Tech-Clarity

Tech-Clarity Insight:

The Business Value of Product Data Management

Achieving Rapid and Extendable Benefits with Preconfigured PDM

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Executive Overview

Manufacturers today face challenging markets and an uncertain global economy. To survive they are trying to improve the speed of product development despite reduced headcount and budgets. One positive note is that many manufacturers are gaining significant value by implementing product data management (PDM) solutions. Tech-Clarity interviewed several small to midsize manufacturers (Table 1) to understand their experiences. Each of these companies implemented PDM for different business reasons, although several common themes were repeated. These themes are consistent with previous research on the topic, and include:

- Control and secure product-related data
- Improve the ability to quickly find and reuse information
- Share product knowledge and collaborate with other departments

Manufacturers turn to PDM to take control of their product information and get more value from it. These solutions help companies manage their data and processes and make them accessible to their Engineering peers and downstream departments. As a result, PDM helps companies achieve business benefits including increased efficiency, improved quality, reduced cost, and the ability to bring products to market much faster. PDM also serves as a foundation to support more advanced capabilities including advanced configuration management, multi-CAD support, and a broader product lifecycle management (PLM) implementation offering even greater business value.

Company	Description
Veeraja Industries	Total solutions provider of coolant filtration, chip removal and coolant management
Flovel Energy	Fully integrated hydro power equipment supplier
Weir Valves & Controls	End-to-end whole plant solutions to nuclear, fossil-fired and renewable power stations

Table 1: Companies Interviewed

Discussions with these manufacturers reveal a lot about their PDM implementations. For example, implementing the software without significant modifications helps companies achieve benefits more rapidly. Companies can accomplish this by using preconfigured, or "out of the box" PDM solutions. These solutions offer predefined settings and data such as roles, reports, attributes, and forms to allow manufacturers to get up to speed quickly. They also provide best practices embedded in predefined workflows so manufacturers don't have to invent processes from scratch where they currently have manual or outdated processes. This preconfigured approach allows companies to get up to speed quickly and expand their capabilities over time to gain further benefits.

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The Business Value of PDM – Controlling Product Data

Why do companies adopt PDM? The business value comes from several sources. The first source identified from the interviews was control. Manufacturers rely on good product data to develop and produce quality products. To do this, they need to control their product data. "*Our primary objective was to sort out the data, to get it in line*," explained Mr. Pinakin Mate. Mr. Mate is the CEO of Veeraja Industries Private, Limited, a total solutions provider of coolant filtration, chip removal and coolant management. "*Earlier the engineers used to have free ground, but now the process is streamlined and locked down so they can't just store data anywhere and name it anything*," he explains.

We were not able to control or standardize our engineering information without the common database provided by PDM.
Mr. Arun Gupta, Head of Design Engineering for Turbines, Flovel

Part of the challenge in controlling information is managing revisions and complex configurations. Manufacturers need to know which version of their data is the most recent and understand what has been released to manufacturing. That's a big challenge with dispersed data, files kept on local storage, or information on shared network drives. "*We were not able to control or standardize our engineering information without the common database provided by PDM*," says Mr. Arun Gupta, Head of Design Engineering for Turbines at Flovel Energy Private Limited, India. Without controls, manufacturers are prone to errors by producing or purchasing against the wrong version of a part. Jonathan Mills, Engineering Manager, Weir Valves & Controls UK Ltd., describes a similar situation. "*No controls were in place for the release and revision of 3D data*," Mr. Mills says. "*Bills of material were out of sync with ERP data*."

Product designs represent significant investment in intellectual property, and can become a competitive issue if the information is compromised.

Another aspect of controlling data is managing information security. Product design data represents a significant investment in intellectual property and can cause a competitive crisis if the information is compromised. "*We had a lot of human turnover*," Veeraja's Mate recalls, "*People came and went, which made data security a concern. That was our second highest priority for PDM*." PDM systems provide role-based security to selectively share product information with the right people. "*Without PDM we had no control over our information and different engineers had their own data*," describes Flovel's Mr. Gupta. "*Now with PDM we have access and security*." Control helps engineers manage their data in a protected, secure environment, keeping their designs safe yet easy to access.

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The Business Value of PDM – Making Product Data Accessible

Another common theme identified by the participants was the ability to quickly retrieve product data. Of course it first needs to be controlled before it is shared. Making inaccurate information more broadly available would be counterproductive. One of the most important reasons to improve data accessibility is engineering efficiency. In an uncontrolled environment, engineers spend too much time looking for information or recreating design data. PDM helps alleviate that problem. "*We want to make information available to everyone, including technical catalogues, standard technical information, and quality standards*," says Mr. Gupta of Flovel. "*Searching this information is very quick with PDM*." Decreasing the amount of time engineers search for information allows them to focus on innovation and adding value instead of wasting time searching for files or "recreating the wheel." This in turn shortens cycle times, improves time to market, and saves money through increased efficiency.

