Benefits of Model-Based Definition (MBD) for Product Development Teams
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For over a hundred years, design and manufacturing organizations used manual drafting techniques to define design intent. By the late 1970s, this process was being replaced by computer-aided design (CAD) tools and processes. These new tools facilitated the age-old method of creating 2D drawings. This technology matured such that 3-dimensional, solid models, with mechanical properties and attributes could be simulated and used to create these two-dimensional drawings.

Industry leading organizations are now moving away from traditional 2-dimensional drawings completely, as new technologies have made them redundant and expensive. Through elimination of duplicative processes, and increased data quality, a new method known as Model-Based Definition (MBD) offers businesses, small and large, a competitive edge, via speed, agility, and ultimately profitability.

It isn't difficult to make the case for an organization's transition to MBD. Creating 2D drawings from 3D solid models is a time-consuming and duplicative effort, prone to human error. The resulting work product is then only an interpretation of the design intent which will then be communicated to various consumers who will have their own interpretation. The solid model is the single item of truth and authority of the design intent.

An effective transition to MBD has resulted in the following benefits to many design and manufacturing organizations.

1) Significant reduction of time consuming duplicative tasks, leading to significant reduction in cycle time and cost.
2) Reduction of errors by reducing opportunity for error at every function that consumes product definition.
3) Manufacturing processes are automated via digital thread of data allowing communication between engineering data and manufacturing processes and machines. This data is typically computer numerical controlled (CNC) and derivative of the original CAD data.
4) Unambiguous manufacturing data is consumed by manufacturing and quality functions thereby reducing errors and cost.
5) Parametric driving of Bill of Material (BOM) to improve procurement and purchasing cycle time.
6) Improved cycle time for release and change management processes.
7) Opportunity to digitally feed other processes and support complete Model-Based Enterprise.

Furthermore, for some industries such as the Aerospace and Defense industries, which typically have lagged behind consumer industries, the MBD method is moving toward being standardized by the U.S. Federal Government. The U.S. Department of Defense (DoD) published Revision B of its Military Standard- 31000 in 2018. In this revision it fully defines requirements for model-based data to be delivered throughout its contractor supply chain. Some other government, industry and commercial standards are doing the same.

An effective transition to Model Based Definition techniques will require an organization to go through a transformation to new processes and tools. This will require extensive training and higher skill sets or personnel.