

Advancing The Digital Thread Throughout The Lifecycle

GLOBAL PRODUCT DATA
INTEROPERABILITY
S U M M I T
2022



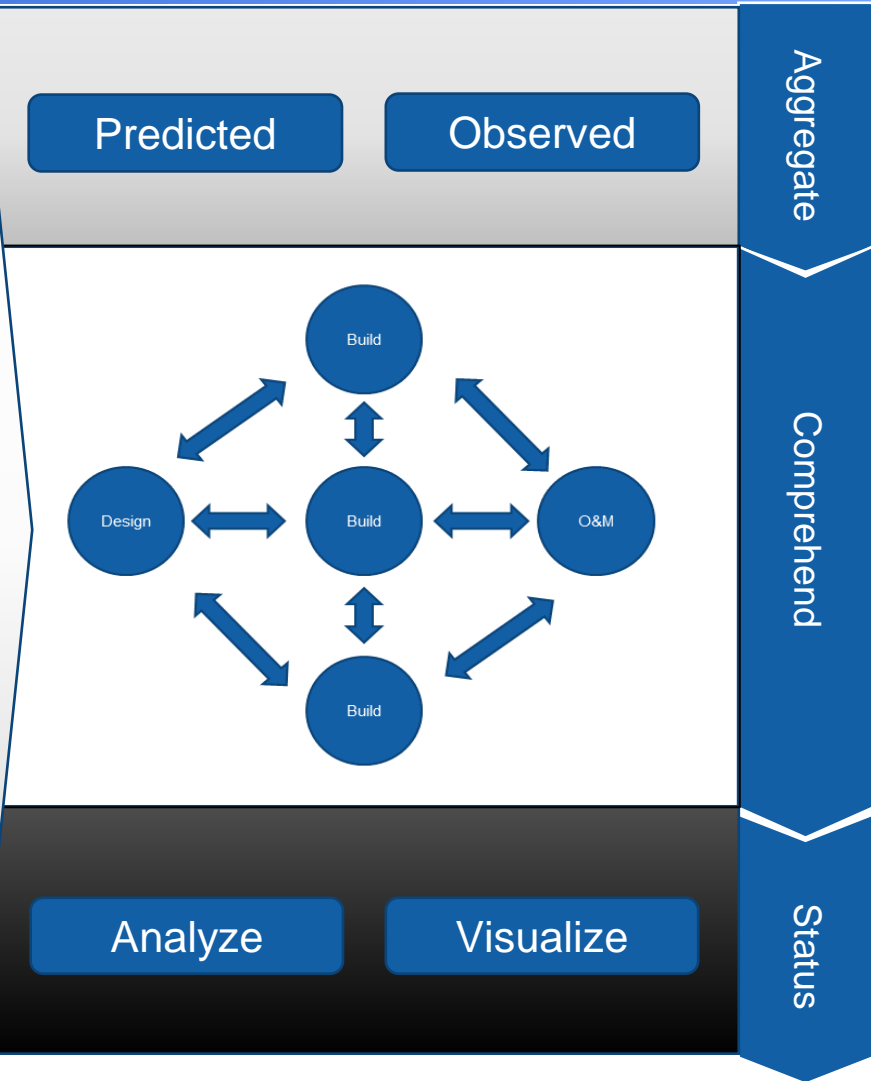
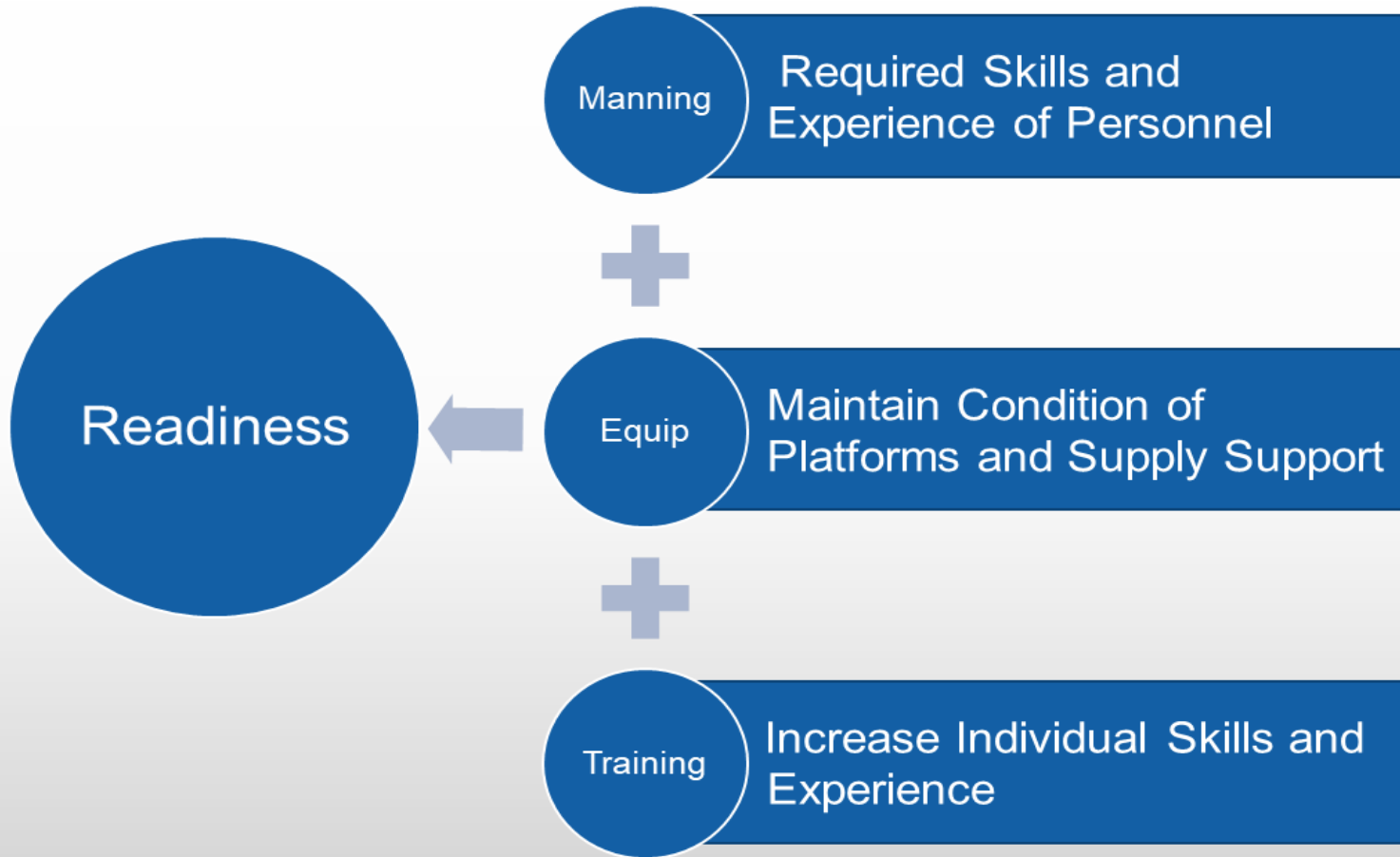
Presenters Bio