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Long search times may also cause engineers to reinvent the wheel. If information isn't easy to find, it will not be reused. Reuse improves both efficiency and design quality because engineers aren't starting from scratch each time. "*All of our products are custom, and we realized we were reinventing the wheel with each one*," Mr. Mate of Veeraja recounts. "*The designer would start rethinking from the concept stage, draw it, and then face the same problems that we might have solved five years back. We had to go through the whole process again and again, that was the frustrating part*." PDM, on the other hand, provides multiple search tools that can help engineers find what they need. Otherwise, as Mr. Gupta of Flovel cautions, "*Without PDM, Engineering can't find information and the next engineer might be repeating the same job*."

All of our products are custom, and we realized we were reinventing the wheel with each one.
Mr. Pinakin Mate, CEO, Veeraja Industries

The Business Value of PDM – Sharing Product Data

Making design data available within Engineering is important, but PDM also helps make the right information available across the business. One of the main benefits described by research participants was the ability to easily share product data with downstream functions that need accurate, timely data to do their jobs. Purchasing, Manufacturing, and others depend on the data from Engineering to play their role in developing and delivering profitable products. "*We had to have strong systems so that we could quickly*

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design products and make accurate data available to Manufacturing," explains Mr. Gupta of Flovel, "*We needed to make information correct and get the data to all departments*."

PDM helps manufacturers get accurate information – in the right context – to those that rely on it to do their jobs.

PDM helps manufacturers get accurate information – in the right context – to those that rely on it to do their jobs and makes sure that they have the right versions all the time. For those in the business who do not have direct access to a CAD workstation, PDM solutions can share visual representations from multiple CAD systems through lightweight viewing technology. This helps engineers by allowing them to easily share information with suppliers and other departments. With information accessible in a secure location, engineers can focus on designing products instead of answering questions or printing screenshots of designs for others.

Achieving Value Quickly with Preconfigured PDM

PDM provides control, ease of access to information, and product data sharing outside of Engineering. But not all companies have the IT and business resources to implement such a solution. Smaller companies, in particular, require ease and speed of implementation and may not have an IT staff to support a significant installation effort. As Veeraja's Mr. Mate explains, "*A lot of companies in India don't have a dedicated IT team*." For these companies, it is critical to find a PDM system that includes implementation wizards and an architecture that is easy to maintain.

From a business perspective, the departments that will be using the system are also likely to be running lean and need to implement the solution rapidly and as efficiently as possible. These companies should look for solutions that provide best practices in the form of preconfigured data and workflows. All three of the companies participating in the research for this report implemented a preconfigured PDM solution that follows these best practices. "*Fifty percent of the workflows were directly applicable from the start, the other half we only had to modify a bit*," recalls Mr. Mate of Veeraja.

Our solution is not customized very much because it is a tool that can be used out of the box.
Mr. Arun Gupta, Head of Design Engineering for Turbines, Flovel

By taking advantage of packaged roles, groups, access rights, and other attributes companies can reduce the time it takes to implement from scratch. In this way, they reuse best practices and can make minor adjustments as required to support the uniqueness of

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their business. "*Our solution is not customized very much because it is a tool that can be used out of the box*," explains Flovel's Mr. Gupta. "*The tool is very good, it is a very standard product that addresses the needs of the engineering market*."

Getting Started

Clearly, it is important to select a solution that provides the right functionality and technical environment (Table 2) to achieve the desired business value. Reducing modification to the PDM environment helps companies achieve benefits earlier. For those that do need to make some changes, the good news is that most of the changes to PDM systems can be made through configuration as opposed to modifying software code. "*Our PDM is as close to out of the box as it can be, we configured about ten percent of it to meet part numbering, attribute mapping, and naming conventions that were already in place in our company and used in our other systems,*" says Weir Valves' Mills.

