Costing Across Global Value Chains: SAP Product Lifecycle Costing

CIMdata Commentary

Key takeaways:

- *Global value chains are a fact of life in most industries today, and developing accurate cost estimates across global value chains often requires melding incompatible spreadsheets and costing processes.*
- *Working with leading customers, SAP developed the SAP Product Lifecycle Costing solution to provide globally available, managed capabilities to help address these issues.*
- *Their early successes in discrete industries are promising, and recent wins are from new industries such as consumer products, food, and fashion.*

Global markets almost always demand globally sourced solutions today. This is a huge change from previous experience, one that causes struggles for many companies. Historically companies were more vertically integrated, designing and manufacturing products using significant in-house content. As a result, firms possessed a great deal of manufacturing and manufacturability knowledge. They knew how much parts and assemblies cost to make, so when they did start to outsource they still had the knowledge to drive hard (and sometimes fair) bargains with their suppliers. As their portfolios expanded with variants or even new products targeted to new markets, they were forced to use suppliers that had unfamiliar processes. But still they could identify possible suppliers for a given component or assembly, get ten estimates, and pick the one with the best cost. Over time, this shifted cost knowledge to those suppliers, who could be located anywhere in the world. Building product cost models can be extremely difficult. Most costing today is done using Microsoft Excel, with value chain participants building incompatible models that must be painfully reconciled. This is getting harder and harder to do as companies lose their manufacturing experts to retirement.

Prior to the downturn in 2009, traditional supplier relationships involved a 3- to 5-year contract, where the supplier agrees to lower the initial price over the contract life. Today, companies at the top of the supply chain (i.e., OEMs) are asking, can you give me the year-four cost at the outset? That year-four cost is typically the result of supply and manufacturing learning over time at the supplier, valuable time suppliers are asked to forfeit to win the deal. Many suppliers go out of business by taking that risk without knowing their true costs or how long the downturn might last. OEMs are negotiating on what they think are facts related to price and cost, but they lack the requisite knowledge within their four walls to understand their accuracy.

Boeing provides a useful example. While they build their aircraft in few locations, this is mostly just assembly. Their global customer base demands a global supply base, sometimes literally due to government negotiations to ensure local participation in Boeing's supply chain. This makes for very complex supply chains, in some cases providing finished parts, but most often shipping parts to locations where subassemblies are created and then reshipped for final assembly. This results in a complex, multi-variate supply problem, one that can shift by customer or assembly location. As discussed above, this makes accurate costing much more difficult. Boeing needs to understand early in any aircraft program how to orchestrate these processes to manufacture and assemble efficiently. Cost is a big part of their decision-making process when considering supply chain options.

The SAP Product Lifecycle Costing Solution

To help customers address this complexity, SAP worked with their leading customers to develop a new solution, SAP Product Lifecycle Costing. Over thirty companies participated, including global OEMs, leading automotive suppliers, consumer goods companies, and industrial machinery and high-tech companies. SAP focused on helping customers develop, deploy, and manage consistent enterprise costing processes that could best leverage existing legacy and Excel information, while bringing much needed rigor, data management, and analytics to their desktops. While the solution would leverage a range of SAP offerings, openness was an important design criteria, recognizing that their customers also rely on a range of authoring, analytics, and other solutions as part of their costing process.

The resulting offering, SAP Product Lifecycle Costing, integrates with the SAP solution suite and other enterprise systems, as well as Microsoft Excel, as shown in Figure 1. This makes it easy to leverage existing document structures, bills of materials (BOMs), and associated routings from SAP´s on premise solutions to create new calculations. For example, there is an add-in framework to create direct integrations with the SAP Engineering Control Center, their standard integration solution for authoring tools like mechanical computer-aided design (MCAD) and electronic design automation (EDA) which often help generate the BOMs that must be costed. Integrations with Microsoft Excel and legacy systems can also help bring in necessary source data.