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- Kenney Crooks is a NG Fellow for Reliability and Model Based Sustainment for Northrop Grumman's Aeronautics Sector.
- In this role, Crooks oversees Reliability, Maintainability and Testability program activities and Digital Transformation of tools, processes and training for Product Support for the NGAS sector.
- In Crooks' 14 years career at Northrop Grumman, he has lead efforts on various programs, JSTARS, UK AWACS, E-2D, Triton, NATO AGS, Strike Division, FAARA, FLRAA, Sentinel.
- Crooks holds a Bachelor's degree in Information Technology Management from Barry University, Master's degree in System Engineering from Florida Institute of Technology.

Readiness Model

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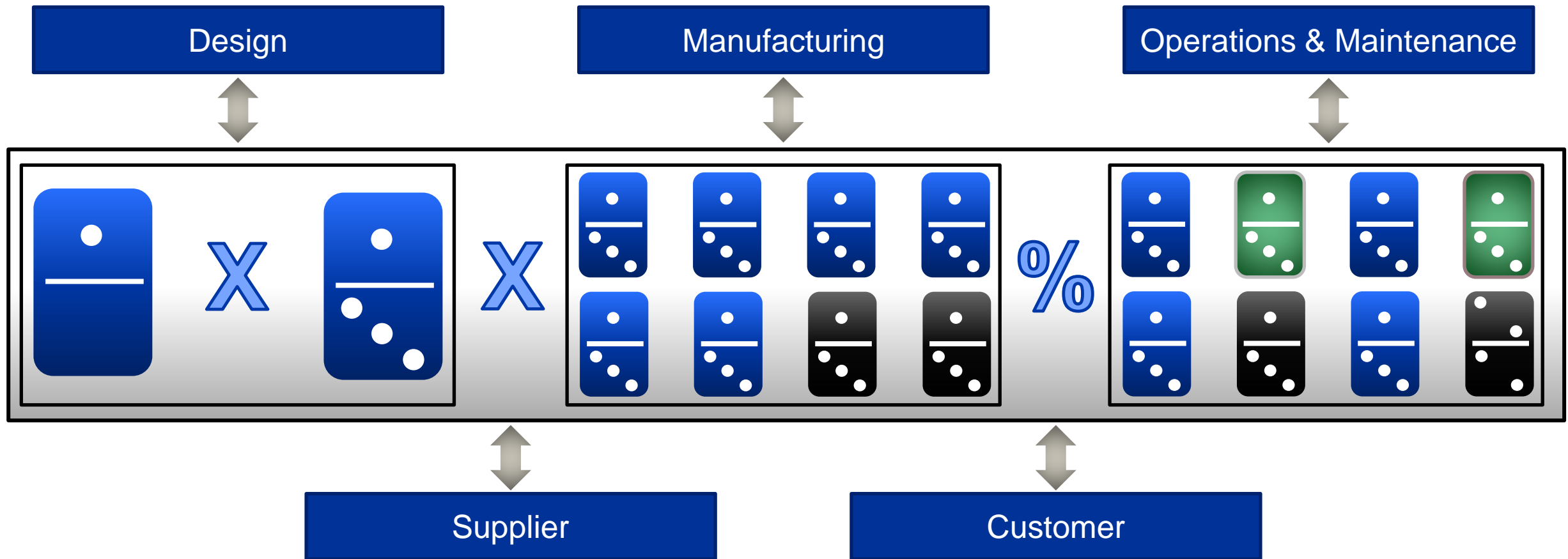


