Accelerating Digital Transformation
in Manufacturing with Configuration Lifecycle Management (CLM)

How to establish a collaborative single source of truth across your organization to improve time-to-market and increase product quality

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Executive Summary

Manufacturers are facing digital disruption on many fronts. Industry 4.0 and new customer demands for personalization require investment in smart factories and adoption of new business models like servitization.

This is forcing manufacturers to rethink how products are designed, manufactured and sold. With increased digitalization, automation, and software in products, ensuring consistency and reliability in the delivery of products to meet customer needs is now critical.

Configuration Lifecycle Management (CLM) ensures consistent product configuration data across all functions - from engineering and sales to manufacturing and service. In other words, from end-to-end. CLM establishes a single source of truth on the thousands of potential product configurations that can be manufactured, sold and delivered to customers.

By implementing a CLM solution, manufacturers of complex products can improve time-to-market, lower risk, increase product quality and ensure a seamless product lifecycle.

Furthermore, CLM provides a reliable single source of truth foundation that can be updated in real-time to reflect changes in configuration options available and thereby enables companies to adapt to new market trends, customer demands and business models faster than the competition, providing them with a compelling competitive advantage.

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Disruptive transformation

Manufacturing enterprises are currently in the midst of a major digital transformation. Industry 4.0 is leveraging the latest advances in artificial intelligence, robotics, Internet of Things (IoT) sensors and communication technology to enable smart-factories capable of operating themselves.

Gartner uses the term "smart factory" to describe the above trend as one of the top 10 strategic technology trends in the manufacturing industry in 2020[1]. The smart factory transformation will take many years, but manufacturing enterprises cannot afford to wait as they will risk becoming obsolete.

As the factory floor is being made more intelligent, the software solutions supporting the smart-factory also need to adapt to the new Industry 4.0 paradigm. Intelligent systems are only as good as the input data they receive, and bad data can have catastrophic consequences in automated autonomous systems.

Ensuring a reliable and consistent source of operational data is therefore essential. This single source of truth reduces the risk of producing, selling and delivering the wrong products. It also enables all departments to work in a flexible and agile manner, safe in the knowledge that the operational data on which they base their decisions is reliable and consistent.

1.Source: Gartner 2019, "Top 10 Strategic Technology Trends for Manufacturing Industries: Smart Factory"

Evolving customer experience demands

In Deloitte's "Tech Trends 2019: Industrial manufacturing perspective," they note that "industrial manufacturing firms are speeding their adoption of advanced technologies."

Deloitte goes on to note that "Industrial manufacturing is set to transform from mass production to increased personalization and customization of products." Gartner has also identified personalization in its top 10 strategic trend for manufacturing industries.

Increased personalization and customization requires agility and flexibility, but also a common, shared truth of what is possible and what is not. Customers need to know which options are valid when ordering a product and they also need to know which options are no longer valid once a choice is made. This information needs to be consistent with the original product design and current manufacturing capabilities including parts and material availability.

Personalization and customization are intended to enhance the customer experience, but not delivering on that promise can prove more damaging than never making the capability available.

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Manufacturers adapting to new business models

Manufacturers are adapting to the demands of Industry 4.0 and evolving customer demands for personalization and customization by exploring new busines models for how they deliver value. Some manufacturers have questioned whether customers need to own products and now provide "pay-as-you-go," leasing and subscription models.

This "servitization" of products effectively reverts ownership of the product back to the manufacturer, including the service and maintenance burden that this entails. According to Gartner's "Digital Business Model Compendium," servitization is a business model that evolved due to digital disruption and is one of the ways companies can increase their odds of success. This means that manufacturers are now more conscious of the operational efficiency of their products and need to design for low-cost maintenance.

This is leading some manufacturers to increase the software content in their products. By manufacturing more generic products, options and configurations can be enabled via software either by technicians in the field or by the customer themselves.

For this approach to deliver a low-cost maintenance solution, it is critical that the rules governing configuration options are consistent from engineering through manufacturing to sales and service.

