



Component Manufacturing Solutions

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Topics

- ▶ Objectives
- ▶ Workflow
- ▶ Demonstration
- ▶ Benefits

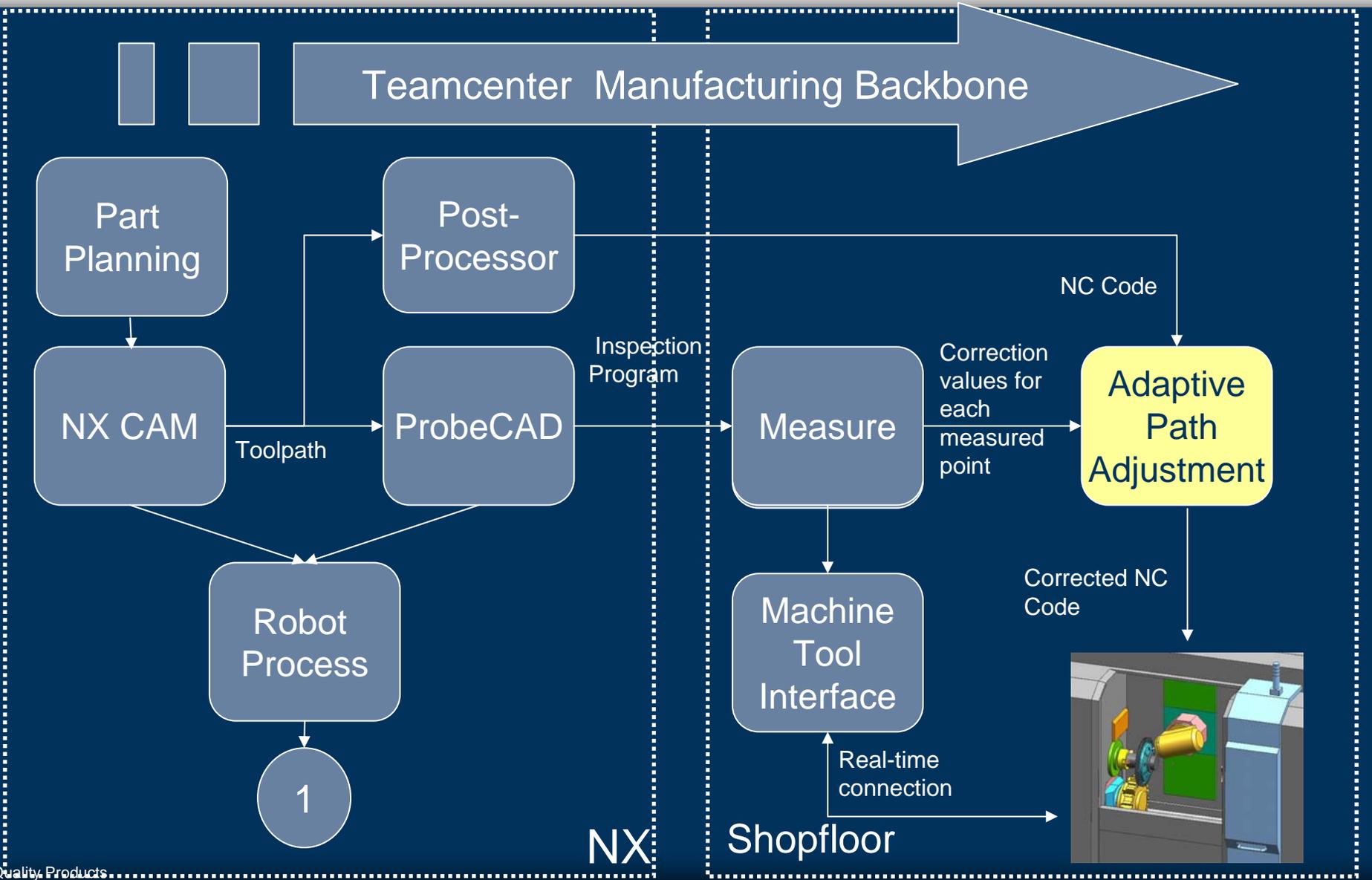


Objectives

- ▶ Demonstrate the integration of CMS products for manufacturing solutions
- ▶ Demonstrate an adaptive frame work for machining
- ▶ Built using out of the box CMS products
 - ▶ Teamcenter – Management Environment
 - ▶ Part Planning - Process Plan
 - ▶ NXCAM – Feature processing & tool path generation
 - ▶ ProbeCAD – On-machine probing
 - ▶ Measure – Adaptive Correction
 - ▶ Machine Kits – Simulation
 - ▶ Robcad – Robotic Machining

