

The Key to Recovery through New Product Development: Office Worker Productivity

For many manufacturers, accelerating out of the recession will depend on making decisions and contributing deliverables right the first time, earlier in the process and faster than ever before. However, the advanced capabilities of Product Lifecycle Management systems (defined in sidebar on page 2) needed by more technical stakeholders have introduced a complexity that inhibits less technical stakeholders from accessing and contributing to the product record (defined in sidebar on page 2) in real-time. This report details a new integration approach for PLM systems to allow less technical stakeholders to work with the product record in familiar desktop applications.

Understaffed Projects and Tighter Schedules are the Barrier to Revenue Growth through New Product Development

There's never been a more critical time for stakeholders in product development to perform than right now. After a harrowing recession took many a manufacturer to the brink of bankruptcy, signs of a promising if slow recovery are emerging. However the budget cutting initiatives that helped manufacturers survive the recession won't provide new revenues in the recovery. Put simply, cost control isn't a growth strategy. Instead, innovative new products offer a time proven path to profitable growth.

For organizations involved in product development though, it's no simple task. The recession forced many to cut far more than fat out of organizations; leaving many product development projects understaffed. Furthermore, the trend towards compressed schedules to meet tighter product launch windows hasn't let up. Overall, there's less room for error than ever before. Manufacturers realize that product development as usual won't suffice. As a result, manufacturers generally have two goals.

- 1) They want to make the decisions or finish deliverables **right the first time** as well as **earlier in the schedule**. Doing so let's them avoid downstream errors where they are far more costly and time consuming to address.
- 2) Also, they want to **execute product development faster**. This let's them meet the demanding schedules laid out to capitalize on market opportunities and beat competitors to market.

For engineering organizations as well as other departments that participate in product development that rely on office workers creating deliverables, the emphasis has returned to productivity.

From Recession to Recovery

Per the [National Bureau of Economic Research \(NBER, wikipedia entry\)](#) as of September 2010, the U.S. economic recession ended in June 2009 and is now in a slow but steady recovery. Details of the full report can be found at the NBER site [here](#).

The Historical PLM Conundrum: Providing Centralized Management and Accessibility of the Product Record

Regardless of how desirable an organization's goals may be, it doesn't mean they are easy to achieve. Making decisions and finishing deliverables right the first time, earlier in the schedule and doing it all faster requires the right information at the right time for the right stakeholders. For product development, that means providing real-time access to a product record that is up-to-date and accurate. Doing so means moving away from desktop file management and shared drives where different users could end up looking at different versions of a single deliverable and make the wrong decision. Instead, some organizations centrally manage their product record with a Product Lifecycle Management (PLM) system.

However, just because the data and information in the product record is centrally managed doesn't necessarily mean that it is readily accessible for all. PLM systems provide deep functionality needed for the tasks of more technical stakeholders who use Computer Aided Design (CAD) and Computer Aided Engineering (CAE) software. Due to their day to day work with these more complex applications, they readily learn and use fully functioned PLM systems. In contrast, less technical stakeholders perform much of their day-to-day work in document, presentation, spreadsheet, email and calendaring applications. In fact, a majority of manufacturers are standardized on Microsoft ([wikipedia entry](#), [corporate site](#)) Office (Word, Excel, Powerpoint, Visio and Outlook). These stakeholders are less willing to use the more complex capabilities of PLM systems.

What's wrong with this scenario?

Both of these types of stakeholders need to access and contribute to the same product record. The reluctance of less technical stakeholders to use PLM systems can undermine the efforts to do that.

What is a Product Record?

The Product Record is composed of all of the data and files that collectively define a product across its lifecycle including engineering, sourcing, manufacturing, services and other phases, not just 3D models, drawings and the Bill of Material. For more detail, refer to the product record series of posts ([part 1](#), [part 2](#) & [part 3](#)) on the [engineering-matters.com](#) blog.

What is Product Lifecycle Management (PLM)?

Product Lifecycle Management (PLM) is a software system that both manages various aspects of the product record as well as enables and automates the product development process. For more detail, refer to the [PLM entry at wikipedia.org](#).

Teradyne Runs on Spreadsheets and Documents

"I think we live in excel," laughs Bill Duggan, Engineering Project Lead at Teradyne. And actually, he's not trying to make a joke.

To support the 'go' or 'no go' decision at each of the five gates in their Phase-Gate development process, the organization creates numerous checklists and other gate specific documents calculating various metrics like earned value and slippage rates. In their system engineering procedures, they initially capture the requirements in a tool but many still use a document to capture and develop the requirements specification document. This document is broken into several sub elements like the system requirements specification, software requirements, hardware requirements specifications. The status of the development is managed in excel spreadsheets among other tools. They also create block diagrams of functional architectures that are also decomposed. And these are just two examples of how documents are used in their development processes.

"We have a huge variety of documents, spreadsheets, diagrams and schedules in just about every single engineering department in the company," states Bill. "We have many CAD files, but engineering is heavily dependent on documents."

