



**DMDII 15-11-08:**

# Capturing Product Behavioral and Contextual Characteristics through a Model-Based Feature Information Network (MFIN)

*Project Members:*



**Rolls-Royce®**

**GRANTA**  
MATERIAL INTELLIGENCE



CAPVIDIA



TechAzul

**MSC Software®**

**SIEMENS**  
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**LOCKHEED MARTIN**

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MATERIAL INTELLIGENCE



ptc



MSC Software

**SIEMENS**

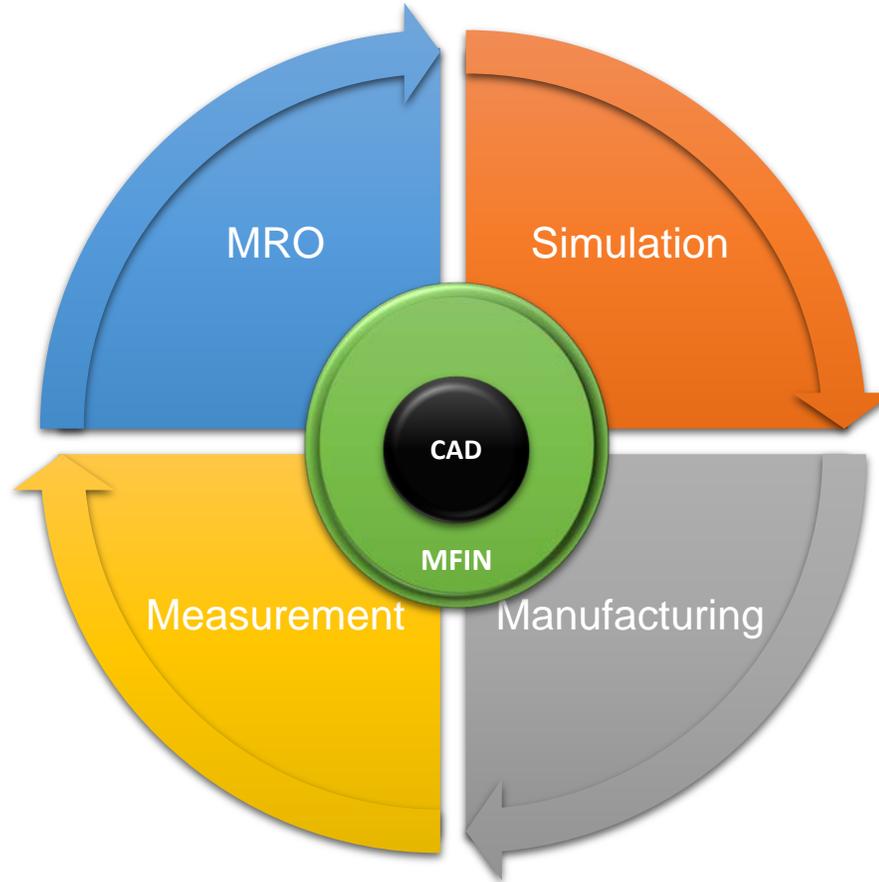


TechAzul



**Rolls-Royce**

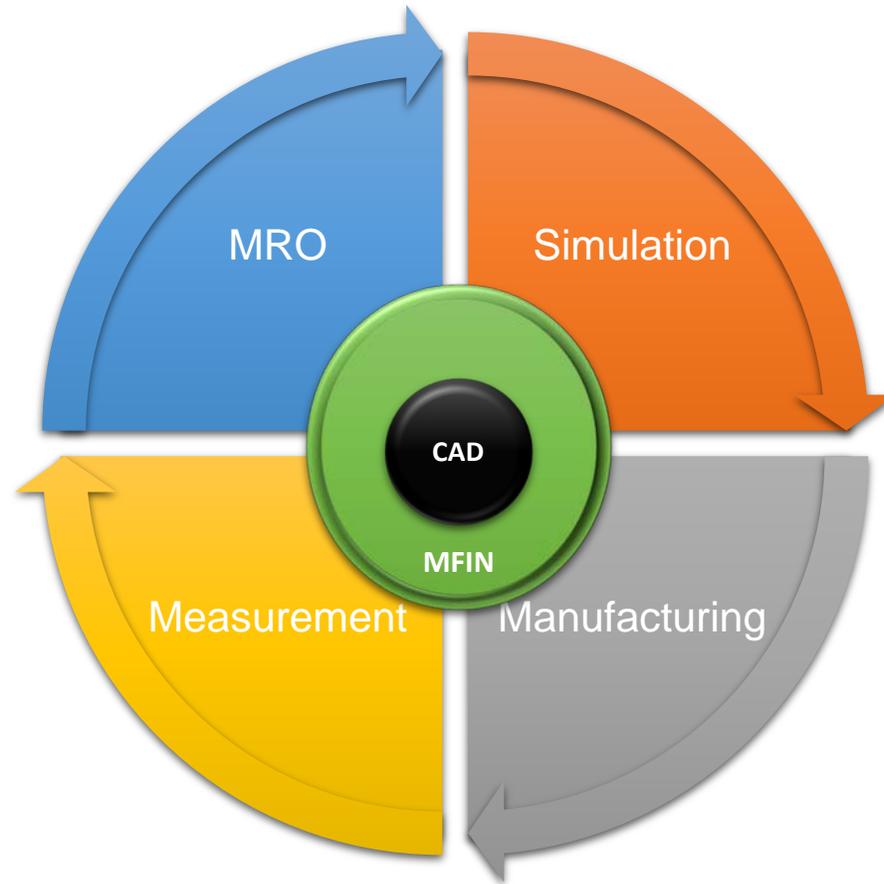
# Project Objective



Model-Based Enterprise Summit 2018  
NIST, Gaithersburg, MD, USA  
April 2-5, 2018