Improving Readiness

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Objective

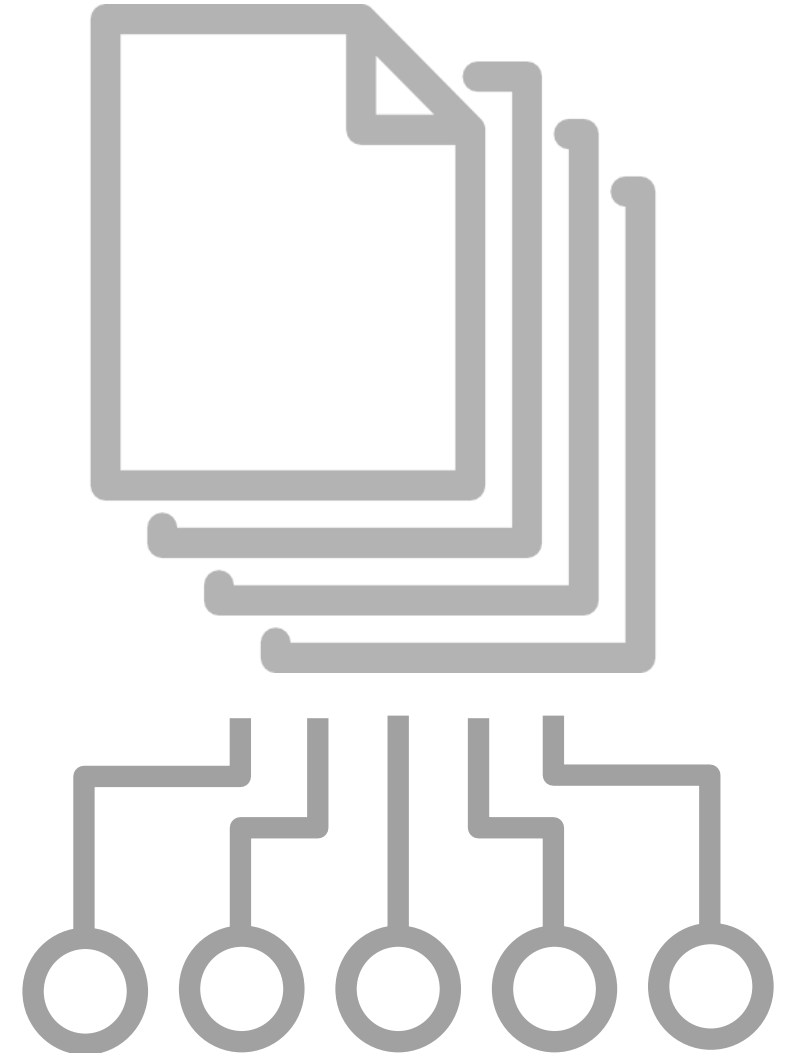
Retaining connectivity throughout the entire life cycle that is sustainable for Modeling and Simulation capabilities in support of program requirements and operational readiness.



Digital Transformation

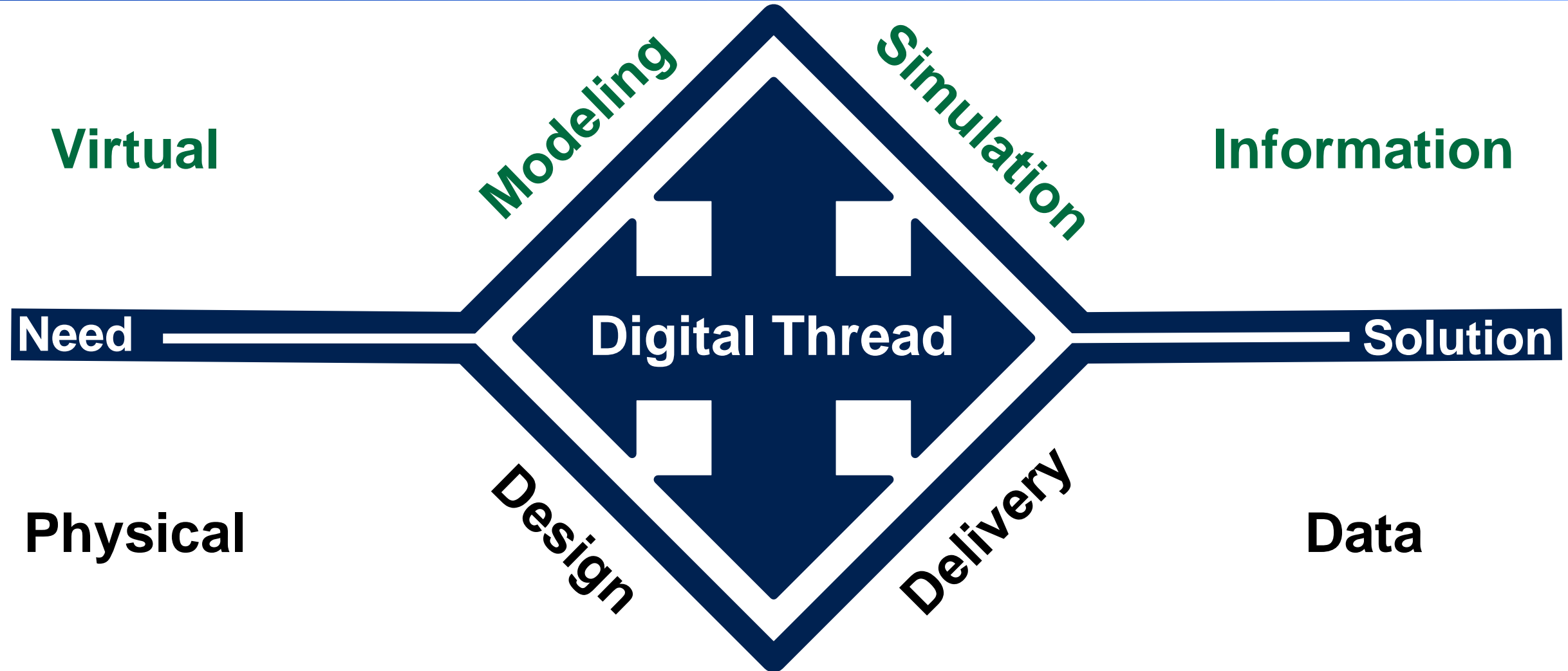
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- Develop robust Modeling and Simulation capabilities for the entire life cycle
 - Drive innovation for information and insight
 - Improve operational excellence
 - Increase collaboration and experience
- Promote data reuse from design to operations and maintenance through the Digital Thread
- Evolve to Model Based and Model Centric approaches with Digital Technologies



