answer is still a resounding “No.”

A recent study by Engineering.com (“Product Development and Project Management Tools,” December 17, 2015) indicates that there is a significant gap between how manufacturing companies value specific aspects of their project execution and how they judge their performance. Specifically, the study looked at 4 main aspects of managing product development projects:

- Executing the simultaneous launch of multiple variants of a product
- Understanding how requirement changes affect a project’s schedule and resources
- Obtaining accurate and consistent project task updates with proof of completion
- Identifying product development issues that are causing project delays

Across all industries, survey respondents judged their abilities in each of these project management activities to be significantly less than their importance for executing a project successfully. However, it was found that if a respondent combined their project management methodologies with a web-based Product Lifecycle Management (PLM) solution, they judged their performance to be significantly higher. In order to address these 4 challenging aspects of product development projects, it was concluded that a PLM solution with embedded project management can uniquely provide the following operational best practices:

- **Full alignment between projects and the product portfolio** in order to leverage common technology platforms and launch products to market faster
- **Coordination of a project’s schedule and resources with its scope** as defined by requirements and development constraints in order to meet market expectations
- **Automatic updates of project tasks** as development work is completed to have a real-time understanding of project status and progress
- **Mitigating project risks based upon real-time status of product development** – designs, change orders, defects, etc. – in order to stay on schedule and within budget

## ALIGN DEVELOPMENT PROJECTS WITH THE PRODUCT PORTFOLIO

Perhaps the best way to ensure that product development projects achieve schedule and cost targets is for the projects to take advantage of common technologies. To illustrate this concept, suppose a “toy bear” company plans to launch 3 variations of its “teddy bear” line and 2 variations of its “panda bear” line in different sizes and/or colors. One project management approach would be to launch all the variants serially as shown in the figure below:

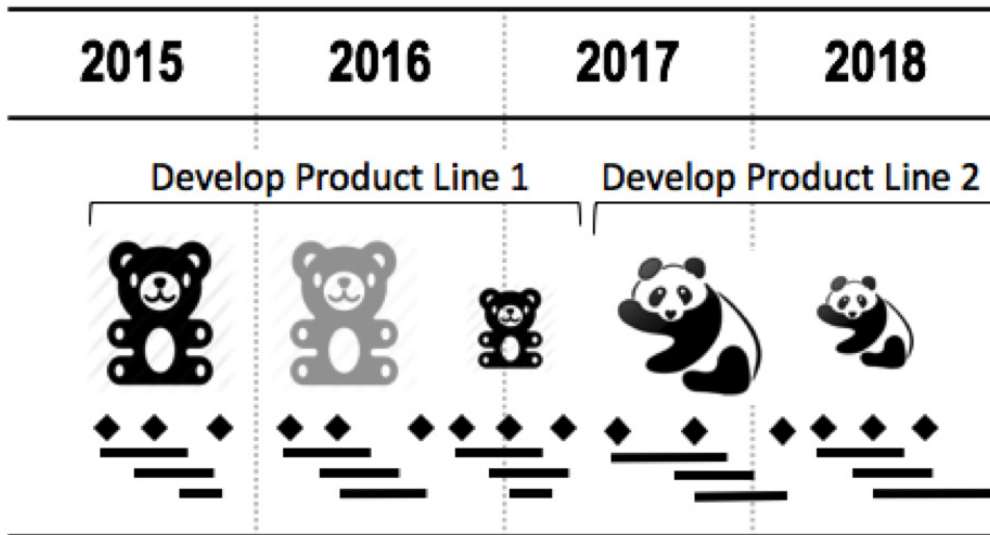
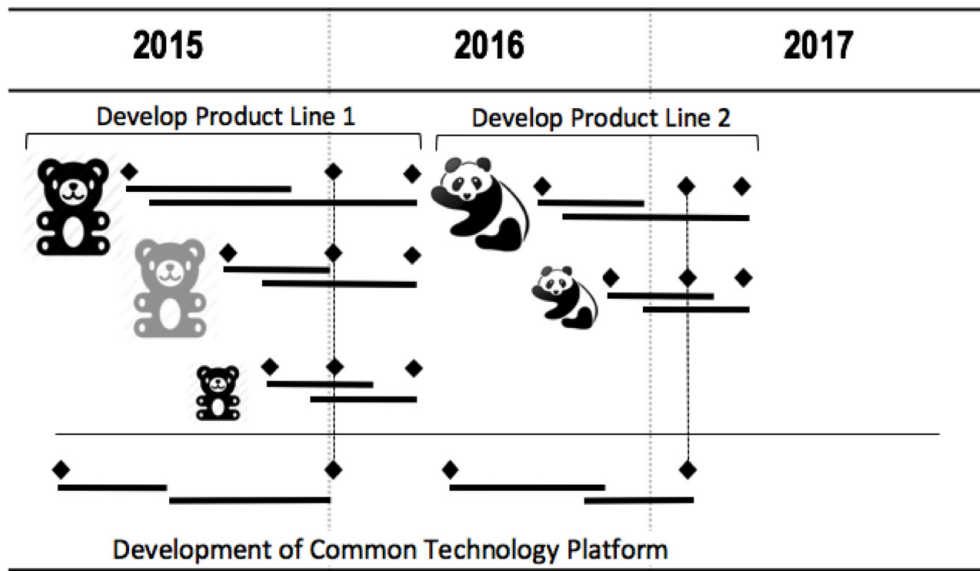