From fragmented to interconnected systems

Most manufacturing enterprises have dozens of software systems to manage all aspects of their operation from manufacturing to sales and fulfilment.

The systems used have often evolved from a focus on one specific business function or process, such as Product Lifecycle Management (PLM), Computer Automated Design and Manufacturing (CAD/CAM), Enterprise Resource Management (ERP) and Customer Relationship Management (CRM). Some, such as ERP systems, have expanded to take on more tasks, but the focus of the system is still rooted in its original purpose

Each of these systems have their own data, represented in their own way requiring costly and sometimes complicated integration. However, each system maintains its own "truth," which can lead to inconsistencies from one system to the next. End-to-end manufacturing processes cut across these systems and today rely on the accuracy and consistency of data in each system along the path.

Too often, inconsistencies arise that can halt the entire process as a determination is made on which system best reflects the "true" data and should be preferred over alternative sources. Customers can experience this as options that are not possible for their product, or simply not available at all, leading to dissatisfaction and disgruntlement.

In the worst case, inconsistencies can lead to major product recalls, which are extremely damaging for any company's reputation.

Ensuring a "single source of truth" across system boundaries is essential for end-to-end manufacturing processes, especially in the face of Industry 4.0 disruption and customer demands for increased personalization of products.

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Ensuring consistent product configuration data from end-to-end

One of the areas immediately affected by the above trends is product configuration.

Even without customization and personalization, many manufacturers struggle with products that offer a vast array of options leading to thousands of possible configurations.

Knowing what is not possible is just as important, if not more important, than knowing what is possible. This is not only true for the original product design, but also in real-time scenarios as issues can arise with the availability of parts and materials necessary for certain configuration options.

Managing the vast complex of rules and limitations dictating configuration options requires a solution capable of scaling to not only meet requirements today, but also as demand for personalization and customization increases. It also requires a real-time solution that can be easily updated with new information that is immediately available to all.

These are the challenges that Configuration Lifecycle Management (CLM) solutions address.

The CLM single source of truth

A CLM approach provides a means of defining and managing rules that dictate how product options can be combined into specific configurations.

The true value of CLM is that once these rules are defined, they provide a single source of truth for product configuration information that can be used end-to-end, from design to manufacturing, sales and service.

For any new product design, there are thousands of potential option combinations that can be considered. Using CLM in the product planning phase enables these options to be considered and stored along with the rules governing the validity of configuration options.

Separate views of this combined information can be provided to different users depending on their needs.

For example, product designers are not interested in sales options and don't need to see these additions; manufacturing is only interested in product configuration options important to sourcing materials and planning production; sales only needs to see options that are important in determining if the product configuration requested by customers can be sold; while service technicians need to understand the configuration options associated with specific products to provide maintenance, replacements or upgrades to deployed products.

While the product configuration rules are the same, each user is only presented with the information that is important for their role, safe in the knowledge that there is full consistency from end-to-end.

This is the first step in establishing a "single source of truth," which can be enhanced during product design. Sales can then add additional options that are related to how product configuration and pricing options are presented to customers.

CLM single source of truth benefits

The benefits of a single source-of-truth are faster time-to-market with lower risk, higher product quality and a seamless product lifecycle. Complex products are delivered to market faster as all departments are working from the same configuration data without the need to copy or create their own version of the truth. This also avoids mistakes and misinterpretations leading to lower risk of misconfigured products and therefore higher quality delivered. The single source of truth is valid throughout the lifetime of the product aiding in service and maintenance as well as upgrades and repeat sales.

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CLM as a catalyst for digital transformation

A CLM approach provides manufacturers the basis for addressing a critical issue today, namely ensuring a consistent, reliable, single source of truth for product configuration options from product design to manufacturing, sales and service.

This enables manufacturers to be responsive to emerging customer and market trends, as well as considering new business models and ways of working that can be more efficient.

For example, some manufacturers are challenging the traditional approach to new product definition where engineering defines the product, manufacturing makes it and sales sells it. To ensure that new products can be manufactured, sold and serviced effectively, manufacturers are encouraging closer collaboration and input from all departments in the planning and vetting of new product ideas.

