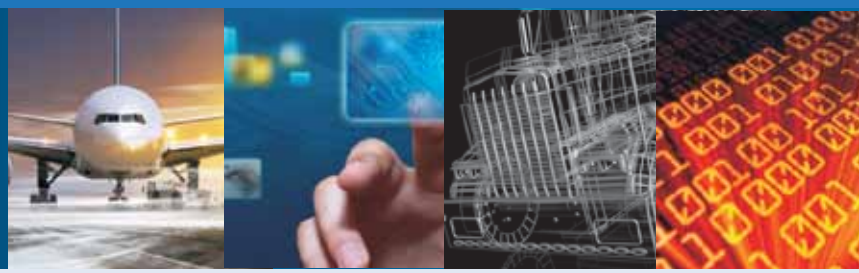
Transforming Engineering and Manufacturing Processes with Model Based Enterprise



Organizations throughout the automotive, aerospace and off-highway industries are challenged to have an effective and affordable collaborative design-to-manufacturing environment, in which product information is always up-to-date and can be accessed as a "single source of truth" across all stakeholders.

Many manufacturers struggle to effectively communicate 3D design intent to downstream users successfully. This is largely due to the practice where 2D drawings, derived from native CAD models and assemblies serve as master data for downstream users. This is further complicated by globally dispersed engineering and manufacturing teams using different CAD and PLM tool.

All of which leads to significant mis-communication of design intent, manufacturing rework and supplier errors and delays.

Enterprise challenges with 2D data exchange and collaboration

- Significant effort is spent in creating & updating 2D drawings with design updates
- Difficulty in interpreting design intent from 2D drawings based manufacturing documents
- Difficulty updating dependent paper processes when there is a new engineering or manufacturing revision
- Supplier data is not in sync with engineering released data, leading to scrap and longer turnaround time
- Protecting intellectual property with global collaboration

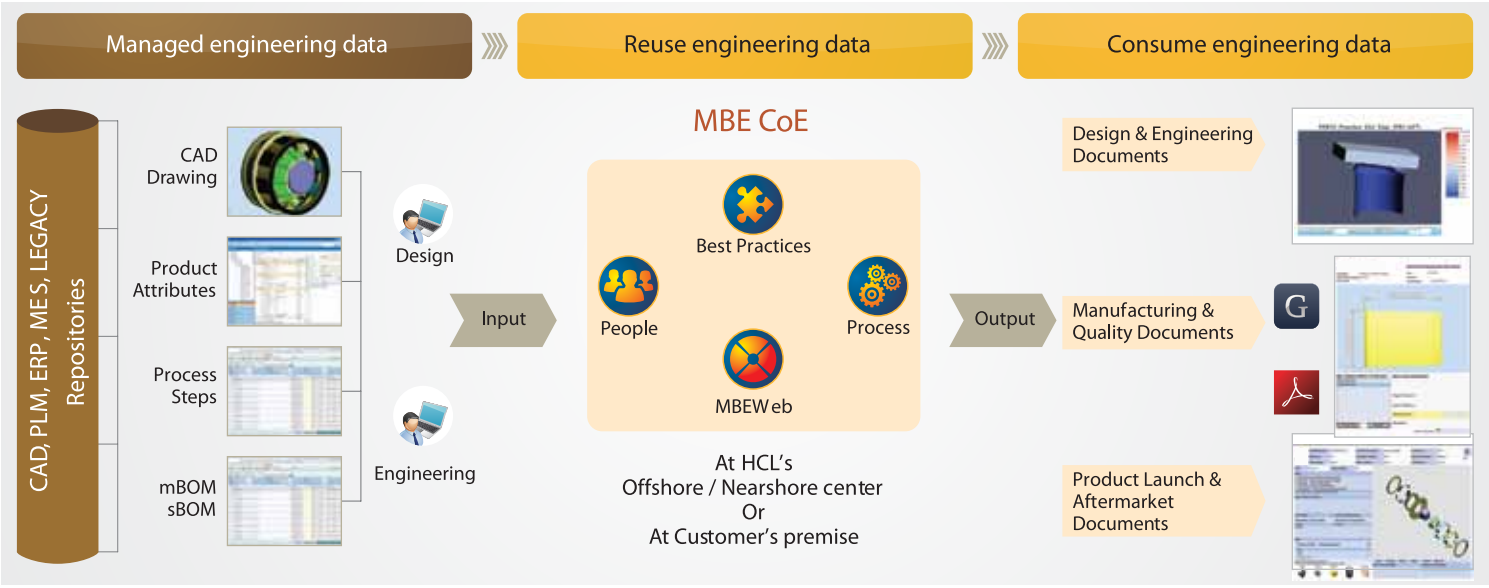
To address these challenges, the U.S. Department of Defense developed a Model Based Enterprise (MBE) approach, which is now being adopted by leading aerospace and defense organizations as well as commercial manufacturing enterprises.

