

# SharePoint and PLM

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SharePoint is poised to become an ubiquitous document and content management system with great capabilities for ad hoc collaboration, whereas Product Lifecycle Management (PLM) is a similar but more structured system focused on product development content. By integrating SharePoint and the Product Data Management (PDM) component of PLM, users can blend the benefits of both to enable ad hoc collaboration on top of rich, structured product data and information – possibly gaining synergies that neither system is capable of independently.

## INTRODUCTION TO SHAREPOINT

SharePoint is a Web-based collaboration, document and content management tool from Microsoft. SharePoint can, for example, be used to host Web pages to disseminate information or for team members to collaborate on documents and topics displayed on the Web page. SharePoint is tightly integrated with other Microsoft products such as Active Directory, Outlook, and Office to provide users with a somewhat transparent user experience.

SharePoint consists of a database engine (SQL Server), a Web engine for page and form presentation, and a robust search engine. Microsoft provides a number of out-of-the-box site templates for activities including:

- Task management
- Contact and calendar sharing
- Document management and revision control
- Collaboration via wikis, blogs, and discussion boards
- Rudimentary workflow management

SharePoint is built completely on the Microsoft .NET Framework, meaning that it can be enhanced with Visual Studio programming. Common enhancements include the creation of Web parts to

connect to, expose data in, and interact with external systems like ERP, PLM, or CRM. The .NET Framework foundation allows SharePoint to be integrated with the Windows Workflow Foundation (WWF) for the creation of complex workflows or the Windows Communication Foundation (WCF) for integration with instant messaging tools such as Live Communication Server (LCS) or Office Communication Server (OCS). SharePoint is also tightly integrated with Active Directory for user management, authentication, and authorization.

SharePoint's capabilities are wide but not necessarily deep. There are very few things that you can't manage in SharePoint. However, SharePoint does not typically have a depth of understanding related to file relationships (like the deep CAD integrations found in typical PDM systems) or the complex structures intrinsic in BOMs or product structures.

## INTRODUCTION TO PLM AND PDM

Product Lifecycle Management is the suite of tools used to manage the entire lifecycle of a product from conception through design and manufacture, to service and disposal. The tools are intended to manage the product, the processes around the product, and any other Intellectual Property (IP) associated with the product's lifecycle. PLM is one of the cornerstones of an engineering or manufacturing company's information technology infrastructure. Typically, engineering and manufacturing companies need these key business systems to operate successfully:

- Communications (email, instant message, etc.)
- Delivery/Execution System (ERP, MRP, MES, SCM, etc.)
- Financial/Accounting System (ERP, accounting, etc.)
- Document/File/Content Creation and Management (PLM, CMS, office applications)

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PLM is intended to manage a specific part of a company's business; the information related to its products. Information related to a company's product could include documents, Computer-Aided Design (CAD) files, workflow processes, bills of material (BOMs) and project definition. Much of this product data is rich in structure and relationships. It is, therefore, no surprise that the cornerstone of most PLM platforms is a Product Data Management (PDM) system. PDM systems manage the files and records (including history of both), and relationships among those files. In that PDM is structure-focused, PDM products tend to have deep integrations with other systems like CAD, ERP, Microsoft Office, and project management tools. These deep integrations allow PDM to extract and share complex data with the integrated systems. For example, a PDM system will likely be integrated with a company's CAD platform and, therefore, be able to extract parametric relationships or physical properties from the CAD models. Or, due to its tight integration with an ERP system, the PDM product can share multi-level BOMs bi-directionally, communicating about item quantities, costs, etc.

PDM systems typically have a relational database engine (generally one of the industry-standard SQL database like SQL Server, Oracle, or DB2), a file vault for the securing of files, and viewing engines, which allow process participants to view, markup and collaborate on content. Because individuals from outside of the company frequently contribute to product definition (partners in the supply chain or design chain), a PDM system will typically provide a Web-based interface for secure access to product-related data.

## COMPARING SHAREPOINT AND PDM

Although the topic at hand is SharePoint and PLM, the noteworthy comparison is between SharePoint and PDM. PLM encompasses content creation as well as management, whereas content creation in SharePoint is mostly textual and, therefore, trivial in this discussion. Thus the comparison of content management capabilities is the focus here, and PDM is the content management element of PLM.

## UNIQUE VALUES OF SHAREPOINT

SharePoint is a bit hard to describe or categorize in terms of IT systems. The platform includes document management capabilities, web publishing capabilities, discussion thread management, a wiki toolset, and a blogging toolset, but it is in many ways a framework for development. Since SharePoint "sites" can easily be set up and configured by users, and different content types (lists and libraries, for example) can be combined in very flexible ways, SharePoint can be a de facto visual development tool with which users can quickly set up their own knowledge capture and collaboration areas.

This inherent flexibility and the platform nature of SharePoint mean that the product has some intrinsic strengths when managing product-related information. Specifically, SharePoint is very strong (much stronger than PDM, in fact) at:

1. *Ad hoc* collaboration
2. Unstructured knowledge capture
3. Transparent user interfaces

For *ad hoc* collaboration, several key capabilities make it easy for any authorized user in SharePoint to define a flexible and collaborative workspace. Multiple users can contribute to a single topic or line of discussion via:

- Wiki contribution
- Discussion thread contribution
- Revision control of list items or files
- Synchronization of OneNote Notebooks

The owner of a SharePoint "site" can add any or all of these mechanisms to a purpose-built workspace for collaboration on one or more topics.