With CLM it is possible for all these departments to collaborate and define rules governing which configuration options should be supported based on informed feedback.

These rules are maintained and refined throughout the product design, manufacturing and sales processes ensuring both consistency and low-risk of errors once products are deployed.

CLM thus provides the basis for a new way of working that can lead to more effective and successful products while also providing the agility for manufacturers to explore new business models and take advantage of the latest trends in the market.

It ensures that the benefits of faster time-to-market, lower risk, higher quality and a seamless product lifecycle are also resilient to new disruptions in the market driven by new technologies, new business models and new customer demands.

Getting started with CLM

As a global leader in the CLM market, Configit can provide guidance to customers on their CLM journey. One of the first questions often posed is "where do we start?"

Introducing a new solution is always disruptive, so the answer depends on where there is an immediate need and where immediate benefits can be harvested.

This provides manufacturers with two starting point options:

1. Focus on improving sales with a sales configuration solution
2. Focus on improving product data with an enterprise product configuration solution

CLM for sales configuration

Many manufacturing companies with complex products offer thousands of options to customers including commercial options. Quoting a price can be an enormous challenge and if not carefully managed, customers can find that the options they have chosen cannot be delivered.

With a sales configuration solution, it is possible to establish a single source of truth for sales configuration options. Rules are established that define the interrelationships between options and are used to govern which options can and cannot be combined. These rules can also be updated in real-time providing the salesforce with up-to-date information on what is possible to deliver.

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CLM for enterprise product configuration

For manufacturers with very complex products and vendor dependencies that can affect availability of product options for manufacturing and delivery, starting with an enterprise product configuration solution can provide immediate benefits.

CLM can be used as part of the product design process to capture the rules governing product option combinations and other configurations. But the true value is realized in production when real-time events can affect the availability of certain product configurations.

For example, if a certain paint color is required for a specific product configuration, but cannot be sourced from the vendor, manufacturing and sales need to know that this configuration cannot be delivered and sold. The alternative is dissatisfied customers.

Different starting points, but same end-goal

Whether the CLM journey is used first for sales configuration or product configuration, once this single source of truth is established, it can quickly be adapted to meet the needs of all departments. Once the CLM solution is adopted from end-to-end, manufacturers can extract the maximum benefit of faster time-to-market, lower risk, higher quality and a seamless product lifecycle.

Configit CLM solutions

Configit is a pioneer in the field of CLM. The Configit Ace® product powered by Virtual Tabulation® technology provides the single source of truth capability at the heart of CLM.

Virtual Tabulation® allows all of the relevant product configuration options to be defined including the rules governing each configuration option, no matter how many millions of rules there are. Specific views can then be provided depending on the user's function and role.

For example, the Configit Ace® for Enterprise Product Configuration solution provides product designers with the tools required to define rules governing product design configuration options.

The Configit Ace® for Sales Configuration solution provides sales resources the capability of adding rules that are specific to product configuration options important in the sales process.

Configit Ace® provides users of each solution with only the information that is relevant to their roles.

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To arrange a demonstration and learn more about:

- Configit Ace® powered by Virtual Tabulation®
- Enterprise Product Configuration
- Sales Configuration

Schedule a demo with Configit

At Configit, we help our customers globally to master the challenges of getting configurable products to market faster, with higher quality and engineered at lower costs. As a pioneer of Configuration Lifecycle Management (CLM), we have been instrumental in driving the adoption of CLM solutions globally. The Configit CLM solution is the first of its kind to connect and enable collaboration across functions - from engineering and sales to manufacturing and service - by ensuring the entire organization is operating from the same data. We call it a single source of truth, which provides companies with comprehensive, accurate and easily accessible data of all their configurable products.

Trusted by the world's largest manufacturing companies for their mission-critical digital transformation projects, our advanced configuration platform built on patented Virtual Tabulation® technology handles the most complex products on the market.

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