White Paper

Integrating Windchill and SAP

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BoostPLM
Bridge Engineering & Operations

Executive Summary

Integrating Windchill and SAP helps Bridging Engineering and Operations and accelerate New Product Introduction.
Integration gives direct cost savings due to increased productivity. Add to this the indirect savings from reduced time-to-market and better time for qualifying suppliers and you have a really good business case.

The benefits are greatly depending on how the solution supports and adapts to the New Product Introduction process and many technical interfaces simply are expensive and require a perfect but unrealistic process and data quality.
This paper pinpoints some of the most important properties that must be considered.

Why integrate?

Integrating Windchill and SAP fundamentally removes the non-value adding work of entering master data into SAP that you have already in Windchill. In medium to large companies with a large flow of master data this task can easily take up multiple FTE's and cover the business case for an interface.

The full potential in integration is not so much about automating a manual process, but about Bridging Engineering with Operations. Fundamentally this imply three benefits:

- Reduce Time-to-market
- Better quality "for free"
- Reduce cost

Reduce
time-to-market

Time-to-market is increasingly becoming important in most business areas. With the globalization comes an increasing call to avoid the commoditization of the company's goods by innovative differentiation. In many companies this involves bringing new products quicker to the market than the competitors.
McKinsey has in a study shown that 6 months late entrance to market can lead to 33% reduction in profits and other studies have shown similar effects.
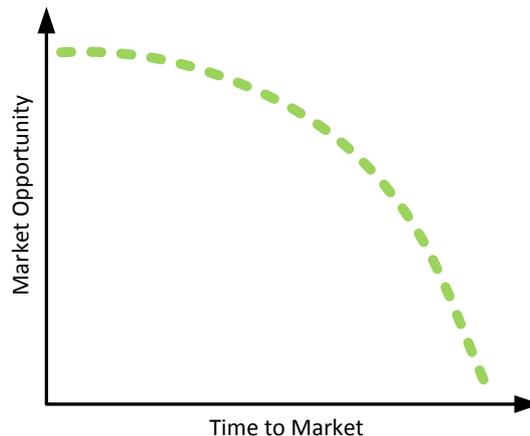

Figure 1. Market Opportunity versus Time to Market[1]

Better quality

Better Quality does not come by itself but is the result of continuous feedback. This feedback comes from the entire value chain and results in multiple iterations. The key is to have as few and short iterations as possible by involving the value chain from the very early beginning.
Manual typing of Bill of Materials into the ERP system is in itself a root cause to errors. We have experienced automating this task directly reduced errors in the Engineering Change Order process by 79%.

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[1] Tovstiga, G: Strategy in Practice, Wiley 2010

Reduce Cost

Cost reduction is a constant target for all competing companies. Improved feedback from the manufacturing to engineering is one important source to cost reductions. Another important source is sourcing. Supplier negotiations and having multiple suppliers to source from is an effective way to reduce cost. Professional purchaser will always pay attention to the 20% main component that carry 80% of the landed cost. However, when late designs are introduced little time is available for negotiating and identifying alternative suppliers for the 80% of component that accounts for only 20% of the cost.

It is estimated that involving the sourcing department earlier may reduce the direct landed cost by about 4%, which will directly impact the bottom line of the company.

To sum up: It is sensible and good business Bridge Engineering and Operations by integrating their respective systems.

How does integration impact product introduction?

In a traditional Product Development process, engineering hands over the design including Bill of Materials (BoM) to the supply chain when the design is completed. Often this implies a manual transformation of the engineering BoM into a Manufacturing BoM involving spreadsheets, which in itself requires a sharp design freeze and handover.
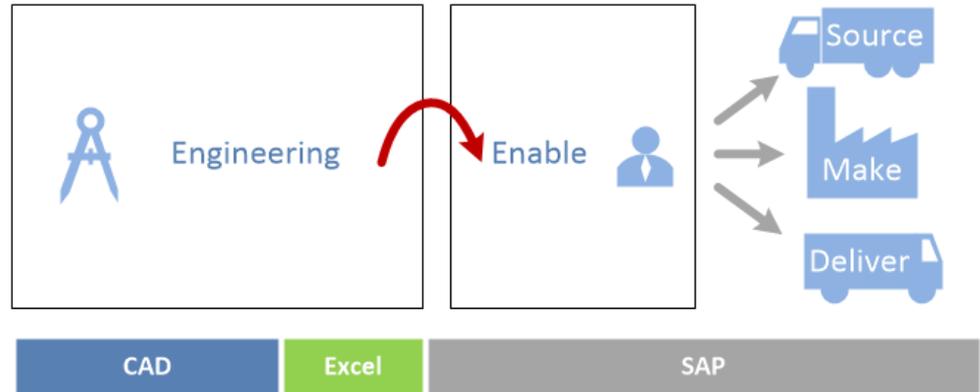

Figure 2. Sequential Product Development

This often implies high peaks in workload on Engineering before the handover and in Supply Chain after the handover.

By integrating Windchill and SAP the manual transformation is removed and BoMs are seamlessly transferred to SAP as they are appearing in Windchill. This allows the supply chain to be directly engaged much earlier with the benefits mention earlier in this white paper.
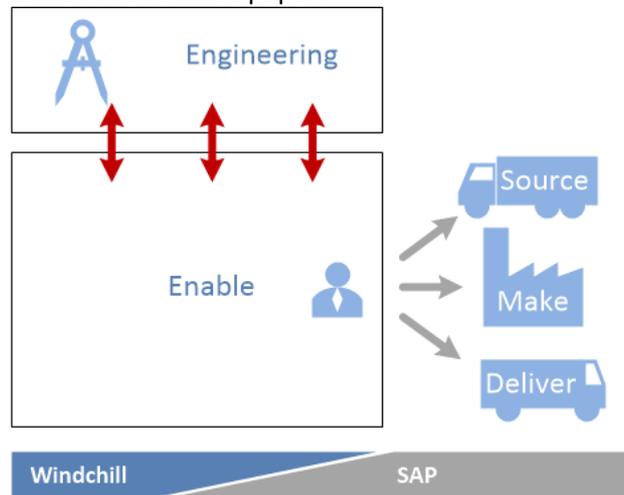

Figure 3. Concurrent LEAN Product Introduction

The workload is better balanced across Engineering and Operation.