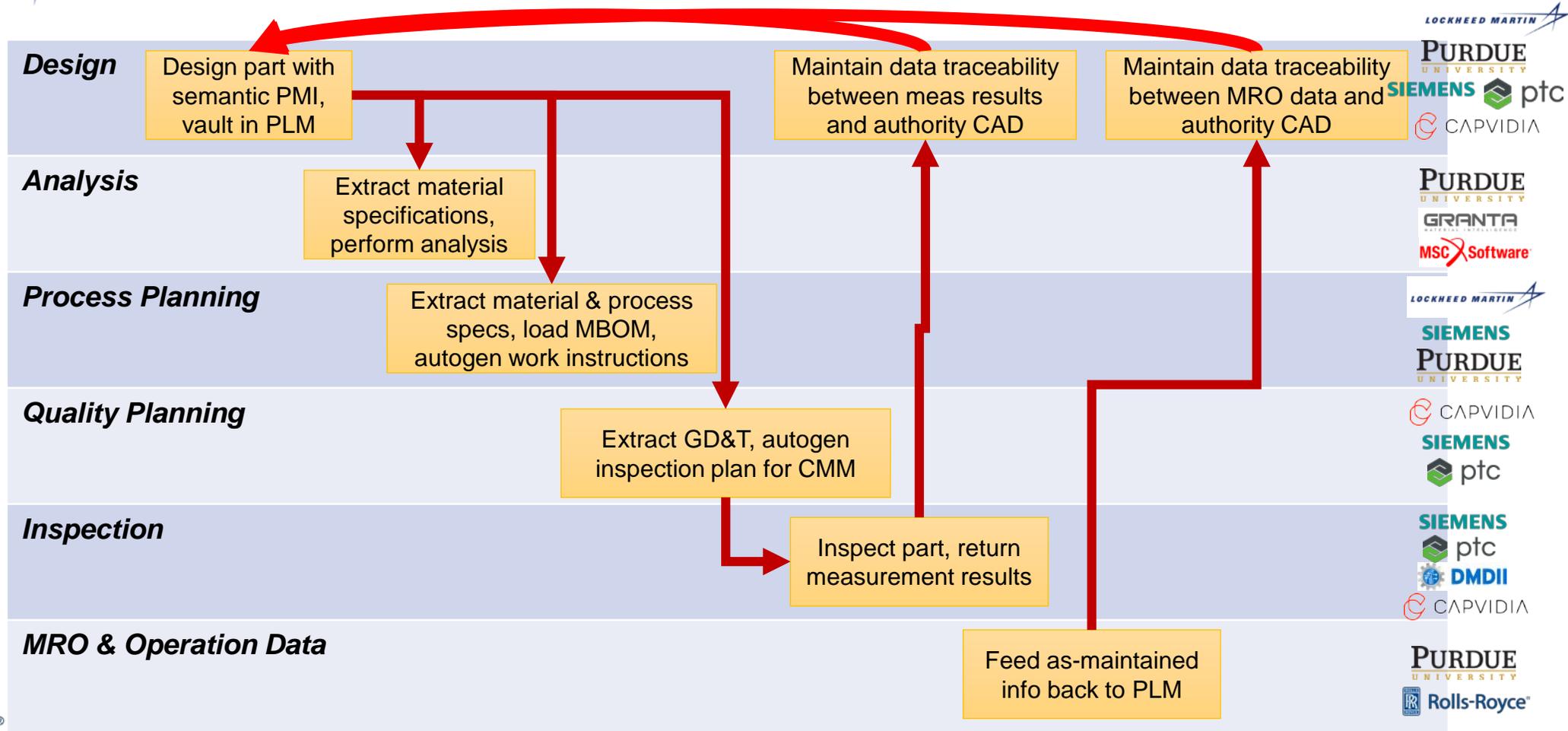
# Project Objective



## MFIN Demonstrator

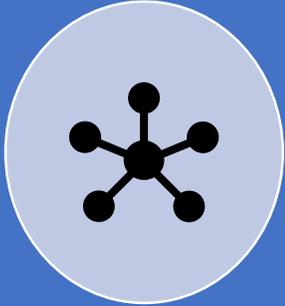
1. Run a FE simulation on the model. Simulation should be started with CAD model and materials data from MFIN as inputs. Simulation results should be stored in MFIN
2. Automatically generate machining process plan from the CAD and PMI data. The process plan is stored in the MFIN
3. CMM measurement plan is automatically created from the CAD, PMI, and knowledge of available CMM equipment. The CMM measurement plan is stored in the MFIN. CMM program is executed, and measurement results are stored in MFIN.
4. MRO data is received, and the user associates this data with the appropriate feature on the model. This connects the MRO data with the MFIN and authority CAD model.
5. Now that we have run from beginning to end, we navigate and browse all MFIN data from steps 1-4. We show how all of this data is associated with the model, and is also cross-correlated.