Digital Twin

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Shift Left - Model Based Sustainment

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Collaborative Digital Environment
Establish connectivity throughout life cycle

Define touch points with design to ensure Sustainment is considered upfront

Scalability
Identify Supportability impacts early in design

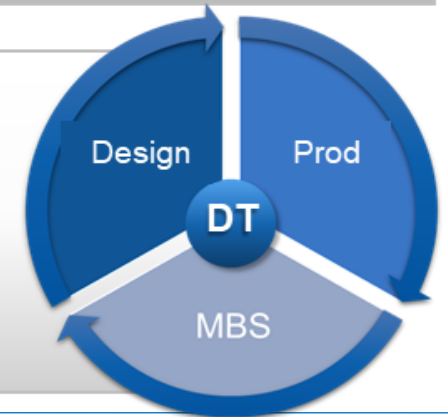
Establish feedback loop on sustainment impacts throughout the development of engineering design and drawing sign-offs

Develop Digital Backbone
Define governance and traceability

Strengthen Digital Thread through common interfaces to drive innovation and improvements

Bringing Sustainment to the left in design and integrating with Engineering

- Improve availability, supportability, maintainability and reduce rework
- Drive efficiency, affordability, and agility through data integrity and re-use
- Show ownership of total life cycle

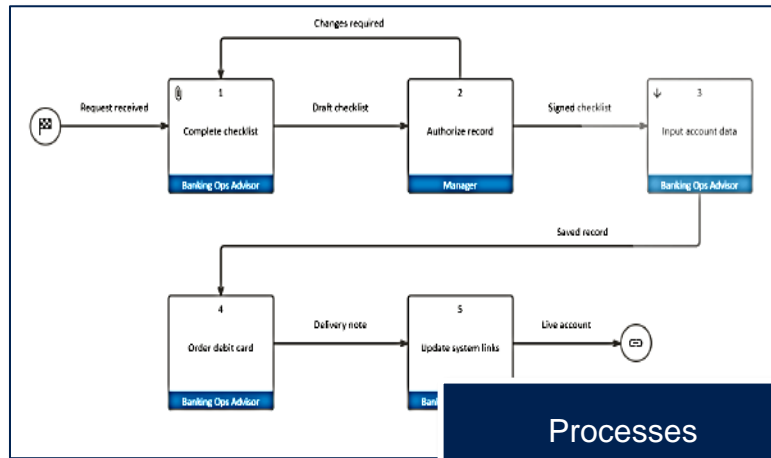


Define, Maintain and Sustain our products from “cradle to the grave”