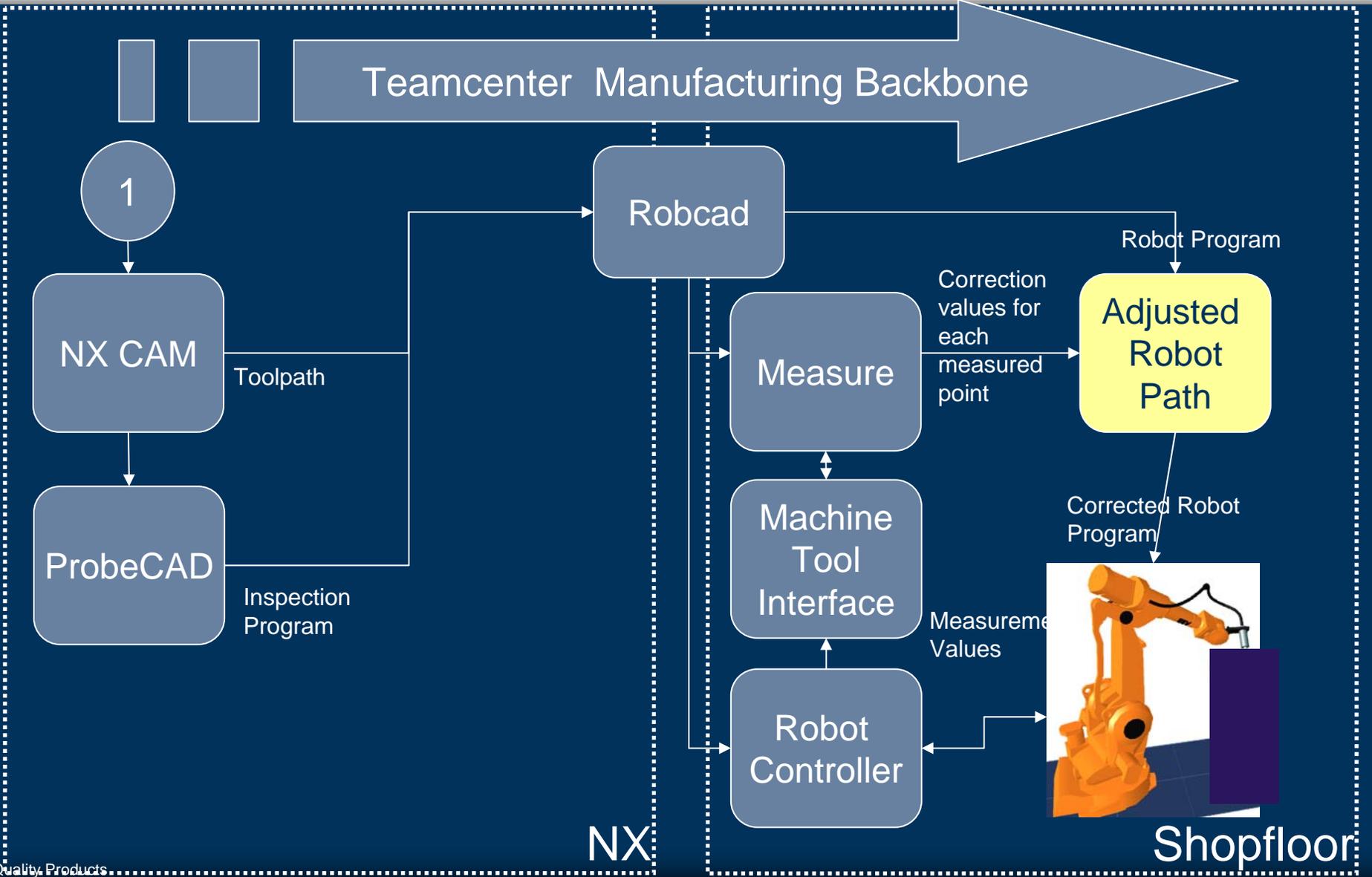


Work Flow Framework for Adaptive Machining





Framework for Adaptive Machining





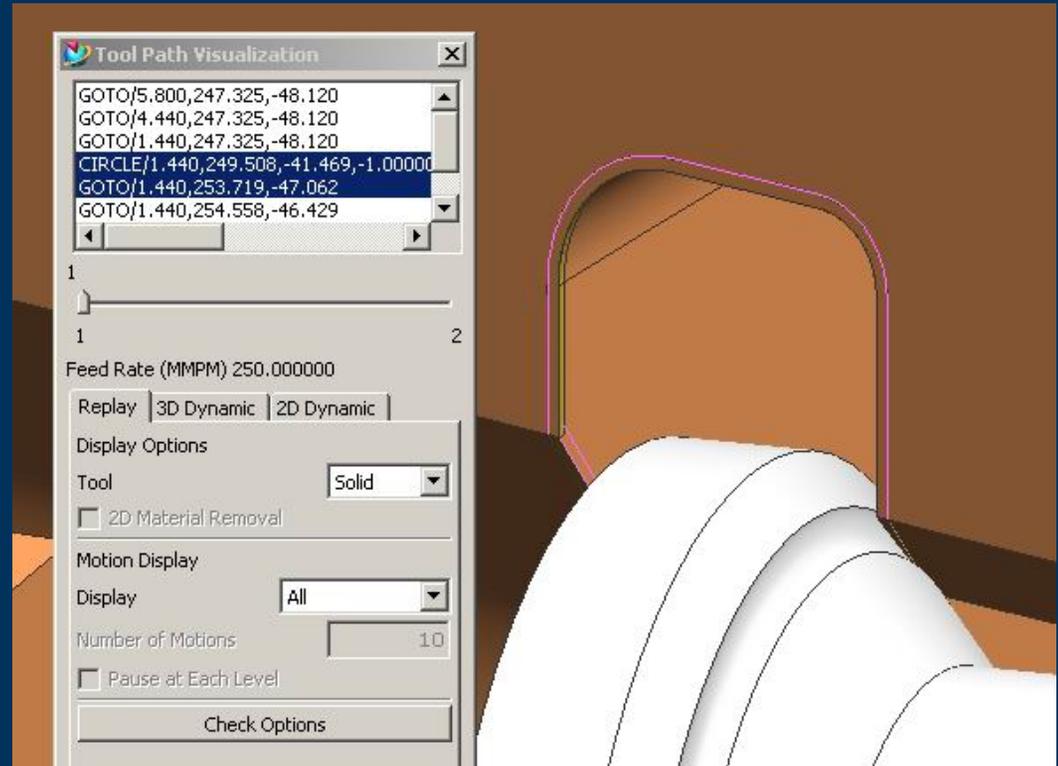
Selected Part

- ▶ Topology
 - ▶ Surface
 - ▶ Chamfers
- ▶ Features
 - ▶ Hole
 - ▶ Air holes
 - ▶ Slots



Tools

- ▶ Chamfer Tools
- ▶ Profiling Tools
- ▶ Milling Tools
- ▶ User Defined Tools





Processors

- ▶ Feature Hole Making
- ▶ Variable Axis Profiling
- ▶ Variable Axis Surface Contour
 - ▶ Drive Curve
- ▶ CL Files



