Create consistency and integration, win in the market

Product engineering and life cycle management

Efficiently manage the life cycle of your products

If you want to enter the market rapidly, with lower costs and with maximized profitability, then outstanding product life cycle management (PLM) is a must.

To maintain their competitive edge, manufacturing companies have to meet ever more demanding and ever more specific customer requirements - and all this while operating highly efficiently and cost-effectively. Companies therefore primarily aim to:

- Reduce development times in order to bring new products to market faster
- Cut product design, manufacturing and service costs
- Extend the actively managed life cycle of products
- Achieve maximum profitability in product business and service

Yellow line: Product life cycle with winning products
Grey line: common product life cycle

PLM with winning products (Fig. 1)
In addition to the increased customer demand for product customization, product engineering and life cycle management is influenced by other factors such as:

- Growth strategies for launch of new products and expansion into new markets
- Greater marketplace competition
- Ongoing globalization
- Increasing market volatility
- Internet of Things/Industrie 4.0

Integrated product engineering and life cycle management enables you to master complex product development and innovation processes. It can cut time to market by 30 to 50 percent and shorten the development cycle significantly. It can reduce costs for development, design and manufacturing. In addition, it can increase productivity by as much as 50 percent. Error rates during production can also be cut by up to 50 percent. What’s more, innovative products can considerably extend the life cycle, and hence total profitability.

To achieve this, companies must integrate product development across the entire value chain. PLM systems then become the central hub for product data management in operational process chains.

EY’s advisory services are uniquely suited to help you integrate product engineering and life cycle management at your company (Fig. 2):

- **PLM strategy** - Comprehensive strategy for design, engineering and simulation processes, as well as for organization, analysis and IT enablers
- **Product architecture** - Systematic optimization of product structures and modular toolkits across all corporate functions, including sales, production, logistics, procurement and marketing
- **Object-oriented mechatronics** - Integrated view of mechanical parts, electronics and software as “mechatronic objects” geared to accelerate development and test processes
- **PLM design** - Integrated engineering process design including optimization of organizational structures, roles and responsibilities, PLM analytics (e.g., KPIs and metrics), and integrated IT systems architecture (e.g., CAD, PLM, ERP)
- **PLM transformation** - Effective change management process for employee mobilization, communication and coaching to achieve excellence in process, product and data management using standard IT systems (e.g., SAP).

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**PLM SCAN** is a systematic approach used for determining the value potential of total system integration and for defining scope of preparation necessary for PLM implementation.

At many companies, product development and innovation processes are not integrated into the supply chain causing problems in downstream assembly. Often multiple developers work separately on the same project focused on different goals without important feedback from customers, sales and service in a structured form. Many companies lack seamlessly integrated processes and information flows across all levels of the value chain. Our PLM SCAN covers the entire product life cycle - from planning and design, through to service and support.

**Gap Analysis: Identification of specific areas for action**

As a first step, we conduct focused interviews to determine your individual strengths and weaknesses in product engineering and life cycle management. We compare your PLM performance with that of selected competitors and benchmark against their success factors.

We work hand in hand with you to identify the characteristics that can be leveraged to increase your competitive advantage by leveraging leading practice PLM performance. We perform a detailed actual/target comparison and pinpoint the drivers of complexity versus leading practitioners. On the basis of the PLM mechanisms within your company, we create a “readiness” model for the key characteristics. In workshops, held jointly with your development, manufacturing and assembly, and sales and service units, we identify specific areas for action.

**Creating a to-be model: Setting out a specific PLM strategy and defining measures**

We work in close collaboration with your senior management to set out your PLM vision and strategy. This forms the foundation for subsequent work. On the basis of the strategy and gap analysis, we develop detailed measures designed to meet your goals. These goals can include reducing time to market and making development more efficient. Our catalog of measures specifies what we recommend you to change in the areas of organization, processes, performance management and IT systems.

IT solutions play a pivotal role in optimizing product engineering and life cycle management; we therefore create a corresponding concept for your PLM IT architecture. In this context, we take into account the interfaces required to integrate PLM into your current IT landscape. Consistency across all systems and the entire product life cycle is essential for your competitiveness.

**Transformation planning: The roadmap to PLM excellence and business case analysis**

The roadmap shows you which measures have to be taken and when (Fig. 3). Importantly, you can see the interdependencies between the individual measures. All the measures identified can be prioritized according to their expected added-value. For those with the greatest value add, we develop and validate efficient management processes and KPIs together with your team. At the end of this phase, you receive a business case for implementing your PLM strategy and a timetable for putting it into operations.