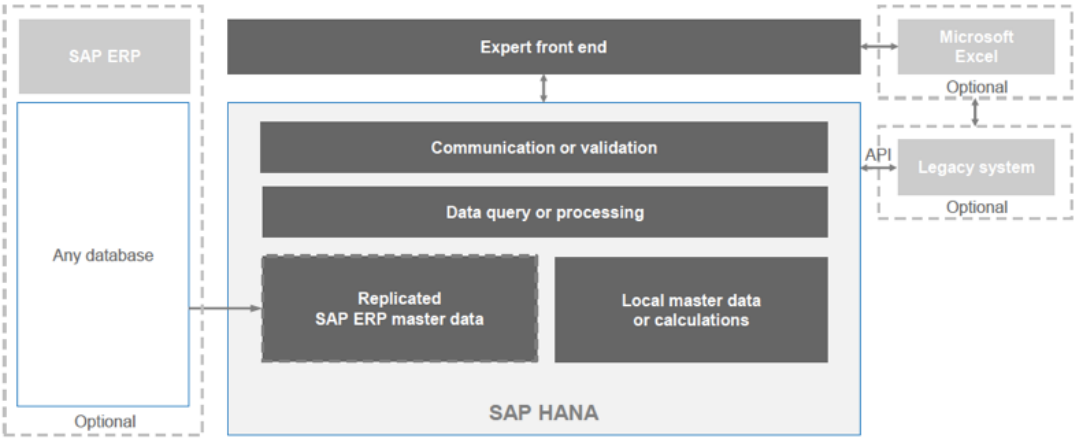

Figure 1—The SAP Product Lifecycle Costing Solution

Collectively the customer group helped SAP hone their focus on specific industries, such as automotive, industrial machinery, high tech, aerospace and defense, and consumer goods/pharmaceuticals/chemicals. It is clear this list is heavy on discrete manufacturing, a deliberate choice by SAP. With their thousands of manufacturing customers, SAP wanted to get the core right for discrete. Part of building such solutions is developing cost models for different types of manufacturing processes. Working with these lead customers SAP developed a technology database of standard processes to support costing analysis.

Some companies want to keep Microsoft Excel as part of their solution, but want to make it part of a more consistent managed processes. SAP BusinessObjects Analysis for MS Office, a part of the SAP suite can be used as a self-service analytics tool. Users can set up and run their own analyses, with their Excel live sitting on SAP HANA. They can also use SAP Lumira which is part of the SAP on-premise analytics suite that provides advanced visualization and reporting features in a similar way. All SAP analytical components run on the same database, leveraging the SAP HANA backend system, and bringing live enterprise data to the user for representation

and analysis. Management can access live insights using SAP's Cloud for Analytics solution. At the same time, SAP Product Lifecycle Costing enables customers to use their existing analytics solutions, such as Tableau.

The SAP Product Lifecycle Costing solution has a readily extensible data model. If a company needs multiple fields that are not part of standard SAP they can just add them, and they are handled like any other attribute. This is important because customers often have their own unique attribute sets for cost calculations. CIMdata agrees that data model flexibility is an important attribute for costing, given the wide variation in approaches, legacy systems, and data needs.

SAP's solution is also extendable from within the user interface. SAP provides an "add-in" framework, built on .NET and SAP extensions, that supports "side-panel add-ins and ribbon enhancements" within the application UI. This makes it easy to enhance UI ribbons, add side bars, and to support process automation. For instance, it is easy to include real-time 3D files from SAP 3D Visual Enterprise, SAP's visualization solution, which can be a huge timesaver for discrete manufacturing users. There is also an integration possible with SAP S/4HANA Cloud for Intelligent Product Design, a new collaboration solution, which enables collaboration in which activities are associatively captured and managed. CIMdata believes social features can provide a good way to capture and leverage knowledge across multiple iterations of a process. Finally, SAP can integrate with any offering that can be accessed using data services or a URL.

The current SAP Product Lifecycle Costing solution is available on-premise running on SAP HANA, but SAP is working on a cloud version. Their current plan is to have the cloud-based solution generally available (GA) by June 2018.