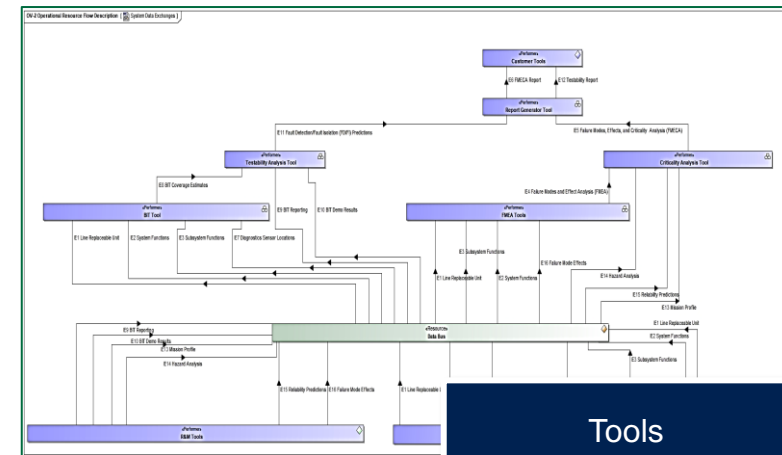
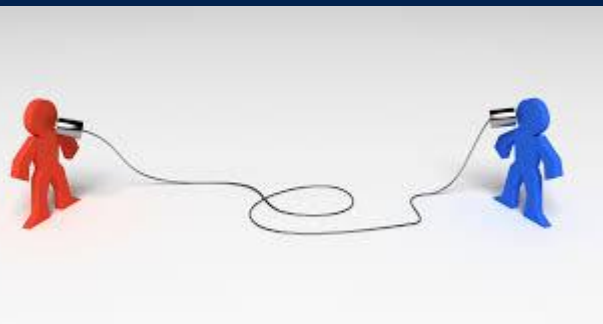
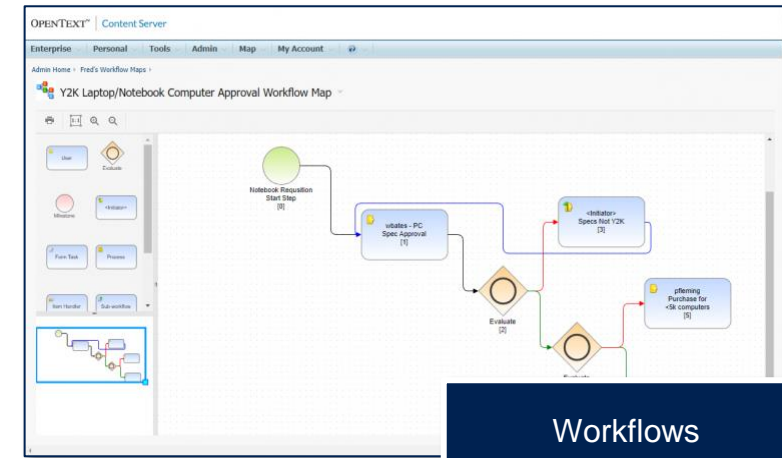
Digitalization – Starting Point

