BUYER'S GUIDE: PANDING BEYON YOUR OUTGROWN PDM SYSTEM

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What to do When You've Outgrown Your PDM

What should manufacturers look for when it's time to replace their outgrown PDM system?

Our research shows a high correlation between elevated business performance and strong product data management capabilities.¹ Unfortunately, we find many manufacturers have already stretched the limits of what their basic Product Data Management (PDM) system can do. In most cases, it meets fundamental CAD management or engineering document management needs, but falls short beyond keeping data in control. What should they look for in a replacement PDM solution?





Introducing the Buyer's Guide for a More Capable PDM Solution

Exceeding the Limits of Basic PDM

Although our <u>PDM Buyer's Guide</u> recommends "considering both current and future needs" when evaluating solutions and "building a foundation to grow on," there are many valid reasons companies end up outgrowing their system:

- Product complexity has increased
- · Product development complexity has grown
- · Business has expanded
- · Business has globalized

Another common reason is that business realities or resource availability dictated a simpler solution. Regardless of the cause, it's time to make a change. Fortunately, a lot has also changed with available PDM solutions, particularly considering the cloud.

Understanding the Buyer's Guide Intent

This guide is designed to help companies understand when they've outgrown their PDM system and provides practical guidance on what to look for in a replacement solution. We won't repeat all of the basics covered in the <u>PDM Buyer's</u> <u>Guide</u>, but we'll highlight some of the key elements typically missing from less capable systems.

After we've covered the basics, we'll introduce some requirements for more advanced processes that most manufacturers look for after they've gotten their CAD data under control.



Basic Product Data Management Buyer's Guide Framework

Understanding the Buyer's Guide Structure

Like our other buyer's guides, we go beyond functional requirements to address implementation, adoption, vendor partner, and special considerations. We also touch on another recommendation from our PDM guide, specifically how manufacturers can make sure they don't hit another dead end with their new system as they evolve to become a more digital enterprise.



Top Ten Signs You've Outgrown Your PDM System



Where Basic PDM Falls Short

The core elements of PDM are the ability to control, access, and share product data. These can help companies avoid losing intellectual property (IP), prevent overwriting files, and enable reuse. Many PDM solutions meet enough basic requirements to help escape the chaos of ad-hoc and unstructured data management techniques, but lack the capabilities that let manufacturers improve engineering and product development performance. They typically don't support more advanced collaboration, configuration / BOM management, or project management capabilities that help companies take the value of PDM to the next level.

How to Know if Your PDM Isn't Enough

Some PDM systems are built as a foundation to build on, while others are either intentionally simple or haven't been enhanced as the industry has matured. There are some common signs that a PDM system is no longer meeting company needs.

Top Ten Signs You've Outgrown Your PDM System

Signs You're Ready for More Capable PDM

- 1 **Assembly Scalability** won't load, fails, or takes too much time to save your larger assemblies
- 2 **User Scalability** doesn't support the number of concurrent users, typically due to growth or more people outside of Engineering using it
- 3 **Multi-CAD Issue**s can't properly manage all CAD data, often because of multiple MCAD or need to manage ECAD or other formats
- 4 **Product Complexity** can't efficiently control a large number of product variants, too many levels in the BOM, or too many parts
- 5 **Manual Processes Failing** can no longer rely on naming conventions, part numbering, status by location, or other workarounds
- 6 **Engineering Centric** designed for engineers, doesn't really offer much to the rest of the company
- 7 **Internally Centric** no ability to work with suppliers, engineering firms, contract manufacturers, or customers without treating them like employees



No Casual User Support – the UI is too complex for anybody other than power users, no simplified access for people like management, suppliers, other departments



Poor Multi-Site Capability – replication failing, not robust enough, not available, or causes lag time and latency issues



No Cloud Option – even if you're not looking for it now, you should have the option. And if your vendor isn't thinking about a cloud solution, they probably aren't in it for the long haul

Recognizing the Signs in Your Company

Many manufacturers will relate with more than one of these issues and find it hampers their ability to innovate efficiently. On average, manufacturers waste 15% of engineers' time on non-valued-added data management capabilities.² An outdated PDM can make this worse. For those that recognize the need to move beyond their current systems, there is good news. It's easier to step up from a basic PDM system than implement one in the first place, and it's likely the evolution to the digital enterprise would likely demand a transition anyway. Let's take a look at what to look for when it's time to go beyond basic PDM.