Figure 1:  
Serial Product Development

From a product development perspective, there are clearly shared technologies between the variants of each product line. With the serial approach to development, there may be unnecessary rework as this shared technology needs to be updated for each subsequent project. A serial development approach also gives the competition an understanding of where the entire product line is heading before all variants are ready to launch.

A more efficient product development approach is to plan to launch an entire product line at once with work also organized to develop and update a common technology platform that is leveraged across both product lines. Dependencies exist between the variant and common technology projects in order to stay aligned as shown in the figure below:



**Figure 2:**  
Product Development of Entire Product Line w/ a Common Technology Platform

By developing and launching all variants of the entire product line together, the first variant may not be available as early as when the serial development approach was chosen. However, the entire product line will launch earlier and the competition will be boxed out from the market better.

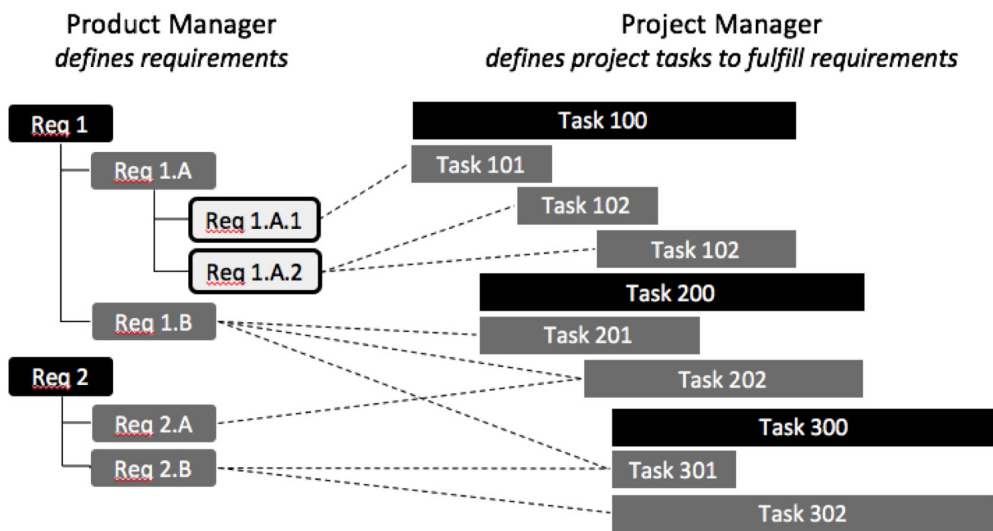
To effectively execute product development of an entire product line with a common technology platform, effective product management is needed in addition to project management. A PLM system allows product managers to define a product line’s variants with the required features (or product capabilities) that must be delivered to satisfy customer needs or requirements. Project managers then use this detailed understanding of what must be delivered to market to plan project tasks for the common technology platform and each product line variant. While this alignment can occur with a project management system separate from PLM, having a PLM system with embedded project management functionality provides the deep traceability to provide the remaining 3 best practices.

## COORDINATE A DEVELOPMENT PROJECT'S SCHEDULE AND RESOURCES WITH ITS SCOPE

This understanding of the product's market goals influences the scope of the project or what must be delivered. Project managers must fully understand the scope in order to determine an appropriate schedule and resource assignments. Scope is constrained by business factors such as cost and the availability of resources with necessary skill levels. As such, project managers have two choices: (1) properly respond to scope changes with adjustments to the schedule or resource assignments, or (2) determine permissible changes to scope in order to meet due dates or address resource limitations.