# 15-11 Swimlanes





# MFIN Data Model



Maintains mapping between Authority Model and downstream data



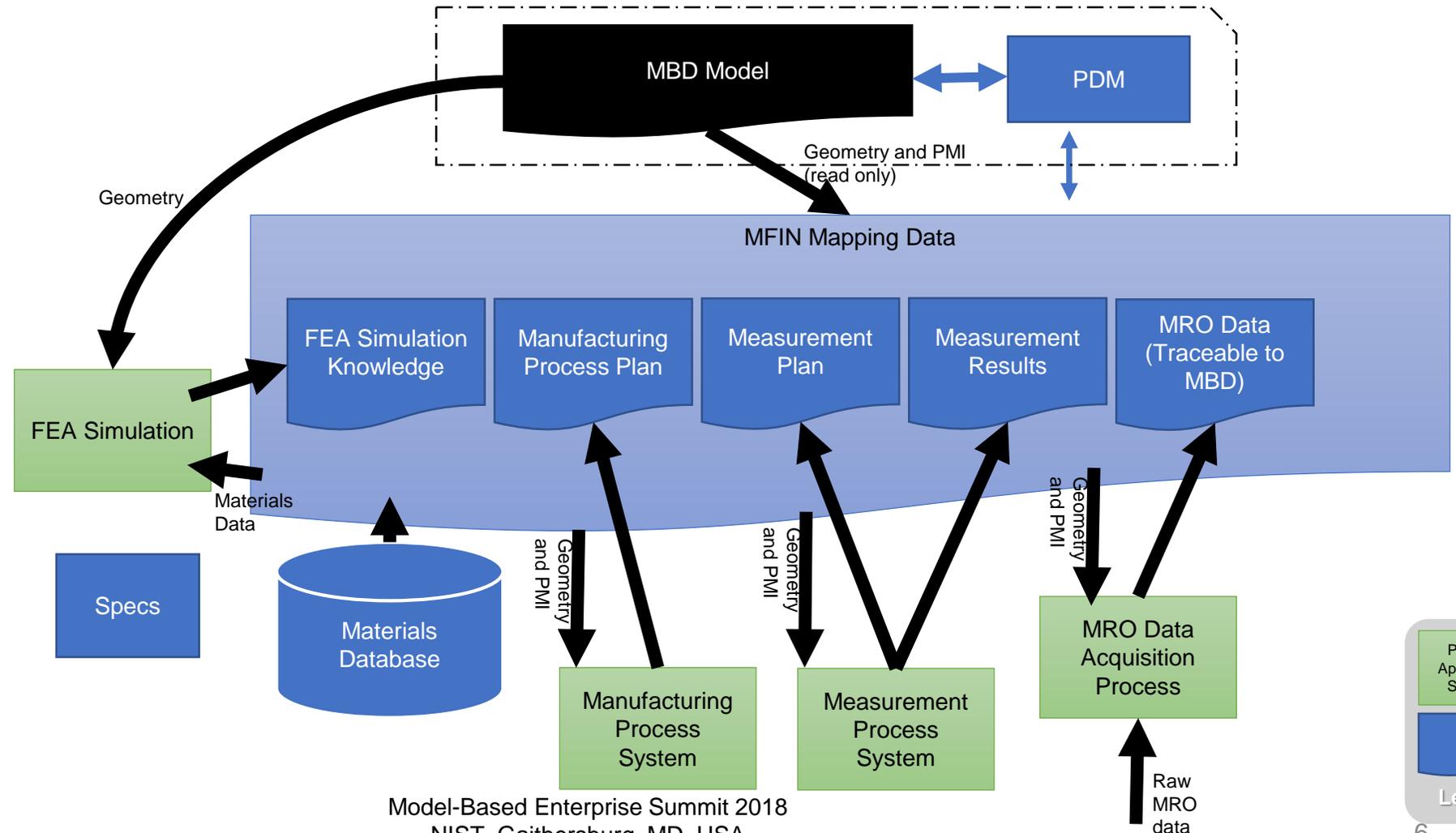
Powered by a Feature-Based conceptualization of the model