Integration Considerations

Implementing a integration between Windchill and SAP requires thorough considerations to gain the benefits.

Scope of the integration is one of the first things to be decided. Multiple objects may be integrated across the two systems: materials, documents, BoMs, processes…

The decision depends on specific company need, and in this consideration it must be recognized that Windchill is not always the master; some information artifacts will actually flow from SAP to Windchill.

The Borderline between Windchill and SAP is another important decision. Multiple options are possible, and the best solution again depends on operation model of the company. Whether the company operates on engineer to order basis or manufacture to stock will raise different needs.
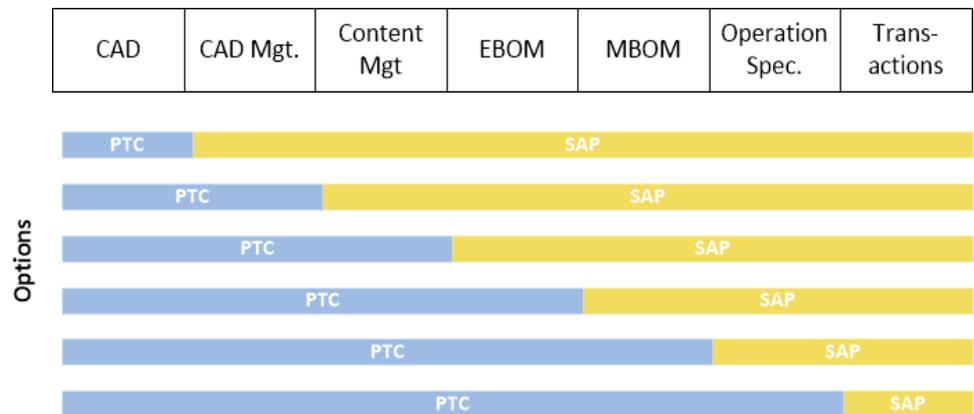
CAD	CAD Mgt.	Content Mgt	EBOM	MBOM	Operation Spec.	Trans-actions

Figure 4. Multiple options for placing the borderline.

The decision should focus on the different strengths of Windchill and SAP. One consideration is to ensure that the borderline is simple to understand and robust. On the other hand it worth to consider if the engineering BoM adds any value in the ERP system. Reusing CAD-models in the work instructions is yet another consideration that may impact the decision.

Engineering Change Management is often perceived to be a bureaucratic inefficient process.

Even some major companies do not support this process directly in their Windchill and SAP systems. However, especially the Change Order or Change Notice part is very important to include in Windchill and in SAP if the integration of these systems are to be robust.

The ECO process has several benefits; first of all it provides a standardized way to collect, process and distribute information internally and externally. The ECO in the systems can be perceived as an envelope containing all information about the change of artifact like materials, documents, BoM and processes.

Supported by workflows, the ECO may even cater planning, execution and monitoring of a timely introduction across the entire business.

Synchronizing BoMs across Windchill and SAP is not common method in integrations. Most integration simply sends the BoM from Windchill and SAP and then expects the everything is fine. However, synchronization the BoMs has some advantages:

- First of all it is safer; even if Windchill receives no error from SAP, it cannot be ensured that then content of the two systems are identical. Synchronization validates that the content is aligned after the transfer of information and any inconsistencies are flagged immediately to the responsible engineer.
- During implementing the integration the synchronization method allows that BoM ownership can be gradually migrated from SAP to Windchill during daily work. This prevents the risk and high costs of a "big-bang" migration.
- Last but not least, the synchronization allows that the BoM in SAP is updated (almost) real-time as it is changed in Windchill. The maturity of the BoM is clearly marked; e.g. new immature BoM lines may simply start as text lines in SAP, warning the Supply chain that new materials are to be expected. Later these lines will then be substituted by mature approved materials.

Clear marking of maturity status is a prerequisite for any integration. Whether we integrate materials, documents, BoMs or other object they must all have a maturity status. The status should not be used to appoint tasks as it entails that the process can only be sequential and introduce additional lead time. Instead use workflows that may be concurrent if appropriate.

About BoostPLM

BoostPLM is solely focused on Product-Lifecycle Management and Master Data across the entire value chain – from engineering, across suppliers, procurement, manufacturing, service and after-market.
Our mission is to improve our client's competitive edge by improving the processes, systems and behavior controlling the master data.

About the Author

Erik Løber has had several roles in his more than 12 years at Vestas Wind Systems A/S. He is the father of Vestas' Product Development Model "Vestas Way to Market", which is based on principles from Design for Six Sigma, Lean Product Development and System Engineering.
His recent role at Vestas has been Senior PLM and Supply Chain IT Architect. During a difficult time he took Vestas through a remarkable transition from fragmented systems and processes towards integrated IT systems and processes based on Windchill, SAP and other systems.
His focus is on processes, data and how to provide IT that support the needs across the business, in Engineering and Supply Chain. Erik is as comfortable with innovation and New Product Introduction process improvements as he is with the more technical sides of IT.

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