All project management methodologies assign resources to tasks in a schedule. Project management software provides various levels of resource management, but most companies require basic resource leveling while some may use processes for requesting and assigning resources based on required project skills. Where most dedicated project management software fails though, is trying to coordinate resources and schedule with the scope that must be delivered. Typically, the definition of the project scope, or the requirements of its corresponding product, is done separate from the project management system. As such, while it is straightforward to align resources and schedule to the initial scope, projects fail as requirements change. The best project management solutions provide complete visibility and access of a product's requirements to the project team. Then, project managers can properly assess the impact of requirement changes. Conversely, if meeting deadlines or alleviating over-assigned resources requires de-scoping, then a project manager can work with a product manager to assess the business impact across all affected products.

Beyond just providing requirement visibility, product managers must be able to decompose requirements into increasing levels of detail in order to best correspond to how the requirements will be fulfilled during product design and engineering. With this level of granularity, it is then possible for a project manager to associate requirements to specific project tasks based on the assignee's role and expected deliverable as depicted in the figure below:



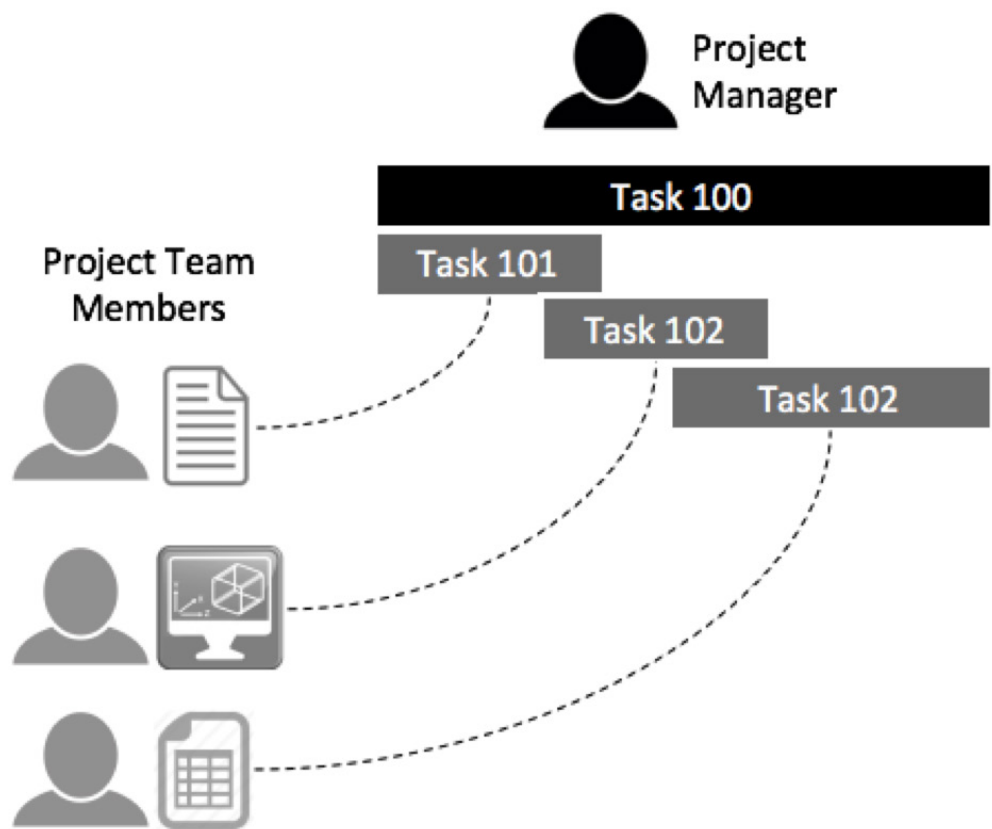
**Figure 3:**  
Requirements Associated to  
Project Tasks for Scope  
Traceability

Traceability between the requirements and the project tasks allows the project manager to address proposals to requirement changes. He immediately can determine the impact to the project schedule and/or resource assignments with the skills necessary to fulfill the requirements.