Tool Paths

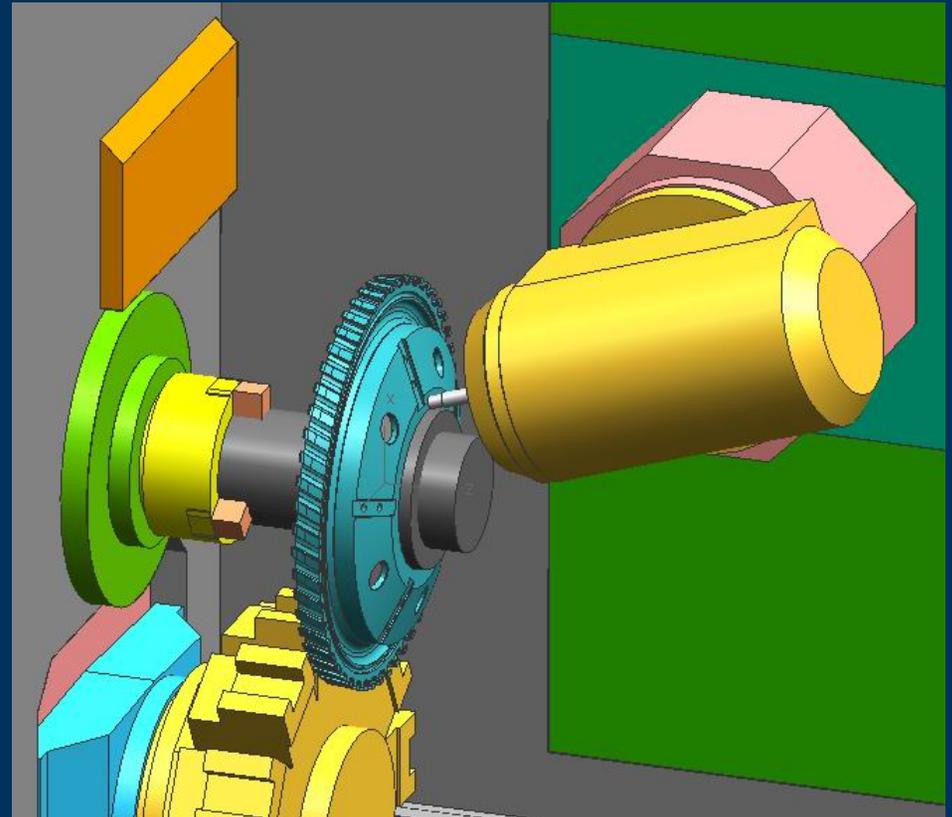
- ▶ Hole Making
- ▶ Hole Milling
- ▶ Back Milling
- ▶ Front Slot
- ▶ Rear Slot





Post Processing & Machine Kits

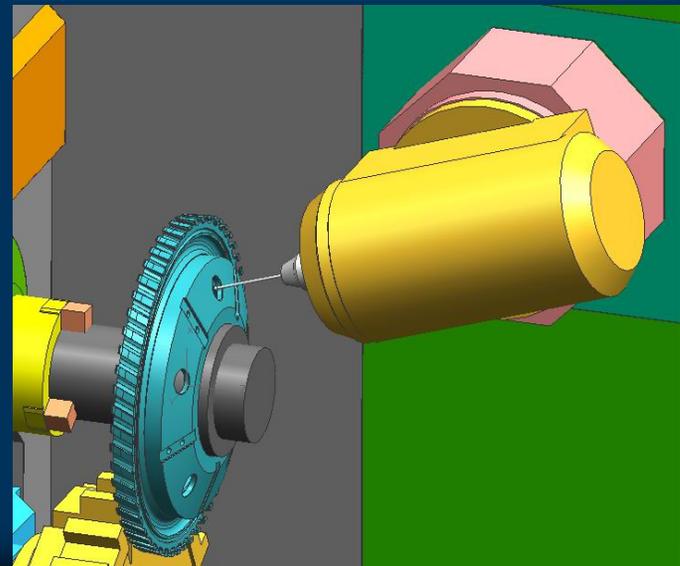
- ▶ Machine Tool Model
- ▶ Machine Kinematics
- ▶ Tooling
- ▶ Post Processing