Value	What to Look For in PDM
Improved Time to Market	Data Control Best Practice Workflows Effective Search
Quality, Reduced Errors	Ability to Share Data Collaboration Tools Data Control Multi-CAD Data Management
Efficiency	Effective Search Best Practice Workflows
Reuse	Data Control Effective Search
IP Protection	Data Control Access Rights
Time to Benefit	Out of the Box Functionality Preconfigured Roles Standard, Best Practice Workflows Preconfigured Settings
Ease of Upgrade	Out of the Box Functionality Growth Path to PLM

Table 2: What to Look for when Selecting PDM

The research also found that help is available for companies adopting PDM. There is no need for a manufacturer to do it on their own, particularly when this may be the first such system they have implemented. The companies participating in this study each got help from experts and local resources such as value-added resellers (VARs) and their software

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vendor. "*We invested in a 'value discovery audit' to help understand processes*," says Mr. Mills of Weir Valves. Mr. Gupta of Flovel told a similar story, "*An expert audited our process and saw some advantages in doing things differently*," he explained, "*As an example, we implemented thin clients at the distant manufacturing plants so they can easily see technical information*." The assistance may be technical and functional, and can even point out new business ideas. "*Before buying PDM we only wanted to take care of design, that was our only aim*," explains Mr. Mate of Veeraja, "*But we worked with a VAR and they opened us up to other improvement opportunities*."

Taking Advantage of (and Extending) the Benefits

The companies researched for this paper are gaining significant business benefits from PDM. These benefits include increased efficiency and speed. "*We can get the correct and latest information by searching for ten seconds instead of ½ hour conventionally*," explains Flovel's Gupta. In fact, data from Tech-Clarity Perspective: Best Practices for Managing Design Data indicates that World Class manufacturers are more likely to use structured, collaborative design data management technology such as PDM. In turn, they "*are more able to find the data they need, share it with others, manage their design projects, and provide the correct data to manufacturing*." Perhaps more importantly, they are more efficient, for example they "*spend 25% less time on nonproductive data management tasks*."

Improved efficiency boosts productivity, helps manufacturers provide faster quotes, enables faster delivery to customers, reduces cycle times, and cuts time to market. These PDM benefits are strategic to competition. "*We are able to quote the customers faster, and submit drawings to production people faster*," says Mr. Mate of Veeraja. Manufacturers can also leverage capabilities such as multi-CAD data management and advanced configuration management in PDM as business needs demand.

We can get the correct and latest information by searching for ten seconds instead of ½ hour.
Mr. Arun Gupta, Head of Design Engineering for Turbines, Flovel

Efficiency directly impacts cost, getting the most out of lean resources. "*We have not increased manpower, not increased shop floor area, and not increased design staff – but production went up 40%,*" Veeraja's Mate explains. "*Our annual turnover (revenue) has grown without additional headcount. That means we are saving money*." Manufacturers can also save money by providing the right information to downstream departments because reducing errors saves time and money. "*We have fewer design errors introduced to manufacturing*," says Mr. Gupta of Flovel, "*The problem is gone and we have reduced cost*." Veeraja also experienced fewer manufacturing issues with PDM. "*Our errors came down drastically*," remarked Mr. Mate.

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Mr. Pinakin Mate, CEO, Veeraja Industries

These results impact both the top line and the bottom line, and are achievable in a short period of time. By taking advantage of implementation tools such as wizards and preconfigured data, manufacturers can spend less time implementing and more time reaping the benefits of PDM. PDM also serves as the foundation for a broader PLM solution that offers significant opportunities to improve product development performance, innovation, and deliver higher strategic value (Figure 3). These benefits can be expanded over time by including more processes, integrating to ERP, incorporating more people, and leveraging additional functionality as needed.