## AUTOMATIC UPDATES OF PROJECT TASKS

Project managers are often disconnected from the actual work being performed. As such, they are often at the mercy of the project team members to accurately communicate the status of their assigned tasks. However, how often do project team members have the same assessment of their progress or the quality of the work done? Of course, this hardly ever happens. It is human nature for most people to say they are further along on a job with higher levels of quality than is really the case. So, the project manager's roll-up of overall project progress has much uncertainty in it.

An ideal solution eliminates manually communicated updates between a "doer" and a "manager" and the project task status is updated automatically as work is completed with full traceability to the work performed. This can be thought of as governing or managing a project "invisibly." The best solutions base the project task status upon the actual work content being delivered with the necessary review and approval process to indicate completion. For instance, a designer's task may be based upon the completion of a CAD model. The assigned task is not "done" until the CAD model is vaulted and promoted through its lifecycle with peer reviews. This concept is depicted in the diagram below:



**Figure 4:**  
Automatically Updating Project  
Task Status As Work Is  
Completed

When project tasks are directly associated to the work performed, the overall project status is updated automatically. Instead of relying on weekly status meetings or email updates, the project manager can investigate status in real time and also assess the quality of the work delivered. In order to get the best results, completing a project task should not require excessive steps or time. Otherwise, the results may be as poor as the weekly status meeting approach. In order to obtain the timeliest project status, updates should be made from the software that team members most commonly use to perform their jobs. Examples of this would be making project task assignments accessible directly from a CAD tool or common workplace software such as Microsoft Outlook®.

## **REVEAL RISKS BASED ON REAL-TIME PRODUCT DEVELOPMENT STATUS**

Successfully associating product development deliverables with the project schedule leads to the final best practice, which is the ability to reveal risks based on real-time information. When a project manager is able to fully investigate why a task is late by reviewing the work that has been performed, an opportunity exists to identify other potential problem areas in the product that may have not been exposed yet via the updating of project tasks.

It is well known that as a development project progresses, the cost of resolving an issue increases because decisions are physically locked in. When an issue is discovered during requirements or early design, resolving it is simply a matter of reaching an agreement and updating electronic data files. When issues are found during testing or in operations, an issue's resolution may require changing machinery that has already been built, re-designing a product, etc.

So, how can the choice of project management software impact how issues are revealed and resolved? Think about how the best practice of automatic task updates was described. Tasks were just not being marked as complete—they were completed as actual product development content was vaulted as a deliverable to the task. This provides the project manager with incredible insight in regards to the true status of his project. Suppose a project task was late and the project manager was able to easily investigate the design file associated with it and all the decisions and/or issues generated during its lifecycle? A project manager may be able to recognize how the same issues affect other aspects of the project and take pre-emptive steps to avoid the risk entirely.

By having a PLM system with embedded project management capabilities, the project dashboards can provide a real-time summary of what is actually occurring in product development. The progress of summary phases is calculated and updated as deliverables are completed to close out project tasks. Project managers gain insight based on the real development progression, rather than interpretations created and compiled during weekly meetings.

Once a project issue is identified, the project manager can then further assess what is happening in product development. For instance, the dashboard could include metrics such as the number of parts under development and open change requests that must be completed. The project manager can explore information that has been captured during design reviews and determine whether a problem in one area of the product's design may impact other areas that have yet to start development. This is only possible because the product development and project management solutions are unified with a single system and methodology.

## CONCLUSION

The Engineering.com survey revealed that there is a big gap between the importance companies place upon some project management activities and how effectively a company is able to perform these activities in order to successfully execute their product development projects. Better education in project management methodologies and standalone software tools will not allow a company to perform these activities at their highest level. Only a PLM system with embedded project management capabilities will allow a company to fully achieve the following best practices:

- **Connect project deliverables with the product portfolio** to execute the simultaneous launch of multiple variants of a product
- **Coordinate schedule and resources with a precise definition of scope** in the form of requirements in order for the impact of requirement changes to be properly assessed
- **Manage project tasks in-context with team members' common work environment** in order to get real-time and consistent project task updates with proof of completion

And finally ...

- **Provide traceability to product development data in order to reveals risks** and enable the identification of issues that may result in project delays.

There will be pressure to pursue solutions with a lengthy list of advanced project management capabilities. While there is a baseline that a solution must provide, there are diminishing returns from the most advanced capabilities. Do not place excessive priority on these seldom used capabilities at the expense of fully realizing the best practices discussed in this paper. Instead, stay focused on the unique value provided by a PLM system with embedded project management.

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