MBE establishes a complete 3D product definition through the use of 3D Model Based Definition (MBD) practices like 3D dimensions and tolerances; as the master across the extended enterprise. MBE also promotes the reuse of these 3D CAD MBD models through open platforms as opposed to recreation them during the product development process when different CAD modeling tools are required and preferred.

HCL's CoE can enable enterprise adoption of Model Based Enterprise

HCL's Centre Excellence of provides a central source standardized processes, of expertise, tools and best practices deploying for a Model Based Enterprise. Anark Core MBEWeb™ is the key enabler for the CoE. It transforms native 3D CAD parts and assemblies, together with their attributes, dimensions & tolerances, product views, and other model based definition (MBD) into "fit for purpose" & "free to view" 3D HTML and 3D PDF MBE applications and manufacturing documents.

The CoE enables MBE services deployment with higher quality, low upfront investments and reduced risk and disruption for our customers.



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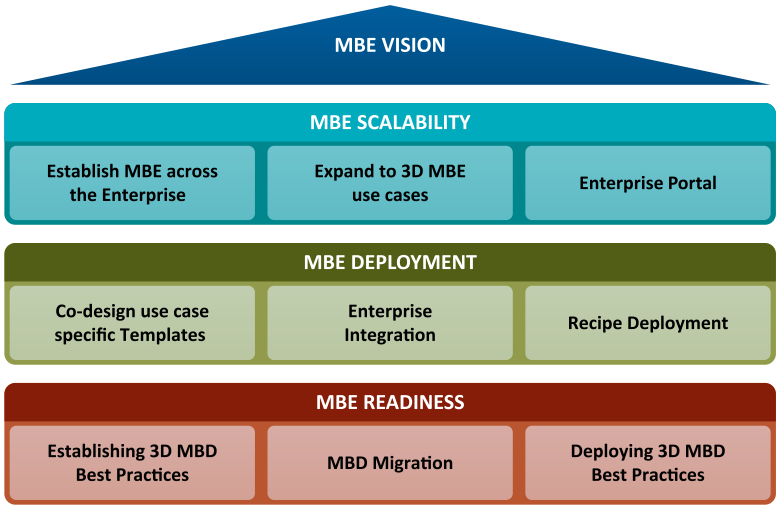
CoE Approach



CoE typically goes through a three-stage evolution

MBE Readiness: Many companies still have 2D drawings-centric product development processes. The 'Readiness phase' is the first step toward formalizing processes, making them model-centric for effective design to manufacturing collaboration. HCL will implement 3D Model Based Definition (MBD) best practices and migrate PMI, GD&T and annotations from 2D drawings to 3D models, elevating customer's design and collaboration process by making it MBE ready.

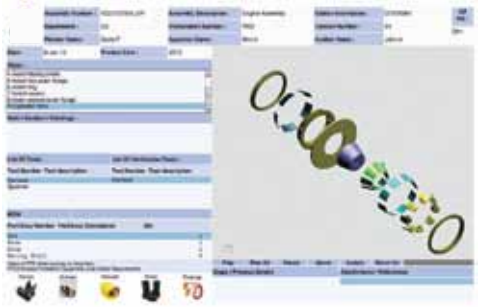
MBE Deployment: This step includes the deployment of Anark Core MBEWeb™. Anark Core MBEWeb™ tightly integrates with your enterprise data repositories (like CAD, PLM, ERP etc.) to harvest the complete engineering product definition. Then repurposes that production data into "fit for purpose" engineering and manufacturing MBE documents. 3D PDF and 3D HTML Templates form the foundation of this solution. HCL's engineering and manufacturing teams will work with customer subject matter experts to co-develop these templates and implement data bridges to the requisite CAD, PLM, ERP, MES & legacy enterprise software systems.

MBE Scalability: In this step, HCL will assist the customer in expanding their definition and usage of MBE process documents to address additional use cases, such as quality, servicing and maintenance thereby establishing MBE approach across the extended enterprise.

MBE Usecases

Engineering Release & TDP

Work Instructions



First Article Inspection

Hello, I'm from HCL's Engineering and R&D Services. We enable technology led organizations to go to market with innovative products and solutions. We partner with our customers in building world class products and creating associated solution delivery ecosystems to help bring market leadership. We develop engineering products, solutions and platforms across Aerospace and Defense, Automotive, Consumer Electronics, Software, Online, Industrial Manufacturing, Medical Devices, Networking & Telecom, Office Automation, Semiconductor and Servers & Storage for our customers.

Geometric is now a part of HCL Technologies

For more details contact: geometricplm@hcl.com
Visit our website: http://geometricglobal.com/plm-services-and-solutions/plm/model-based-enterprise/