Extending the Control – Access – Share Basics

Support the Basics of Product Data Management

The <u>PDM Buyer's Guide</u> establishes PDM criteria that allow manufacturers to effectively and efficiently:

- · Control: Control and secure product-related data
- **Access**: Improve the ability to quickly find and reuse information
- **Share**: Share product knowledge with teams outside of Engineering

Most PDM systems control the basics related to controlling, accessing, and sharing information. But many basic PDM systems are effectively Engineering Document Management (EDM) systems designed to manage CAD files. Those systems only meet a subset of the basic requirements in the PDM guide. This section shares a selection of capabilities that are typically missing. Companies can use these lists to focus on the features that differentiate more fully capable, enterprise-class PDM systems from more basic PDM / EDM systems.

Fill in the Missing Elements

As you'll see, a significant portion of the elements missing from less mature PDM systems follow certain themes, specifically:

• **Control**: One of the key differences in PDM systems, as the <u>PDM Buyer's Guide</u> cautioned, is the ability to support multi-CAD. Beyond that, the requirements differentiating more advanced solutions often fall into the categories of business process support or managing today's more complex, smart products.

PDM Requirements - Control (commonly missing needs in bold)

Part identification

Release numbering

Secure centralized vault

Check-in/out

Manage engineering change process

Manage mechanical CAD designs

Support multi-CAD

Support multi-CAD assemblies

Document management

Metadata management

Approval processes

Manage product states

Manage release process

Manage product / embedded software

Track revision history

Manage physical representations of electronic designs

Manage electronics designs

Managed data associations



Extending the Control – Access – Share Basics

Fill in the Missing Elements

The missing elements also follow themes in the capabilities required to search and retrieve information:

• Access: The requirements that aren't common to more basic PDM systems are primarily related to search capabilities such as "where-used," which can vary dramatically between different systems, and the ability to support visual representations of products.

PDM Requirements - Access (commonly missing needs in bold)

Centralized information access

Standard parts library

Access control

Data organization and classification

Data retrieval

Publishing of viewables

Visualization and visual search techniques

Where-used

 Share: The gaps in the ability to share data also fall into some common themes, including deeper functionality to support business processes and allowing people to view products. Beyond those, there is also a big difference between the readiness for systems to allow collaboration, particularly with people outside of the company. Finally, we see some interesting technical gaps that could help support collaboration including simplifying access and making information accessible using a variety of devices.



Please reference additional detail for the requirements in these lists in the <u>PDM Buyer's Guide</u>.

PDM Requirements - Share (commonly missing needs in bold)

Access for casual users

Simplified apps for non-technical users

Easy to identify correct parts

2D and 3D visualization

Augmented reality visualization

Collaboration capabilities

Manage, share, and view CAD data

Manage review and release process

Markup

Easy 3rd party involvement

Secure 3rd party collaboration

Reporting

Multi-device, mobile-ready support



Going Beyond PDM Basics

Target Broader PDM Capabilities

The previous section highlights common gaps in core PDM capabilities. This section goes beyond these basics. Some of the capabilities that differentiate more basic systems from more comprehensive ones are the very things that help companies get more out of PDM as their processes mature.

Expand PDM Requirements for Greater Value

As companies use of PDM matures, they typically engage adjacent users or add more process / workflow capabilities to drive greater value. Some call these extensions cPDM for "collaborative" PDM. Regardless of what you call it, we've extended our PDM model to include a number of key requirements that manufacturers can use to evaluate a replacement PDM system.

Based on our experience and research, we are expanding the Control – Access – Share framework to include four new areas that are commonly addressed as next steps beyond basic CAD data management:

- Communicate & Collaborate product details
- Review & Release designs
- · Enrich & Extend product engineering data
- Manage and control Projects & Processes in association with product data

Of course, it's important to recognize that service, implementation, and special requirements are still very important considerations, as we'll discuss later.