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Processes

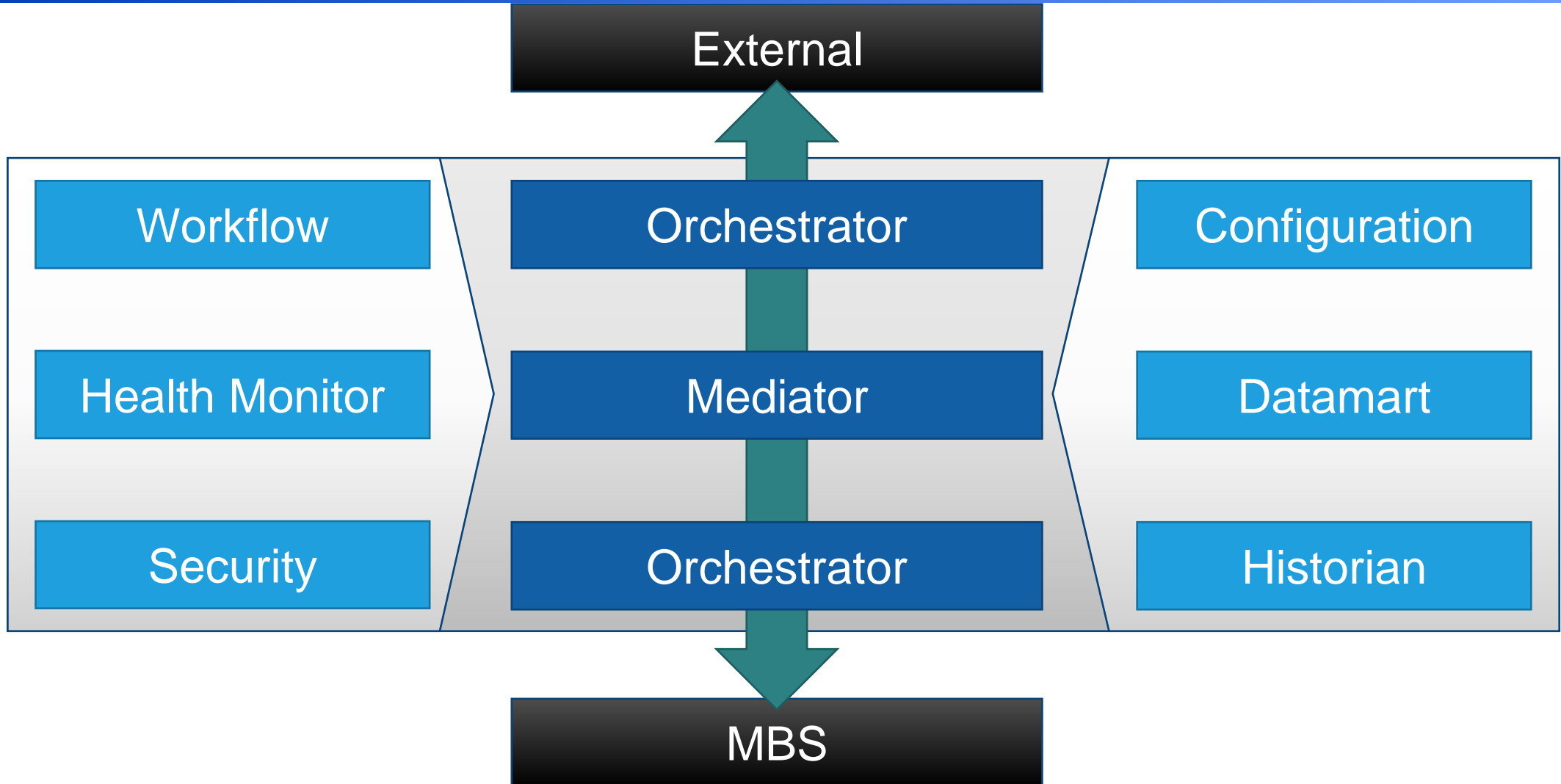


Processes



Technical Stack – Digital Backbone

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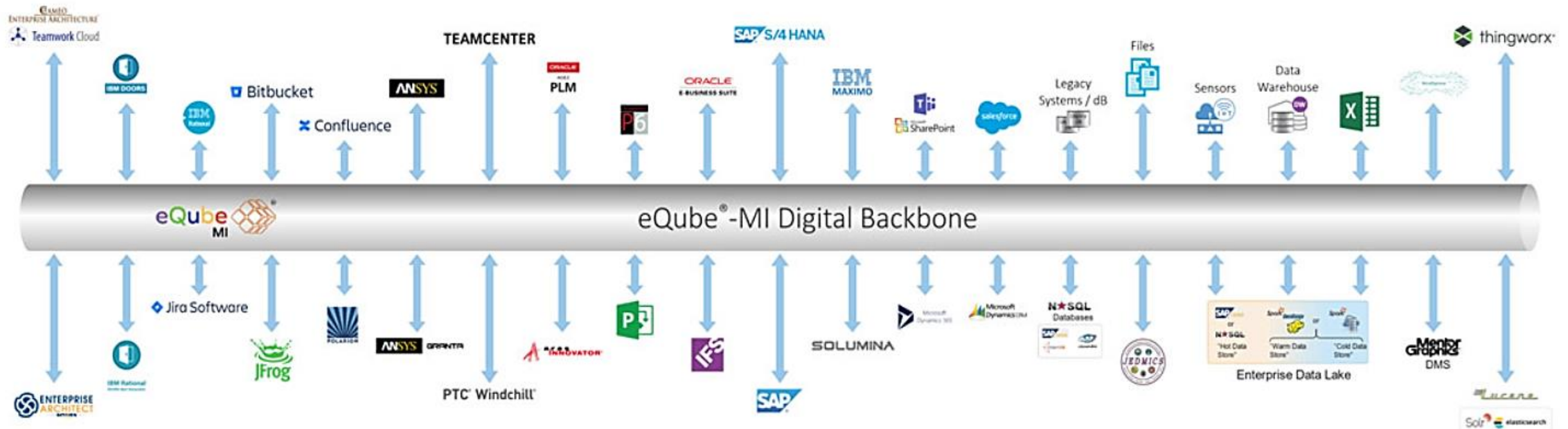
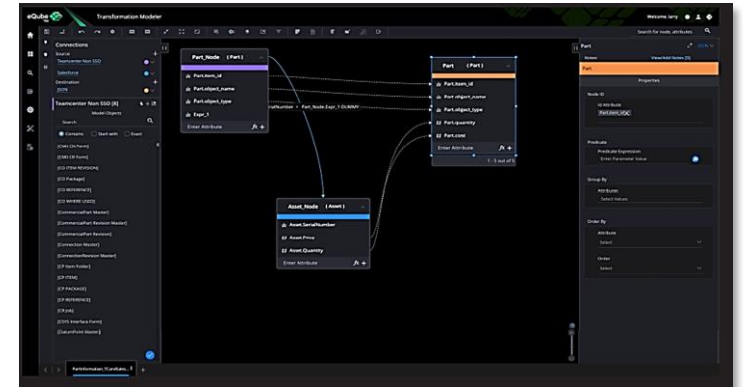


eQube – Orchestrator

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Data as a Service (DaaS) platform