Uses QIF as a base, extending as necessary for analysis and process planning



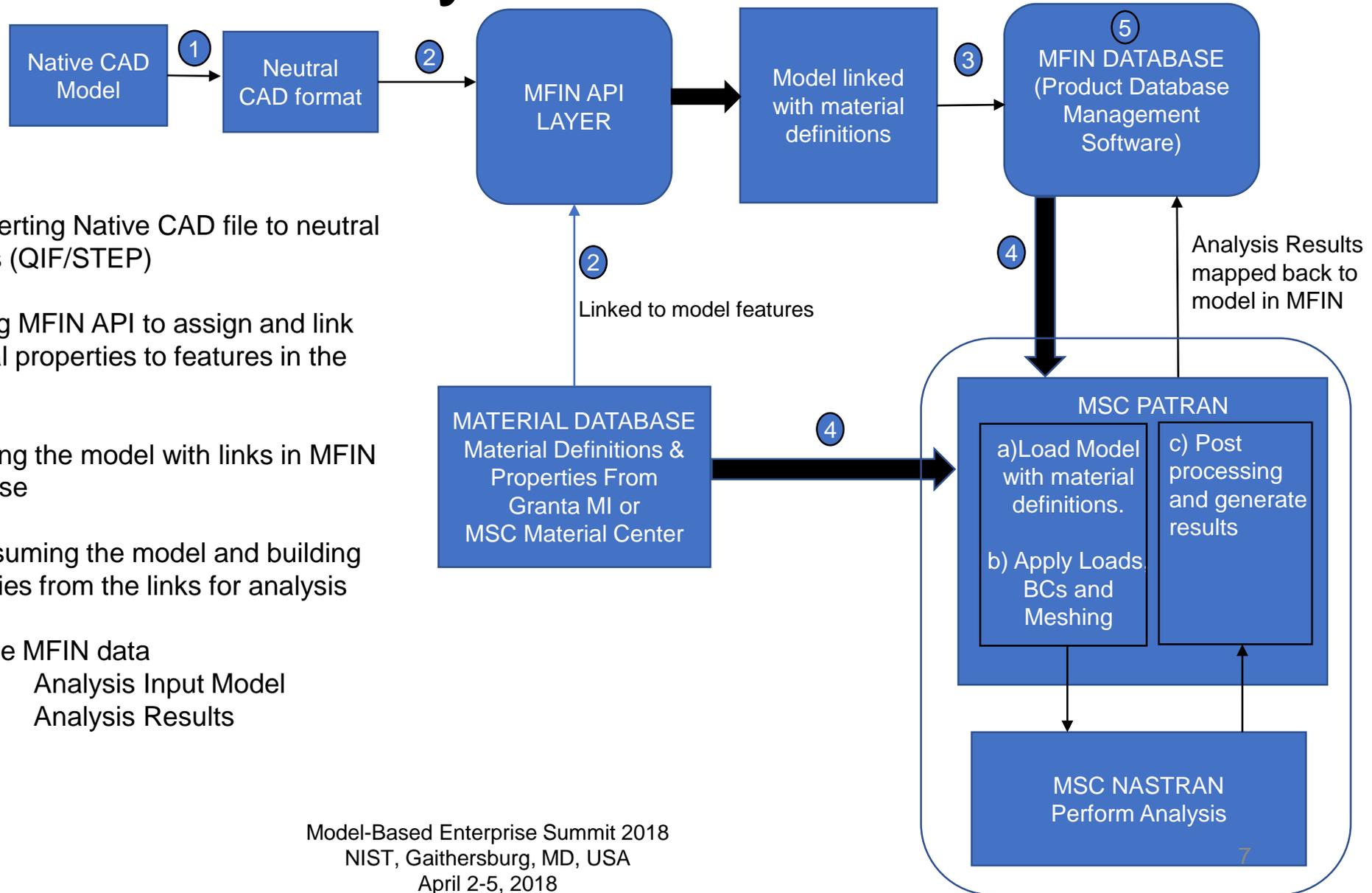
# MFIN Data Model



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# Analysis Workflow



1. Converting Native CAD file to neutral formats (QIF/STEP)

