

**Tech-Clarity**

*making the value of technology clear*

**Issue in Focus:  
Business Intelligence  
Extending PLM Value**

***PLM Maturity Enables  
New Value from Analytics***



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## Introducing the Issue

Like other enterprise applications that have come before it, Product Lifecycle Management (PLM) has reached a level of maturity where it contains a tremendous amount of valuable business information. Unfortunately, like earlier applications, the data is frequently locked away and not leveraged during early phases of adoption. Now, PLM has matured in two important aspects:

- Manufacturers have moved forward along the maturity curve with their PLM implementations.
- PLM has evolved and expanded to incorporate more valuable, business-focused data in addition to technical information

Most manufacturers that invested in PLM have accomplished the first objective of their PLM implementations – getting their product data under control. Now, they have expanded on that and are developing the “one source of truth” for product data that leading manufacturers envisioned in the late 1990’s. As PLM implementations have matured, manufacturers have leveraged the core capabilities and extended PLM to new sources of value. The scope of PLM has expanded to include more people, more parts of the product lifecycle, and more aspects of the product (Figure 1). The solution has also grown to support more business processes such as product compliance and service management. At the same time, the information included in PLM has expanded to a much richer view of the product, now frequently including commercial information in addition to technical specifications. This evolution has significantly expanded the potential value of mining this information to make better business decisions



**Figure 1: PLM Expansion and Evolution**

The perfect storm of application and implementation maturity has set the table for significant value to be unleashed from PLM. The data currently buried in PLM systems is an untapped source of value for manufacturers. Now, companies are turning to Business Intelligence (BI) in order to tap into the wealth of product knowledge generated and available in PLM repositories. And like ERP, Customer Relationship Management (CRM), and other enterprise applications have proven in the past, there is strategic and tactical business value waiting to be delivered.

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## Mining the Value from PLM Data

PLM data is an asset that has been quietly growing as companies use and expand their PLM implementations (Figure 2). Once product and process data are available, trustworthy, and well controlled they can be used to provide business insight and drive more informed decisions. Today's mature PLM implementations are ready to expand in value as product data evolves to product knowledge and then to product intelligence. Consider the following definitions:

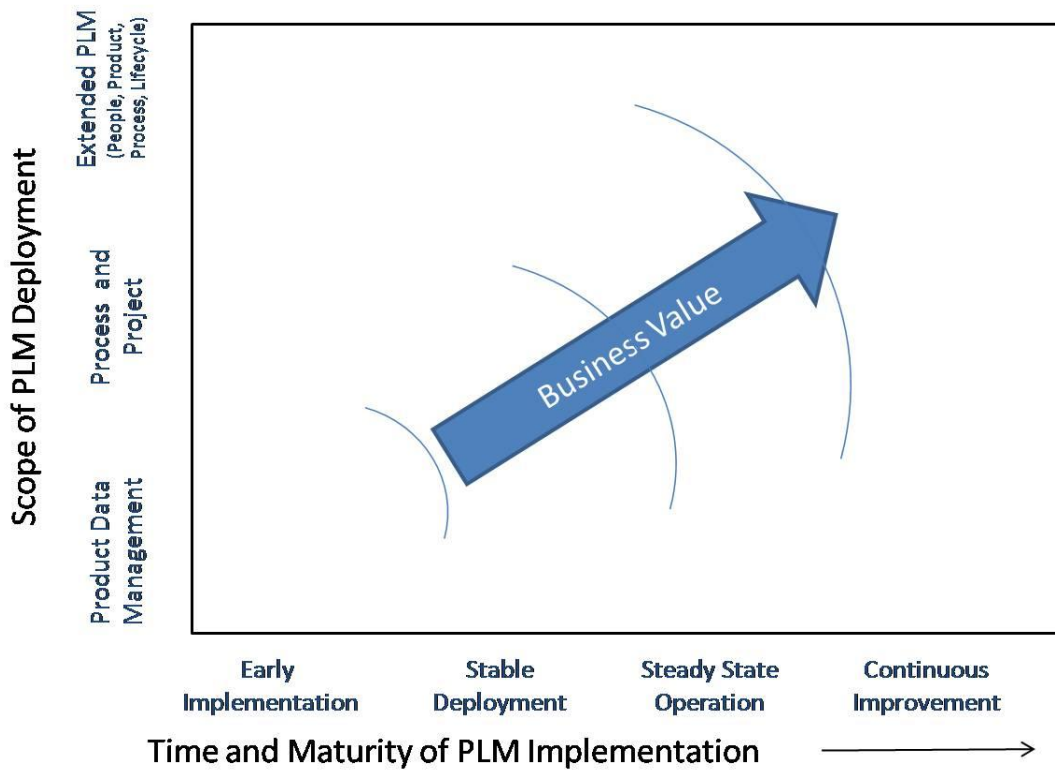
- **Data** - Information captured and under control
- **Knowledge** – Data is available for search and reuse
- **Intelligence** – Knowledge is aggregated, analyzed, and made visible to the enterprise

As companies move through this logical progression, the value they receive from their information increases exponentially. Once companies move to a product intelligence mindset, they can use their PLM information to learn and provide insight into products, projects, and product-related processes. Data aggregation can help identify trends and opportunities for improvement. Exception reports identify specific issues quickly so they can be addressed before they become bigger problems. Dashboards can help manage processes and teams. Ad-hoc analysis can provide the information required to make better strategic business decisions. At its most mature level, data can be mined to identify trends or exceptions that can be analyzed to provide new insights and prompt continuous improvement. In this way, BI can help discover strategic issues in addition to helping identify and solve everyday problems.