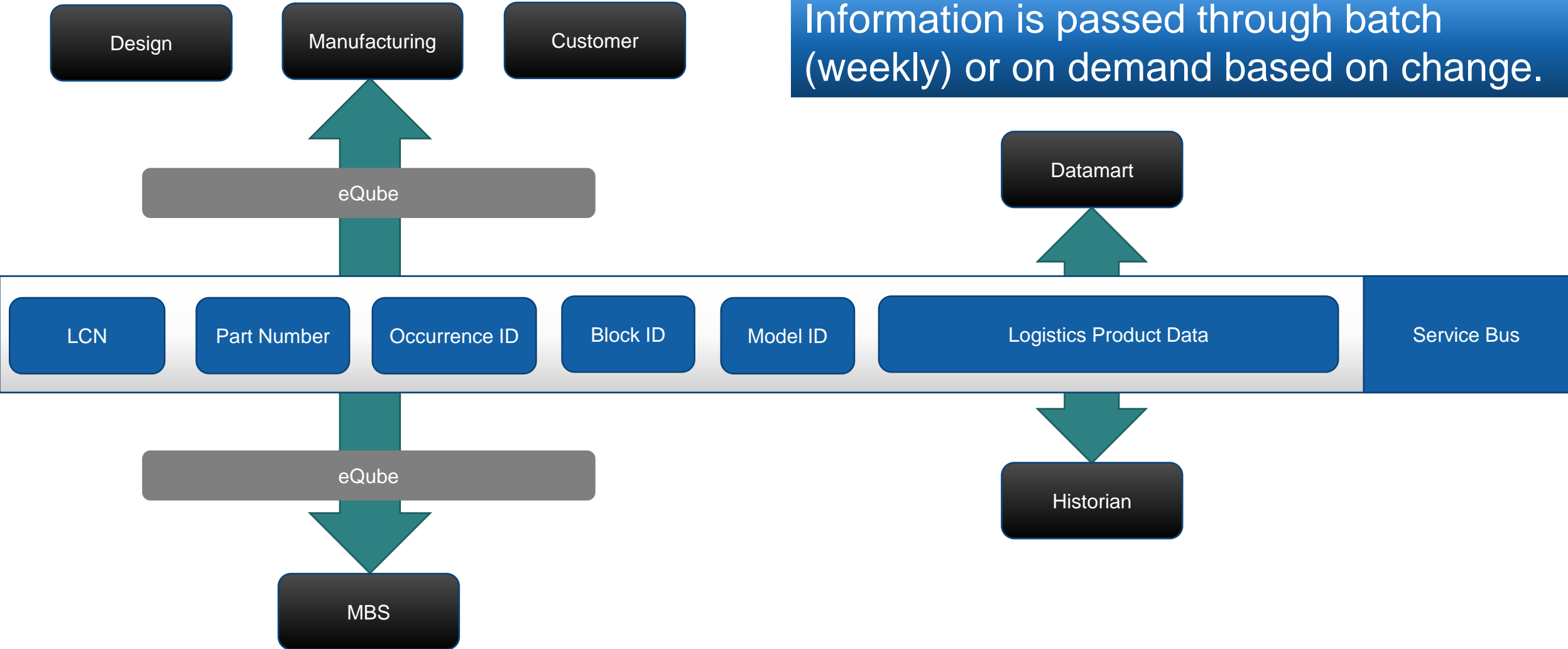
eQube platform forms a Data Fabric of integrated data, applications, and devices that puts the power of analytics in the hands of end-users.



Service Bus - Mediator

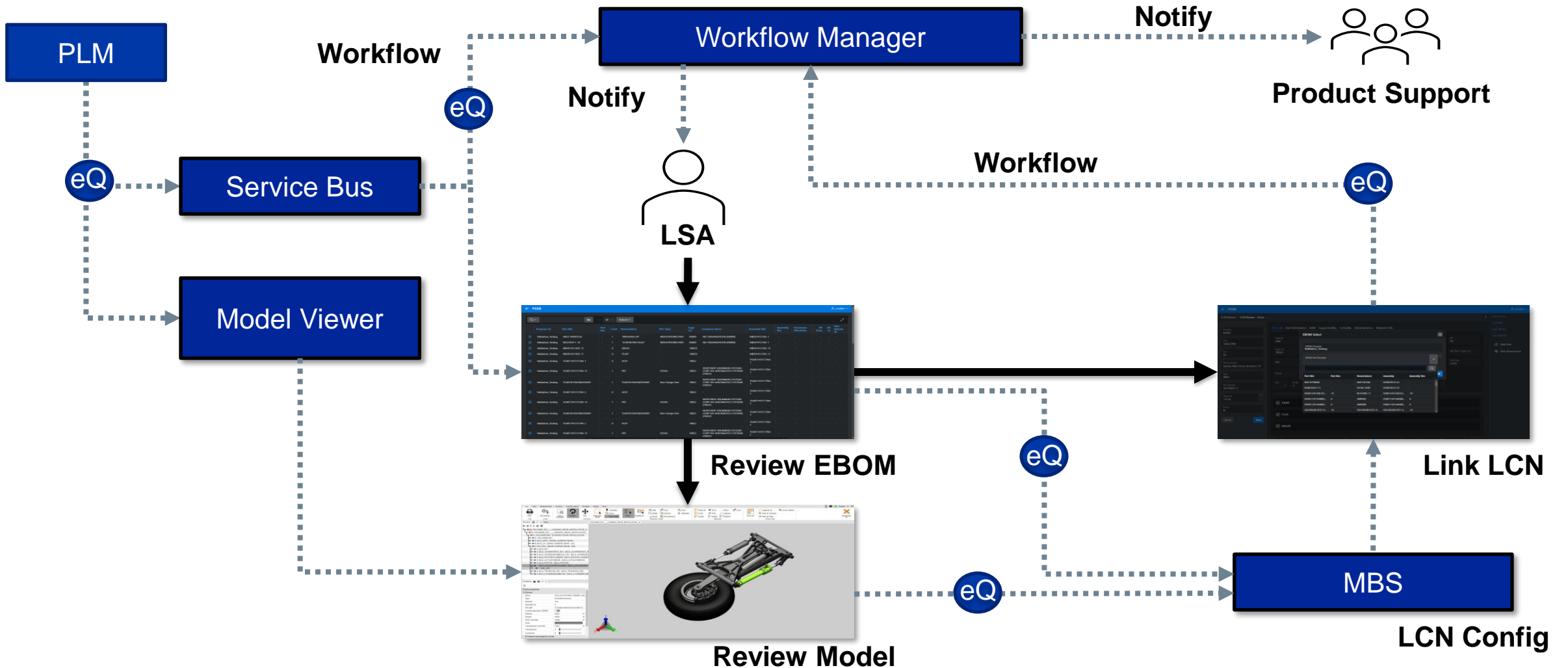
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Information is passed through batch (weekly) or on demand based on change.