Extended Product Data Management Buyer's Guide Framework



Extended PDM Requirements

Communicate & Collaborate

The first new requirements category is related to sharing product data more broadly. Developing products goes well beyond making key engineering decisions. Manufacturers need to work in concert with key partners including suppliers, contract manufacturers, and customers. It's important to recognize that people outside of Engineering and the enterprise are not power users and require simpler access to product details. They should be able to view 3D product information visually without having to be CAD or engineering savvy. It's important to supply them with simpler applications and provide only the specific product data they need to complete their task.

Of course, there are many other valuable uses for product visualizations including product catalogues, service documentation, and marketing deliverables. Sharing 3D visuals is simply a much more natural way to communicate product details. It's important to consider augmented and virtual reality (AR/VR) needs as well given the increased adoption and expectation for these technologies.

For more information and detailed requirements please reference our <u>Design Review Buyer's Guide</u>.

Review & Release

The next new category extends Communication and Collaboration to support a category of important review and release processes. Developing successful products requires input and validation from many different disciplines across the enterprise. Manufacturers have to be able to easily share information with others in way that they can provide meaningful feedback and document their approval that designs or products meet requirements. As with more general collaboration and communication, information must be provided so participants can interpret designs without knowing the CAD tool but still give them the ability to provide feedback in a natural way, including visual markups. Finally, the release process should allow signoff and also provide the ability to provide approved, released data to downstream departments such as Manufacturing, Purchasing, and Service.

For more information and detailed requirements please reference our <u>Design Review Buyer's Guide</u> and our <u>Buyer's</u> <u>Guide for Service Information.</u>



Design Review Capabilities Framework



Extended PDM Requirements

Enrich & Extend

The third new category of requirements is related to broadening the structure and scope of product data. There is much more to a product than simply 3D geometry. While a full PLM system might include commercial product information, a more capable PDM system will likely focus on technical product details such as GD&T. A modern PDM system should support a much richer view of products than just CAD files and basic metadata. For example, manufacturers with smart products should also look for the ability to incorporate or reference electrical and software designs, potentially incorporating ECAD and ALM in association with MCAD.

Beyond managing additional data, manufacturers should recognize that different constituents need differing views of product data. An extended PDM system should support an company-wide view that translates from a CAD-centric product structure to an enterprise BOM, and support multiple views of this information. In addition, product structures should ideally incorporate production details to create a bill of process (BOP) to keep manufacturing processes in sync with product design. For more information and detailed requirements please reference our <u>BOM Management Buyer's Guide</u> as well as the <u>Selecting a</u> <u>Smart, Connected Product Design Solution Guide</u>.

Projects & Processes

The final new category of requirements is related to managing work. Basic PDM systems manage product "states" as opposed to more rich detail about current status and upcoming activities. While state-based data management is valuable, PDM systems are much more valuable when they integrate the work required to develop the product with the product details. More capable PDM systems should extend product information with the ability to manage simple tasks and workflows and project timelines. The system should provide association between design deliverables and the tasks that create and validate them, providing product data in context to support processes, to streamline execution.



Bill of Materials Capabilities Framework



New Considerations for Service, Vendor, and Special Considerations



Extended Product Data Management Buyer's Guide Framework

Ensure Business Objectives are Met

One of the key tenants of our buyer's guides is that it takes more than features and functions to make a software implementation successful. We don't define "success" as "going live" with software, but as improving business performance. As the Buyer's Guide Framework shows, we cover service, vendor, and special considerations in addition to software requirements.

Clearly not everything in the requirements for these aspects changes when moving from a basic to a more capable PDM solution, but there are some important things to consider.

Reevaluate Service Needs

Service covers the requirements for implementation, user adoption, training, and support. When moving to a more collaborative, enterprise-wide solution it's important to consider the types of users that will be using the system and how they'll access it. While engineers are comfortable learning the nuances of a rich user interface, others will likely prefer lighter "apps" that give them the targeted information they need for a single task. This increases the requirement for the system to be tailorable, but reduces the need for training.