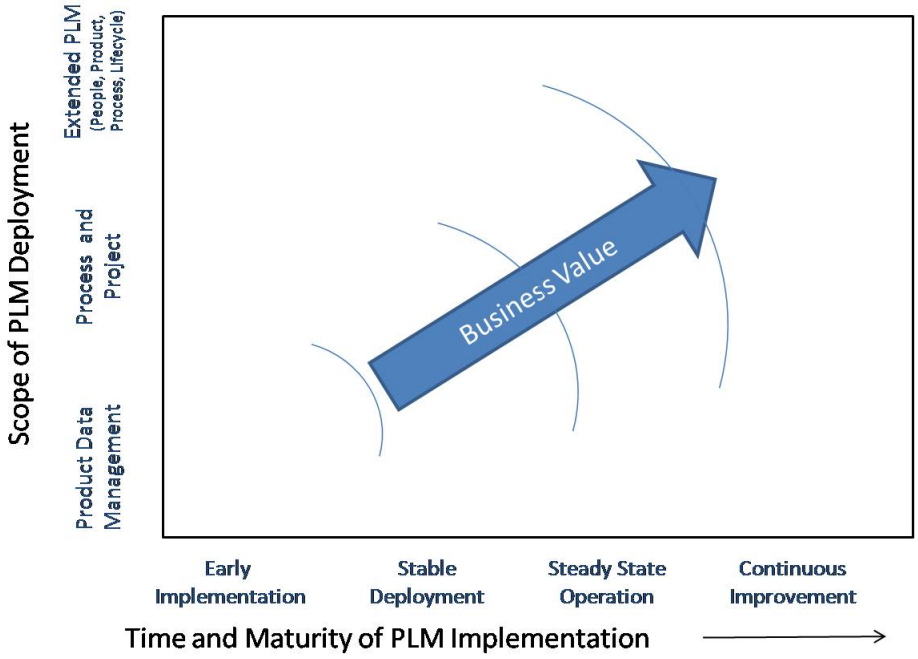

Figure 3: Expanding PDM's Value with PLM

PDM also serves as the foundation for a broader PLM solution that offers significant opportunities to improve product development performance, innovation, and deliver higher strategic value.

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Conclusion

The companies interviewed for this report use PDM to improve their ability to control, find, reuse, and share product-related information. The driver for many companies to implement PDM is to gain control over their information. As Mr. Mate of Veeraja explains, "*PDM helps get control of versions and revisions, it is very important. Otherwise it is just a file management system*." This control, coupled with search capabilities found in the solutions, provides an enhanced ability to get the right information when it is needed. "*We have made a drastic change in the time needed to find information*," confirms Mr. Gupta of Flovel. PDM also helps companies better communicate and share information within Engineering and with downstream departments that rely on engineering data to serve customers.

Expanding PDM's foundation of control, access, and sharing capabilities to a broader PLM implementation can extend business benefits significantly.

These improvements, in turn, help drive efficiency, reduce cost, and improve time to market. They also help to streamline processes across the business by sharing information with downstream departments. "*The best compliment we got on our PDM systems was by our commissioning engineer, who said that the software tools (including 3D CAD) resulted in the first time he could assemble our system without doing modification on site*," shared Mr. Mate of Veeraja. Mr. Mills of Weir Valves describes similar benefits, including "*...reduction in engineering errors, efficiency, time savings through not having to search for data*." Expanding PDM's foundation of control, access, and sharing capabilities to a broader PLM implementation can extend these business benefits significantly and offers numerous opportunities to improve value.

We keep our PDM as 'vanilla' as possible to keep it simple, very little has been changed from the standard.
Jonathan Mills, Engineering Manager, Weir Valves & Controls

Perhaps most importantly, these benefits can be achieved quickly with preconfigured PDM solutions. "*The solution was relatively easy to implement, it took a few weeks to load the software, create the users, and make some initial flowcharts. It didn't take too long*," Flovel's Mr. Gupta recalls. Of course implementations can take longer without using preconfigured solutions or if significant software changes are made. "*We keep our PDM as 'vanilla' as possible to keep it simple, very little has been changed from the standard*," describes Weir Valves' Mills. In the end, PDM becomes a strategic asset to the business. "*If we didn't have our cPDM now it would be a disaster for us*," concludes Mr. Mate of Veeraja. Companies that have PDM recognize how critical controlling data,

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making information accessible, and sharing knowledge is to their business and can't imagine living without it.

Recommendations

Based on industry experience and research for this report, Tech-Clarity offers the following recommendations:

- Use PDM to secure intellectual property and control product data and processes in a central location
- Enable rapid retrieval of product information to improve efficiency and enable reuse
- Share product information and collaborate with downstream functions such as Manufacturing to improve quality and reduce costly errors
- Take advantage of PDM systems with preconfigured, best practices for security, part numbering schemes, and other common information required to set up a the system
- Leverage standard best practice workflows such as "release to manufacture" and "engineering change control" to speed implementation
- Limit customization of PDM in order to achieve rapid time to benefit and simplify future maintenance and upgrades
- Take advantage of the business benefits that PDM has to offer, including speed to market, improved efficiency, and reduced cost
- Achieve benefits quickly, and grow the value over time by including more processes, integrating to ERP, incorporating more people, and leveraging additional functionality as needed
- Look for PDM solutions that can grow to accommodate future functional and technical needs including multi-CAD data management, advanced configuration management, and performance scalability
- Grow value over time by leveraging PDM as a foundation to implement high-value PLM processes and capabilities

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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. His experience spans enterprise applications including PDM, 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 the 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.

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About the Research

Tech-Clarity interviewed three manufacturers and published the results in a 2011 paper titled Tech-Clarity Insight: The Business Value of Product Data Management – Achieving Rapid and Extendable Benefits. This paper is an updated version of the findings from that research.

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