This flexibility contributes to SharePoint's ability to capture unstructured knowledge, but SharePoint's advantage in this area does not stop there. SharePoint can manage Excel data in at least three different ways: revision management of the file itself, import of Excel data into a SharePoint list, and exposure of a spreadsheet via Excel Services. Given the prevalence of spreadsheets within today's enterprises for capturing anything and everything, this ability to expose and share

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knowledge quickly, and in distinct modes, means that the knowledge is more likely to be captured (than left in opaque network directory structures). Note though that only unstructured knowledge is handled well through this mechanism. There are no particularly efficient ways to capture, manage, and expose complex, structured data (like BOMs, project timelines, requirements trees, FMEAs, etc.) except through basic file management. There are signs that Microsoft is working on the presentation of structured information, but deep capabilities in this area are not present today.

The final unique value of SharePoint (relative to PDM) relates to the transparency of the system's interface. For those managing Microsoft Office files in SharePoint, it is almost impossible to tell that a product called SharePoint is involved. When using SharePoint's native interface, all elements of the interface are configurable, and typical web page formatting tools apply. Beyond the flexibility of the interface, the default screens are defined in a way that makes the interface as simple as the task at hand, whether that be adding a comment to a discussion, changing an item in a list, or uploading a file. Even when data from different systems needs to be presented (where the relationships among the data elements are complex and involved), the interface abstracts those details from the user (the details are managed via Web Part configuration in the backend).

### UNIQUE VALUES OF PDM

PDM systems are generally a collection of logic engines that enforce business rules around product data, product-related data structures, and product development processes. For example, PDM systems will often control and automate the steps required to evaluate and perform a change to a product definition, including modifications to drawings, models, BOMs, and manufacturing instructions. Typically, there are business rules to be enforced during these steps:

- The order in which departmental reviews of change proposals take place
- The number / level of approvals required for the process to proceed
- The users who are allowed to be involved in various levels of change

- The way in which specifications can be revised / replaced subject to the maturity of their related components
- The manner in which revision information increments for documents and BOM information as changes are applied
- The extent of change propagation through relevant BOMs where modified components are used

The list goes on, but from this sampling it is clear that these rules contain company-specific complexities and have a rich interdependence on each other (where a workflow/process engine may depend on component maturity information applied by a lifecycle/revision engine, for example). PDM systems are purpose-built to manage this type of complexity and, as such, are excellent at capturing structured information (like BOMs, requirements trees, project plans, etc.), and at processing that information subject to complex business rules (like those rules found in processes such as Engineering Change Requests, Engineering Change Orders, Manufacturers Change Notices, Change Control Board Reviews, New Product Introductions, etc.).

## SHAREPOINT AND PDM SYMBIOSIS

Although each system has its own strengths, neither is suitable for all enterprise purposes. PDM is not simple enough to be suitable for all enterprise users. SharePoint is not complex enough to manage the details of product-related processes. However, in combination, the two platforms are likely to recognize some synergy. Although not an exhaustive list, these are a few proposed synergies between SharePoint and PDM:

- Federate data between SharePoint and PDM (unstructured data in SharePoint, structured data in PDM) and present a simple interface to users via unified search.
- Use SharePoint's transparent and simple interface to present complex data in task-specific contexts, thereby making PDM data more accessible. Recognize that some data may need to be presented in SharePoint but managed in PDM.

The transparent user interface and ad hoc collaboration capabilities of SharePoint are married with the complex structure management and business process enforcement functionalities in PDM.

- Layer ad hoc collaboration tools on top of complex and structured PDM content to enable agile decision-making using complete and accurate information.

To be more practical, an example scenario is worth mentioning. For instance, a company might be considering a change to one of its products that is currently successful with a number of key customers. The owner of that product line (the change sponsor in this case) instructs a development engineer to work up a handful of improvement scenarios and to create draft deliverables of those (3D CAD models, sample BOMs, etc.) in PDM. The change sponsor publishes/exposes the best of these ideas from PDM to a secure SharePoint intranet where distributors access technical information about the company's products. Through the flexibility of SharePoint, the change sponsor sets up a collaboration "site" to propose the changes. Through discussion threads and blog postings, the development engineer, change sponsor, and a number of distributors and sales representatives interact using PDM content (CAD

models, BOMs, etc.) that is exposed in SharePoint. As the discussion progresses, the change sponsor collects enough comments and input to use as justification for an official Engineering Change Request (ECR). The ad hoc collaboration artifacts (distributor comments, sketches, mark-ups, etc.) are input from SharePoint into the detailed business ECR process managed by PDM.

## CONCLUSION

SharePoint and PLM each have unique strengths related to creating, capturing, and managing product-related information. However, neither is complete in the solution offered to product-centric enterprises. The optimal solution is a combination of SharePoint and PDM, whereby the transparent user interface and *ad hoc* collaboration capabilities of SharePoint are married with the complex structure management and business process enforcement functionalities in PDM. By combining these elements of the two systems, companies can recognize a valuable, symbiotic relationship for managing their products' lifecycles.

## ABOUT RAZORLEAF

Razorleaf is a services provider that helps companies become market leaders through the measured application of technology and best practices to existing business processes.

Razorleaf specializes in process analysis, implementation, training and support of enterprise technologies including Design Automation (DA), Enterprise Portal (SharePoint), Product Data Management/Technical Data Management (PDM/TDM), and Product Lifecycle Management (PLM) solutions.

With over 100 active customers and more than 200 implementations, our experienced team offers expertise in leading software from Actify, Aras, Autodesk, Conisio, Dassault Systemes, DriveWorks, infoStrait, Microsoft, Oracle, PTC, ShareVis, and Siemens. The company is headquartered in Ohio with satellite offices in Arizona, Florida, Georgia, Maryland, Michigan, New York, North Carolina, Pennsylvania, Texas, Virginia, and Wisconsin.

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