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**The roadmap to PLM excellence shows which measures should be implemented and when (Fig. 3)**

<table>
<thead>
<tr>
<th>Short-term</th>
<th>Medium-term</th>
<th>Long-term</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concept for enterprise-wide PLM board</td>
<td>Global PLM</td>
<td>Enterprise-wide PLM excellence</td>
</tr>
<tr>
<td>Defined roles and access rights</td>
<td>Establish enterprise-wide PLM board</td>
<td>Process training</td>
</tr>
<tr>
<td>Enterprise-wide communication processes</td>
<td>Enterprise-wide responsibility for PLM</td>
<td>Collaborative development</td>
</tr>
<tr>
<td>Reuse of interchangeable parts</td>
<td>Implementation of MRO processes</td>
<td>Implementation of integrated PLM systems</td>
</tr>
<tr>
<td>Global master data concept</td>
<td>Introduction of integrated PLM processes</td>
<td>Implementation of a PLM balanced scorecard</td>
</tr>
<tr>
<td>Information processes for updates</td>
<td>Condition Monitoring</td>
<td>Controlling as an active control system</td>
</tr>
<tr>
<td>(Re)versioning of data and documents</td>
<td>Central data platform</td>
<td>Customer-oriented KPIs</td>
</tr>
<tr>
<td>PLM training</td>
<td>Variant management</td>
<td>Introduction of enterprise-wide controlling</td>
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<td></td>
<td>Dependency management</td>
<td>Incentivization according to internal KPIs</td>
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<td></td>
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<td>Enterprise-wide controlling concept</td>
</tr>
</tbody>
</table>

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**Performance management**

**IT**
Implementation: Putting the roadmap for PLM excellence into operations

Experienced EY advisors collaborate with your employees in mixed project teams to implement the agreed measures. At the same time, we help you get all stakeholders to buy in to the changes involved. During a pilot phase, we fine-tune the measures. In addition, clearly defined roles and responsibilities are established for the processes to be implemented as well as establishing the corresponding KPIs. We also help you determine the PLM systems that best suit your company. Currently, PLM IT systems can be divided into three categories:

- **CAx-related systems** feature deep CAx data integration and a small number of enterprise-wide engineering process functions.
- **ERP-related systems** integrate well with enterprise-wide project and ERP document management.
- **Integrated PLM systems** are independent of CAx and ERP systems and offer higher performance for enterprise-wide engineering processes.

At the end of this fourth step, you should be able to realize bottom line cost-savings thanks to enhanced PLM performance and enter the market earlier with superior new products and product variants increasing sales. You should have a holistic overview of all your product development projects enabling you to quickly and confidently let customers know which product modifications can be implemented at what price. Finally, you should be able to integrate new projects into your supply chain rapidly and seamlessly with loss of operational efficiency.

**Thanks to integrated PLM, new developments enter the supply chain more rapidly and more cost effectively**

EY has demonstrated success in optimizing entire value chains. Our advisory services combine management consulting with IT competencies and are thus particularly effective when it comes to putting ideas into action. Our customers include Fortune 500 manufacturers who appreciate our extensive industry experience, and our end-to-end advisory approach. You, too, can benefit from this know-how.

Our PLM SCAN is performed over a period of 12 to 18 weeks. Analyze your PLM performance, quickly and efficiently – and join forces with us to initiate action. The SCAN provides you with:

- Transparency regarding the strengths and weaknesses of your current PLM performance
- Benchmarking in the relevant market
- A PLM strategy and action plan
- Integrated PLM process and IT landscape
- PLM roadmap and business case for implementation

### Integrated product engineering and life cycle management with EY (Fig. 4)

<table>
<thead>
<tr>
<th>Analysis</th>
<th>To-be model</th>
<th>Transformation planning</th>
<th>Detailing and implementation</th>
</tr>
</thead>
</table>
| - Project kick-off  
- Focus interviews  
- Review existing documents and projects  
- Quantitative data analysis  
- Analysis of PLM strategy, processes and IT landscape  
- Review of PLM performance criteria  
- PLM SWOT analysis  
- Scoping workshop | - Structuring PLM use cases  
- Vision workshop ("True north")  
- Gap analysis  
- High-level concept for to-be processes  
- High level IT architecture  
- Process performance management concept  
- Change management concept  
- Prioritization workshop | - Structuring all measures  
- Description of necessary transformation steps  
- Timelines, set up transformation roadmap  
- Definition of project portfolio incl. budget, expenses, times and dependencies (business case)  
- Plan management of change measures | - Detailed business process redesign  
- Requirements/functional specification for the implementation  
- Create implementation plan and project organization  
- Implementation of new processes and IT systems  
- Establishment of new performance management  
- Change management activities, training, communication |

- PLM structure  
- Identified strengths, weaknesses, opportunities and challenges  
- Prioritized list with areas for action  
- Quick wins | - Model PLM mechanics and PLM vision  
- Documented to-be model  
- Responsibilities, performance and change management concept | - Decision document for transformation phase  
- Business case analysis  
- Transformation roadmap  
- Change management plan | - Optimized processes  
- Optimized IT  
- Performance mgmt  
- Widespread acceptance and level of expertise |

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