Customer Successes to Date

The SAP Product Lifecycle Costing solution went into GA status in April 2016. Since then SAP has had some market success, with over 30 customers, mainly in discrete manufacturing, like automotive OEMs and suppliers, industrial machinery and components companies, and high-tech firms. AGCO Corporation (AGCO) offers a useful example. Headquartered in Duluth, Georgia, USA, AGCO is a global provider of agricultural solutions, including tractors, harvesters, and other equipment. With global 2016 revenues of $7.4 billion, their 20,000+ employees oversee a wide-ranging business with over 75% of their operations outside of North America. Like many companies, they have many different brands that have unique costing processes and use enterprise resource planning (ERP) systems. With engineering operations at 15 locations, the company turned to SAP for a global solution. SAP Services and an SAP partner, MHP, implemented an integrated cost management capability at five sites in the first seven months, with four others soon to come on line. The solution pulls data from a legacy product lifecycle management (PLM) solution, as well as multiple ERP systems. The company now has one standard process, with the corporate group providing "reference calculations" for key processes as one value add. The results? Integrating their engineering and business systems to support costing provided a solid baseline for their costing efforts. Collaboration by global users reduced time and effort, and helped improve target costing and its achievement. Mr. Nils Franzen, Director Global Product Costing, AGCO Corporation commented that "With SAP Product Lifecycle Costing in place, I really believe we have a best-in class product costing solution that will give us a big advantage going forward."

Given their initial focus on discrete manufacturing, it is not surprising that most of SAP's early customers were discrete. This is beginning to change, according to SAP, with consumer

products companies starting to adopt the solution. Large customers from other than discrete industries such as consumer products, chemicals, and food producing companies have also decided to use SAP Product Lifecycle Costing.

Looking Forward

The big move forward is to offer SAP Product Lifecycle Costing on the cloud in 2018. As this solution will run standalone on the SAP Cloud Platform, it will not be part of the core SAP S/4HANA cloud offering. It will also be priced separately.

Large costing problems are collaborative in the extreme, with participants spanning time zones, cultures, and languages. Recognizing this need, SAP is developing a new product that they claim will enable "intelligent product design in the cloud," and add requirements management and collaboration features to the offering. Engineers will be able to more formally document "should cost" using requirements management features, driving group efforts, all captured by this new product.

The focus to date is on making physical things using a range of manufacturing processes. But how do you cost software? What about applications of the Internet of Things (IoT)? SAP was approached by a large automotive and electronics support company asking that exact question: how do you calculate the price for a subscription-based model of a new IoT-enabled service? Traditional costing is hierarchical and often bottom up. If you know the parts' costs and the costs of processes that result in the end product, you can determine a cost estimate. These new product categories are not hierarchical and need a new way to estimate cost. This is just one of the advanced topics that SAP is considering. Other topics include blockchain and machine learning, a nice synergy with their broader SAP Leonardo initiative, a topic of a recent CIMdata commentary.[1] As products evolve, costing problems will get even more complex, and solution providers like SAP must be ready.

Conclusion

In the best of circumstances product costing is difficult. Companies are less and less vertically integrated, and have to rely on far-flung supply chains and manufacturing operations to meet global customer requirements. Many are conglomerates with multiple (mostly) independent brands and disparate processes supported by different enterprise software. The resulting disjointed processes and associated Excel sheets can defy harmonization. The SAP Product Lifecycle Costing solution was designed with SAP lead customers' input to address this problem. It can leverage enterprise data no matter where it sits, and add it to the vast data and resources from SAP HANA. SAP have over 30 customers using the current on-premise solution, and plan a cloud-based offering in 2018. As they expand out from their beachhead in discrete manufacturing, they will need to add costing support for more and more manufacturing processes, including the many variants of additive manufacturing and composites applications. CIMdata is impressed with their early customer successes, and look forward to learning more about their solutions for new industries as they evolve. While smart connected products are taking over most industrial markets, CIMdata is glad to see solutions like SAP Product Lifecycle Costing helping smart people connect to price them.

[1] https://www.cimdata.com/en/resources/complimentary-reports-research/commentaries/item/9222-navigating-a-new-renaissance-leonardo-and-sap-commentary

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