2. Using MFIN API to assign and link material properties to features in the model

3. Storing the model with links in MFIN Database

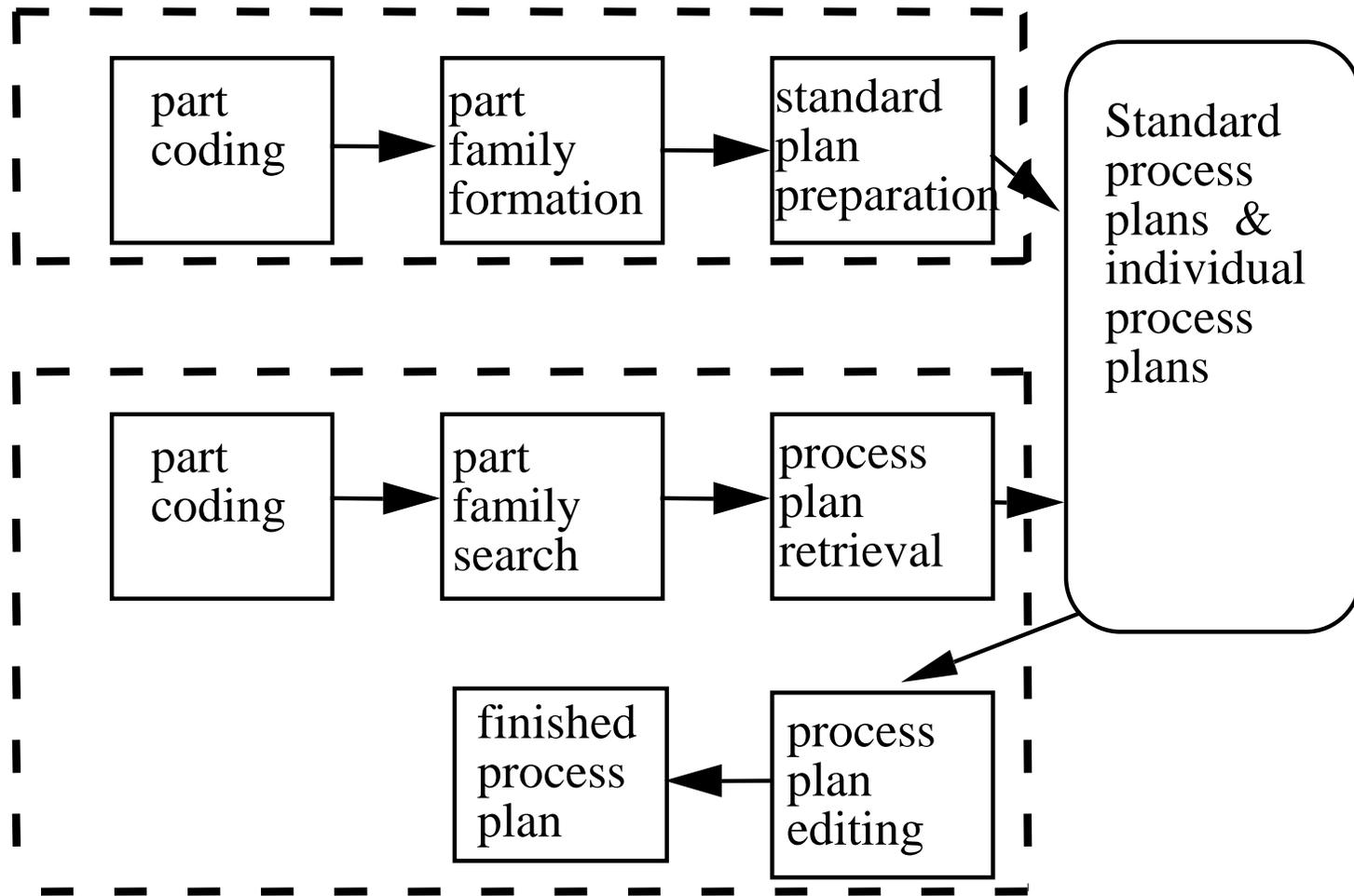
4. Consuming the model and building properties from the links for analysis