Example: Drawing Release

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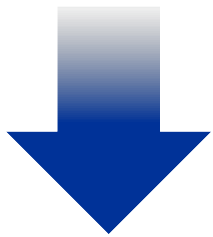


Result – Common Data Model

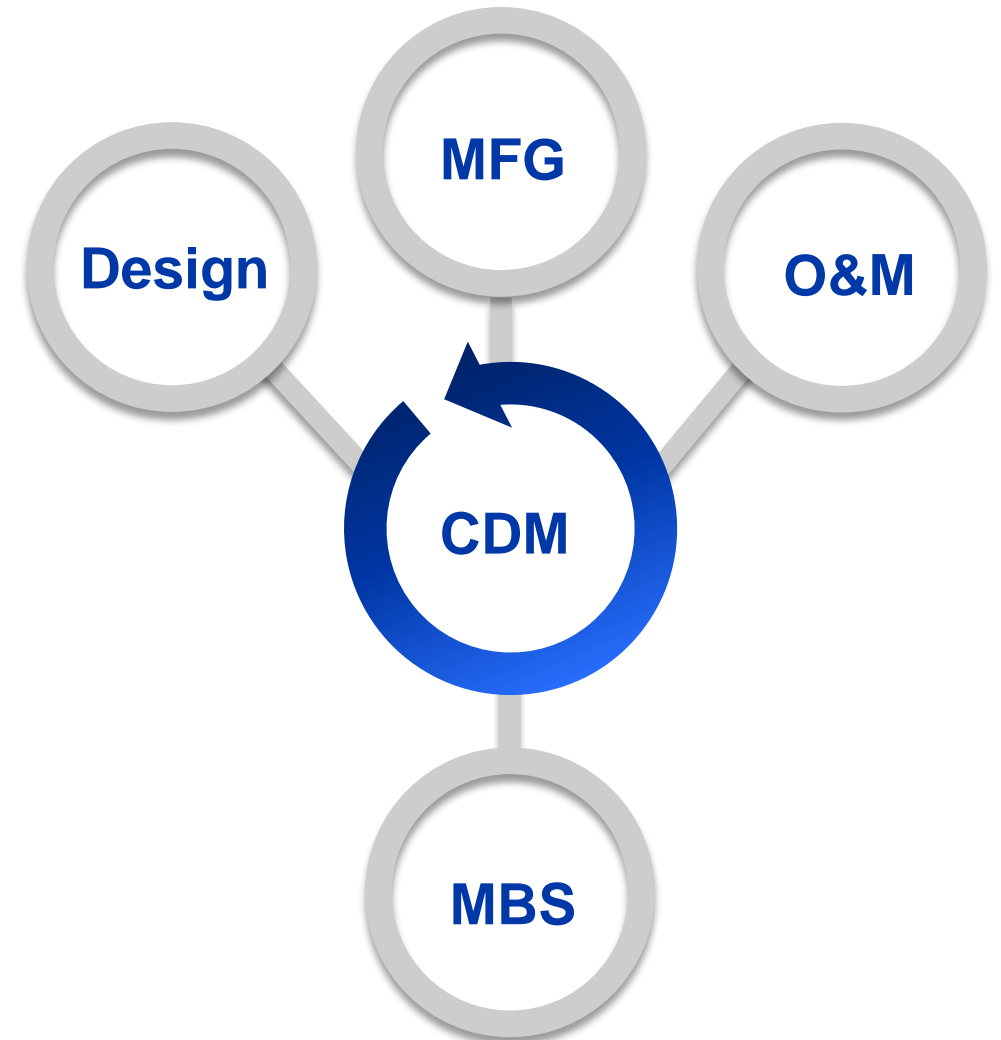
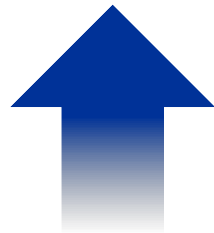
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- Integrate multiple data sources
- Enable Common Data Model (CDM)
- Increase data integrity and reuse
- Change Management Visibility
- Distributed Analysis and Result

Labor



Response



Conclusion

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- Model Based, Data Driven and Centralized
- Strong foundational definition of the digital thread for Sustainment
- Improve quality by avoiding duplicate efforts
- Reduce labor, Increase response
- Promote greater data reuse and analysis collaboration
- Proactive approach to mitigate unknown design constraint effects
- Higher visibility of causality to operations & maintenance gaps