Integrating Product Lifecycle Management and the Supply Chain

Abstract

Today, companies realize the importance of involving the global supplier network early in the product development cycle. This involvement can begin as early as the conceptualization stage and continue across the design, production, distribution, and service phases—the entire product lifecycle. This implies that product lifecycle management (PLM) and supply chain management (SCM) can no longer be viewed in silos. These two functions must integrate seamlessly if companies wish to bring high quality, innovative products to the market quickly and cost effectively. Integrating product lifecycle information with supply chain processes also helps organizations hit the right notes with respect to profitability and customer satisfaction. With organizations aggressively pursuing new markets and rapidly expanding operations to drive growth, PLM's role as a supply chain enabler is likely to become more important in the future.

Uncertainty and volatility are the new normal for the global supply network. Future business growth requires drastic changes in existing systems to address increasing time-to-market and cost pressures.

Navigating the Challenges of a Global Supply Chain

Global, multi-tiered supply chains are a complex web of relationships where multiple suppliers and outsourced manufacturers play a key role in final product delivery. As business volatility, customer demands, product development costs, and competition continue to rise, companies must address these supply chain challenges to compete effectively:

- Product customization
- Market expansion
- Supply chain volatility.

Building Collaborative Partnerships

Given the increased product complexity and shorter product lifecycles, supplier integration is crucial to improving supply chain planning and agility. Globally dispersed suppliers and manufacturing partners extend an organization's capabilities by participating in early design, providing product development support, and ensuring the fulfillment of final delivery.

In the case of new product development, this integration can occur during any of the lifecycle phases—idea generation, preliminary business or technology assessment, product conceptualization, design and development, and prototype building and testing. Early, real-time, and continuous engagement with suppliers will offer the lead time necessary to plan infrastructure requirements and ramp up production, cost effectively. It also helps in timely identification of potential manufacturing problems such as cost overruns, reliability, and 'manufacturability'; issues that are usually expensive to fix at a later stage.

Cross-functional teams comprising suppliers and business functions such as purchase, engineering, compliance, quality, and manufacturing are proving to be useful in increasing productivity and reducing the risk of recalls and non-compliance. As suppliers get more aligned to the product lifecycle, it also becomes easier to monitor production in real time, such as tracking manufacturing specifications across the entire supply chain. Seamless sharing of critical information eliminates communication delays and breakdowns..

The top five areas for supply chain and PLM integration are:

- Supplier collaboration and requirements gathering
- Materials sourcing
- Compliance management
- Product cost management
- Quality control

Integrating SCM and PLM helps deliver better business outcomes:

- Reduce costs through optimized material sourcing and better procurement decisions
- Accelerate the time to market by shortening the sourcing lead time
- Reduce risks by involving supply chain partners early in the design process
- Improve quality by aligning suppliers with global quality standards

Synergy of PLM and Supply Chain

Progressive businesses seek to capitalize on the interrelationship between supply chain management and PLM to drive innovation, accelerate growth, manage costs, and improve pricing:

- **Bridge the communication gap through supplier collaboration:** PLM systems provide a comprehensive approach to gather requirements and manage interactions with globally dispersed suppliers. They capture information across manufacturing and production processes, right from design to product launch and support. Using automated workflows, PLM enables tracking and communication of critical information in real time, for better traceability and accountability across the product lifecycle. This brings greater process control and helps companies identify and address issues as they occur, minimizing disruptions to global product development processes.
- **Simplify sourcing through effective BoM management:** Organizations deal with multiple vendors from different markets, each following different naming conventions and underlying product structures. Cost-effective, flexible, and scalable BoM management therefore becomes critical to gain a holistic view of products and select the best vendor to source parts from. Capturing vendor information and detailed product structures is also essential for downstream processes such as aftersales services and material compliance. PLM systems eliminate the need for standalone spreadsheets and systems. They manage complex, multi-level product structures, while improving information accuracy through a centralized BoM.
- **Ensure compliance through material tracking and management:** As organizations move toward using more compliant materials, it places additional pressure on the supply chain. They need to meticulously document, track, manage, and report all the information associated with a product and its constituents. With in-built BoM and configuration management capabilities, PLM systems can manage the entire lifecycle of materials from design to production. Digital templates help streamline and standardize material information gathered from the global supplier base. Suppliers can therefore be easily classified as compliant and non-compliant.

- **Improve profitability with better product costing:** Shorter product lifecycles give manufacturers a narrow window of opportunity to not only get product design right, but also ensure alignment with target costs and profit margins. By linking costs with product BoMs in PLM systems, manufacturers can conduct extensive cost analyses to optimize sourcing. They can also incorporate key supply chain considerations in the design stage and model product costing across multiple variables including time, volume, shipping locations, and currencies. Such an approach helps identify areas for process and cost optimization, rationalize procurement, negotiate better with suppliers, and assess cost saving opportunities.
- **Gain competitive advantage by conforming to global quality standards:** Balancing costs and time to market with stringent quality parameters is crucial to increasing profitability in a highly competitive market. Centralized product and supplier information that can be accessed in real time facilitates the exchange of accurate design information and feedback with suppliers. This eliminates issues such as rework, redesign, and assembly delays.

The Expanding Role of PLM in Supply Chain Integration

It is evident that the supply chain and PLM are a natural fit, but there are still some gaps that need to be addressed to make the most of this integration. Some capabilities that are likely to make PLM systems more accessible and aligned to the needs of the supply chain:

- Integrating supplier's PLM systems with those of the OEM to exchange lifecycle information to improve real-time visibility into the status of a component.
- Including analytics tools to help process enormous amounts of transactional and supplier interaction information.
- Scalable licensing models such as Web-based systems, cloud, as well as innovative license sharing models to enable true collaboration with the vast supplier base spread across the globe, while reducing costs.
- Flexible interfaces to simplify the process of collecting information from suppliers and importing heterogeneous data provided in multiple formats.
- Digital simulation of global operations to help diagnose production bottlenecks and identify potential supply chain problems.

Conclusion

By supporting supply chain processes, PLM systems can successfully move beyond their traditional role of providing product development support, and help establish a framework for enterprise-wide optimization of the entire product realization process. At the same time, the supply chain can strengthen its contribution across the product lifecycle by providing early visibility to supplier product data.

For greater long term success, businesses must ensure that the integration of SCM and PLM goes beyond merely sharing of data. It should be based on the resolution of common business challenges and achievement of a shared vision—one that brings high quality products into the market quickly, and at reduced costs.

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