5. Create MFIN data

- Analysis Input Model
- Analysis Results



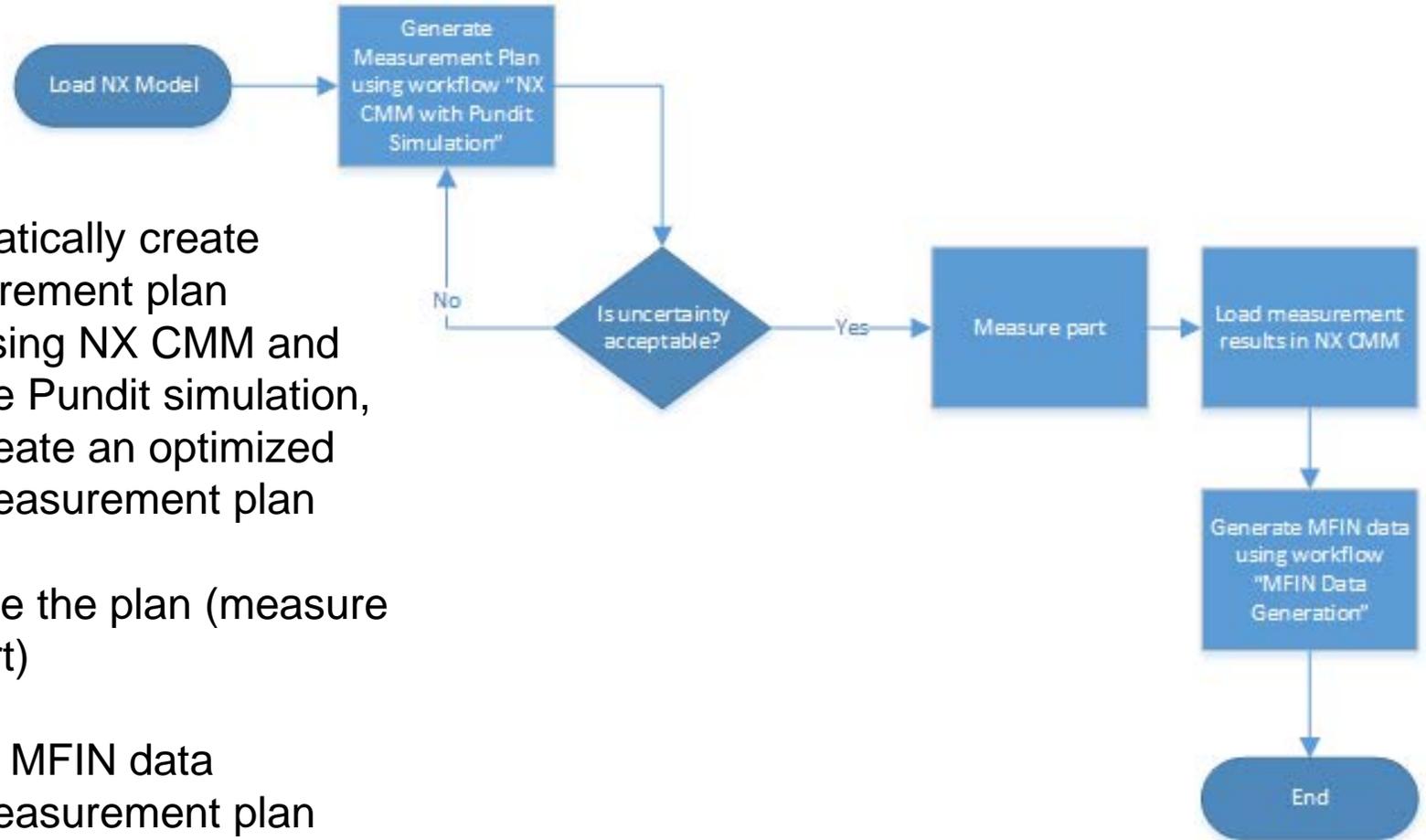
# Process Planning Workflow





# Measurement Workflow

1. Automatically create measurement plan
  - Using NX CMM and the Pundit simulation, create an optimized measurement plan
2. Execute the plan (measure the part)
3. Create MFIN data
  - Measurement plan
  - Measurement results







# Thanks!

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