In addition, collaboration typically requires people outside of the enterprise to access product details and provide input. In some cases, they should access less detailed information, such as visualizations. It's also important to consider how they will access the system in the first place. This is an area where using a cloud model such as SaaS or managed services may ease implementation significantly. For more information, please see <u>Choosing the Right</u> <u>Cloud PLM Guide</u>, the many of the same considerations apply to extended PDM.



New Considerations for Service, Vendor, and Special Considerations

Vendor Partner

Because the new system will likely be in use for quite some time, it's important to make sure to get the right partner. It's important to consider their product investments, for example how they plan to support the four dimensions in which extended PDM systems are expanding (see "Four Dimensions of PDM / PLM Expansion). One of the most important requirements, however, is to ensure your vendor will support the shift to the digital enterprise.

For more detail on the requirements to support the digital transformation, please see our <u>PDM Buyer's Guide</u> or our <u>Choosing the Right Cloud PLM Guide</u>.



Four Dimensions of PDM and PLM Expansion

Special Considerations

There are some unique needs that companies face for PDM, and they expand when companies add more process support and provide further access to the enterprise and partner network.

Please refer to the special considerations in our <u>PDM</u> <u>Buyer's Guide</u>. For those in the Life Sciences Industry, you can also find important requirements that go beyond PDM in our <u>Medical Devices Manufacturers Software Selection</u> <u>Guide</u>.



Cloud Software TCO Benefits



Next Steps

Extend Basic PDM Investment to Increase Value

Companies that have outgrown their PDM system can leverage their existing investment in organizing CAD files and adopt a new system to take advantage of more mature capabilities. Our research shows the value of the transition. Top Performing companies are more likely to have structured, collaborative systems like a more mature PDM or a PLM system.¹

It's time to go beyond EDM or basic PDM systems to help unlock innovation and improve product development efficiency. The requirements set forth in this guide can help frame the software selection and decision-making process to find the right system. Companies should start by focusing on the highlighted areas in the Control - Access – Share sections. This is where less capable, "generalist" file management solutions fall short because they lack an intimate understanding of processes for product innovation, product development, engineering, and support. Companies should also consider the requirements in the four new areas discussed in this guide.

Create the Foundation for Further Growth

As companies adopt a more advanced PDM system, it's important to give themselves room to expand to more mature capabilities over time. For many companies, that involves adopting advanced PDM capabilities as part of a more comprehensive PLM system to address additional aspects of products, process, departments, and product lifecycles. These are the key areas that expand PDM to PLM, and areas that PLM vendors continue to expand their solution scope.

Consider a Platform for the Greatest Potential Value

One good option manufacturers should consider to meet extended PDM needs is adopting a Product Innovation Platform (PIP). A PIP offers manufacturers the ability to expand PDM today and create room to grow as they are ready to adopt more, or more mature, processes. A PIP with a modular approach will allow them to scale and add capabilities as they need them.

Some common areas that manufacturers extend include:

- Requirements Management
- Quality Management
- Product Costing
- Product Compliance and Sustainability
- Manufacturing / Bill of Process
- Service Lifecycle Management
- Systems Engineering
- Program Management

These are the capabilities that a current Product Innovation Platform should provide. Finally, no company should select a solution without considering the cloud or digital transformation. To ignore the realities of these two trends would be shortsighted.





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About the Author

Jim Brown is the President of Tech-Clarity, an independent research and consulting firm that specializes in analyzing the business value of software technology and services. Jim has over 20 years of experience in software for the manufacturing industries. He has a broad background including roles in industry, management consulting, the software industry, and research.

Jim's experience spans enterprise applications including PLM, ERP, quality management, service lifecycle management, manufacturing, supply chain management, and more. Jim is passionate about improving product innovation, product development, and engineering performance through digitalization and the intelligent use of software technology.

Jim is an experienced researcher, author, and public speaker and enjoys the opportunity to speak at conferences or anywhere he can engage with people with a passion to improve business performance through software technology.

References

¹ <u>Best Practices in Managing Design Data</u> – Tech-Clarity ² Design Data Management Maturity Improves Profitability - Tech-Clarity

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