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**Figure 2: PLM Business Intelligence Value Map**

In PLM, data capture may be as “simple” as getting bills of material (BOMs) under control, managing CAD files, and providing a central source for clean product data like specifications. Moving to knowledge provides the opportunity to search products and components to promote reuse or help engineers leverage existing product data to avoid recreating the wheel. It can also mean providing a mechanism to search for duplicate parts or components to enable cost and quality benefits from part consolidation. Extending to product intelligence may mean status reporting that helps drive improved time to market by reporting project problems earlier, identifying missing deliverables that could delay product launch, analyzing BOMs for regulatory compliance, identifying high cost components that are similar in nature to lower cost ones, analyzing product requirements, or mining service data to find common service issues that can be addressed through continuous improvement. For example, BI can be used to analyze failures to improve current and future Failure Mode and Effects Analysis (FMEA) or perform root cause analysis. Or, analytics could be used to expose products that have a lot of change requests to investigate why that is occurring and identify improvements.

BI in PLM offers the opportunity to improve visibility into current programs and projects and better manage the impact of changes to project resources such as people, time, and money. Dashboards and reports can provide insight into people, products, processes, deliverables, and lifecycle information to improve product insight and drive higher levels of product profitability. By making information visible, manufacturers gain the ability to learn and improve their product innovation, product development, and engineering performance.

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## **Sources of Value from BI in PLM**

PLM is already providing significant value for manufacturers, and that value can be extended by introducing reporting and analytics capabilities. It isn't hard to identify opportunities to use BI to improve individual efficiency. For example, using reporting can streamline the creation of many project deliverables. Those opportunities alone may be enough to provide a solid ROI for a BI initiative. But BI can be applied in a number of areas that provide even greater returns. For example:

- Identifying problems sooner, reducing project and product rework that results in excess cost and delayed time to market.
- Closing the loop between service and engineering to improve product quality through design improvement.
- Improving product development project timeliness and the effectiveness of gate reviews.
- Identifying cost saving opportunities or sourcing issues.
- Identifying opportunities for part consolidation.
- Providing supplier dashboards to help understand and improve total performance of suppliers including cost, quality, and delivery timeliness.

Beyond these improvements, BI can also enable continuous process improvement. By analyzing the history of products, projects, and processes companies are able to identify best practices (what's working) and opportunities for improvement (what's not working). This can be accomplished through formal process metrics in a six sigma style program, or simply by providing managers with better transparency to performance. Either way, the old adage that "knowledge is power" is definitely true in PLM with BI.

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## Special Considerations for BI in PLM

Extracting new business value with BI is not new to most manufacturers. While many companies already have a BI infrastructure in place, it is important to recognize that PLM has certain important differences from other enterprise applications. Presenting effective dashboards and charts is important, but the decision of which tool to apply should be based on the most pragmatic and expedient way to unlock the value. The BI tool is only a part of what is required for a successful BI deployment. Developing an effective BI in PLM strategy also requires knowledge of the engineering and product development domains and the specific software applications being mined. The most elegant BI tools may not be the most efficient and cost-effective approach to tap into PLM data if they don't address certain specific requirements. Some criteria that should be considered when developing a BI strategy for PLM include:

- Recognition that data security is tantamount to protecting intellectual property (IP).
- The availability of standard deliverables such as those required by the government for contractors, common project reports, and portfolio views.
- The BI tool should recognize the data model without requiring additional business analysis or customization, one of the biggest challenges in a BI implementation.
- Industry-specific reports and regulations should ideally be addressed “out of the box” with the software. For example, regulations like International Traffic in Arms Regulations (ITAR) require companies to limit (and report) access to certain essential information.
- Combining PLM information with data from other sources – such as ERP – may play an important role in making better decisions.

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## Conclusion

PLM implementations have matured to a scope and state that offers significant potential value from mining the underlying data. Accessing this information can help identify exceptions, manage and improve processes, and identify strategic trends that may uncover significant insight and value. Manufacturers tapping into this knowledge can achieve value by improving individual efficiencies and enterprise performance, but should be aware of certain special considerations for PLM that must be taken into account. An integrated PLM-BI reporting and analytics approach can offer rapid time to benefit, complementing an enterprise BI strategy.

## Recommendations

- Ensure you are capturing complete, clean product data via a solid PLM implementation.
- Look for opportunities to leverage PLM data to make better business decisions.
- Identify high-priority reports and analytics that will help drive product profitability.
- Ensure compliance with IP and regulatory needs, protecting PLM's sensitive data.
- Look for standard industry deliverables and reports out of the box.
- Consider integrated solutions that pre-define data models and relationships, providing a big head start for any BI initiative.
- Leverage existing, "canned" reports as a start, but more importantly leverage the underlying data models these reports are based on to jumpstart creation of new reports or dashboards.

## About the Author

Jim Brown is the President and founder of Tech-Clarity, an independent research and consulting firm that specializes in exposing the true business value of software technology and services. Jim has over 20 years of experience in application software for the manufacturing industries, with a broad background including roles in industry, management consulting, the software industry and research spanning enterprise applications such as PLM, ERP, SCM and others.

Jim is an experienced researcher, author and public speaker and enjoys the opportunity to speak at conferences or anywhere that he can engage with people that are passionate about improving business performance through software technology.

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