(Excerpt taken from [Teradyne entry in wikipedia](#)). Teradyne ([NYSE: TER](#)), a US company, is a supplier of automatic test equipment with revenues of over \$1B.

A Fresh Approach to Accessing a Centralized Product Record: PLM Integration with Desktop Applications

Fortunately, some solution providers are turning the paradigm of accessing and contributing to a centralized product record in a PLM system on it's head. Instead of making less technical stakeholders log in and navigate the PLM system, the idea is to deliver the relevant aspects of the product record from the PLM system to the desktop. There they can use more familiar applications to view or modify that information as necessary.

One such solution provider is Siemens PLM Software ([Siemens PLM entry in wikipedia](#), [Siemens PLM corporate site](#)). Noting the proliferation of the Office products from Microsoft ([Microsoft entry in wikipedia](#), [Microsoft corporate site](#)), Siemens PLM developed an integration between their Teamcenter PLM system and Microsoft Office (Word, Excel, Powerpoint, Outlook and Project applications). This offers access to the product record that exists within Teamcenter to less technical stakeholders through their desktop applications. It provides them insight into the real-time dynamic status of development efforts and, as a result, they have real-time access to the product record enabling better decisions earlier in the product development process.

The ability to access the product record in real-time, however, isn't the only need for less technical stakeholders. They also need to contribute to the product record by creating or modifying new product related deliverables. To address this need,

Siemens PLM extended the integration between their Teamcenter PLM system and Microsoft's Word and Excel products to include a 'live' exchange of data. As a result, modifications made to documents, tasks or schedules associatively updates the product record in the Teamcenter PLM system. This allows less technical stakeholders to contribute to the product record without the overhead of learning how to use new software systems. The following are a number of scenarios where this technical capability applies.

- ♦ **Systems Engineering:** Requirements are commonly created in documents or spreadsheets and then managed on individual's desktops. The integration allows system engineers to 'publish' their requirements and allocations, where other non-technical and technical stakeholders can take action.
- ♦ **Schedule and Task Management:** Project plans are commonly laid out either in spreadsheets or project management applications with sequenced tasks, commonly associated with creating or modifying digital deliverables. The integration enables project managers to use familiar desktop applications without knowing the technicalities of a PLM system. Team members can receive and complete their task assignments in desktop applications.
- ♦ **Bill of Material (BOM) and Configuration Management:** Changes to BOMs must be closely monitored and managed as it directly impacts sourcing and manufacturing activities where hard capital is committed. The integration allows non-technical stakeholders to edit BOMs and product configurations with the changes propagated to the PLM system in an automated fashion.

Document Enabled System Engineering at ATK

The traditional responsibilities of a [Systems Engineer \(wikipedia entry\)](#) are to decompose requirements, allocate them and finally to validate that they are fulfilled once the design is complete. At ATK, system engineers have performed these responsibilities with Word documents and Excel spreadsheets for years. With hundreds of requirements and thousands of parts, it often took brute force to manually propagate change to requirements.

With the integration between Siemens PLM's Teamcenter and Microsoft's Word and Excel, their procedural workflow has changed. They now import and export their specifications and requirements lists as necessary and the changes are propagated in an automated fashion. As a result, the burden of making sure everything is in synch is transitioned to the PLM system. That means they can focus on what's really important: managing requirements, not documents.

(Excerpt taken from [ATK entry in wikipedia](#)): Alliant Techsystems Inc., commonly known by its ticker symbol, [NYSE: ATK](#), is one of the largest aerospace and defense companies in the US with more than 18,000 employees and 2010 revenues in excess of an estimated US\$4.8 billion.

Summary and Conclusions

- ◆ The cost controls that helped manufacturers survive the recession won't help them grow during the recovery. New product development is needed to drive revenue growth, yet layoffs from the recession and tightening schedules present significant barriers to success.
- ◆ Accessing and contributing to a centralized product record is key to making decisions and finishing deliverables right the first time and earlier in the product development process.
- ◆ The advanced capabilities of a PLM system needed to support more technical stakeholders using CAD and CAE applications have introduced a complexity that challenges less technical stakeholders.
- ◆ New integrations including 'live' exchanges of data between PLM systems and desktop document, spreadsheet, calendar and email applications enable less technical stakeholders to access and contribute to the product record through the tools they use every day. These integrations provide advantages including:
 - ◆ Reduced training costs and short learning curves.
 - ◆ Wider and broader participation in the product development process.
 - ◆ A fuller and more consistent product record.

Recommendations and Next Steps

- ◆ Understand where and how your company's product record exists in terms of different systems, shared drives and desktops.
- ◆ Identify what desktop applications are most commonly used in different parts of your product development process. Categorize them into CAD and CAE heavy parts and more office oriented sections.
- ◆ Investigate new integrations between PLM systems and the simpler desktop applications. Explore which sets of stakeholders that are currently operating independently of a PLM system would be more tightly integrated into the product record and the product development process.

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