



## Condition-based and Predictive Maintenance (CBM+) in Federal, Aerospace and Defense (FA&D) Industry

Condition Based Maintenance (CBM), a subset of Reliability Centered Maintenance (RCM), is the dominant cost saving best practice for U.S. DoD global sustainment operations and the way to improve profitability for Performance Based Logistics (PBL) contracts.

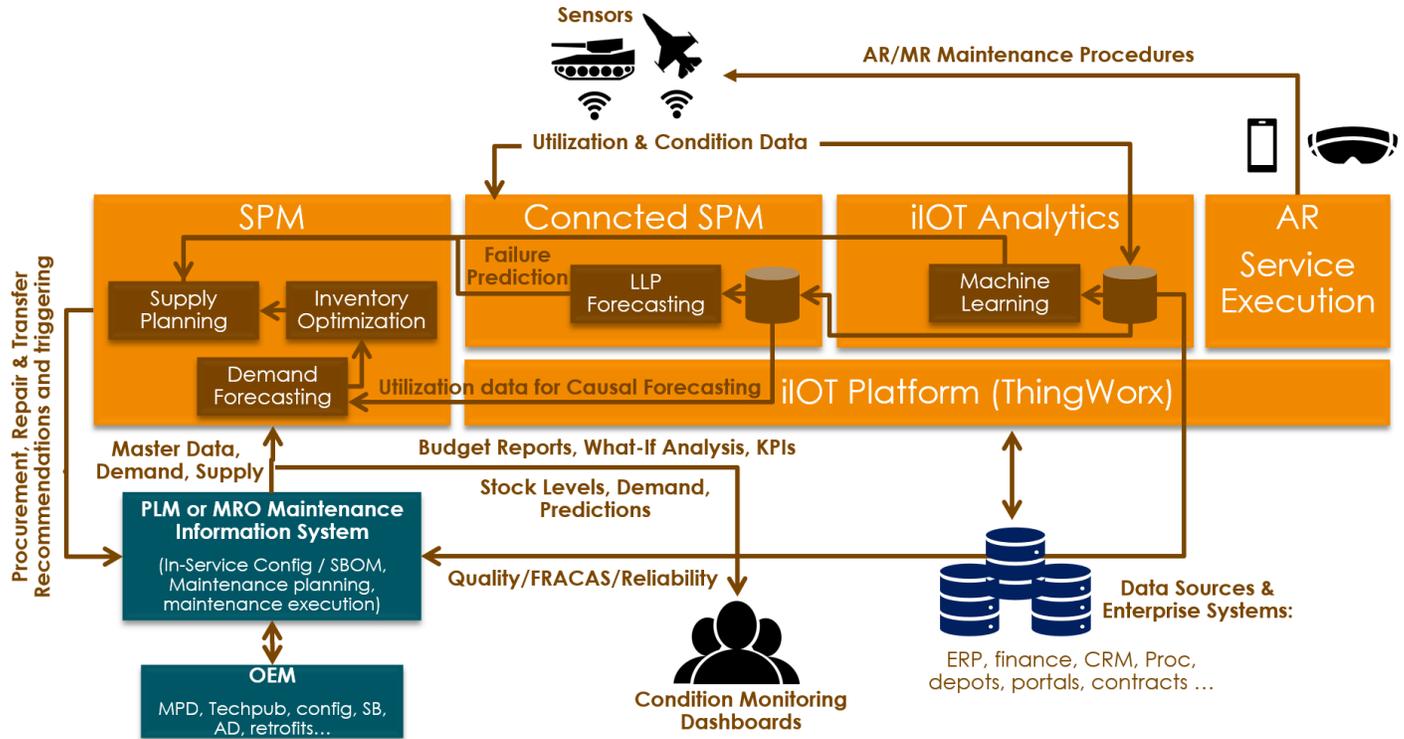
For commercial Aviation Maintenance, Overhaul and Repair (MRO) operations CBM policies have been directed for mission-critical systems, such as: engine maintenance, airframe maintenance, component maintenance, etc. and increased overall maintenance effectiveness for all participants in the MRO network.

CBM+ is maintenance performed based on evidence of need (*only when it is needed*), integrating reliability centered maintenance (RCM) analysis with those enabling processes, technologies, data and capabilities that enhance the readiness and maintenance effectiveness of systems and components.

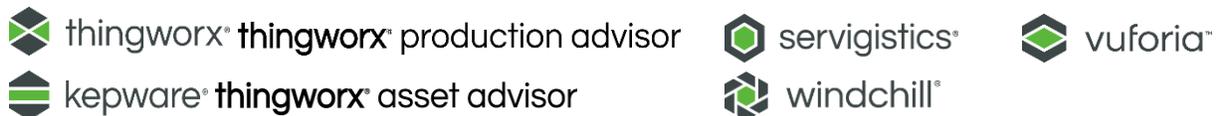
## Abstract: Condition-based and Predictive Maintenance (CBM+) in FA&D Industry

In the core of the **PTC CBM+ solution** is **ThingWorx IIOT Platform**, which enables seamless connectivity between the systems, above, with the PTC mission-critical solution of **Service Parts Management (SPM)** for Spare Parts Supply-chain planning, Inventory Optimization and Demand Forecasting. Additionally, **Connected Service Parts Management (C-SPM)** capabilities enable proactive assets and parts utilization planning and failure prediction. Analytics and Machine Learning capabilities enable to predict when maintenance should be performed and create time-based preventive maintenance orders.

**PTC Augmented Reality (AR) capabilities**, connected into the CBM+ architecture will boost maintenance procedures and training with interactive AR-based work instructions.



**ThingWorx IIOT Platform** with the help of IoT sensors, constantly collects data on the operational status of assets and fed to machine-learning and data-analytics systems that predict maintenance requirements in real time.



### PTC CBM+ Solution Offer Values, and KPIs



- 18% increase in inventory turns (**Metso**)
- 95% Service parts availability (**Qantas**)
- 10-20% inventory reduction (**Pratt and Whitney**)
- 6% increase in Aircraft availability (**US Coast Guard**)
- 12-month ROI in less than 12 months (**JLG**)