Probing Strategy

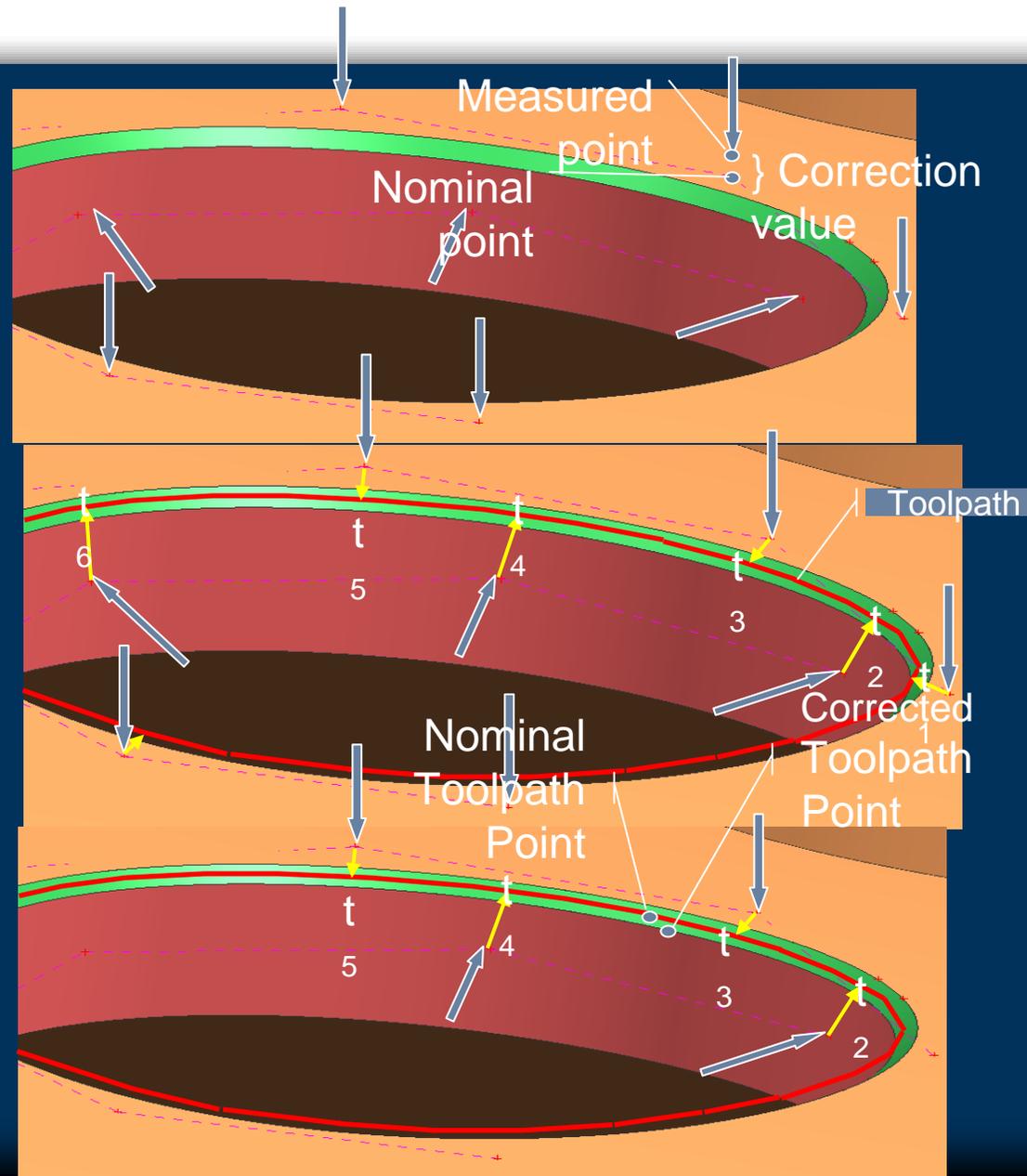
- ▶ Probe feature with ProbeCAD in NX
- ▶ Using data from CAD Model
- ▶ Use Toolpath from NX to derive curve
- ▶ Compare nominal to actual points
- ▶ Adjust Path based on deviation





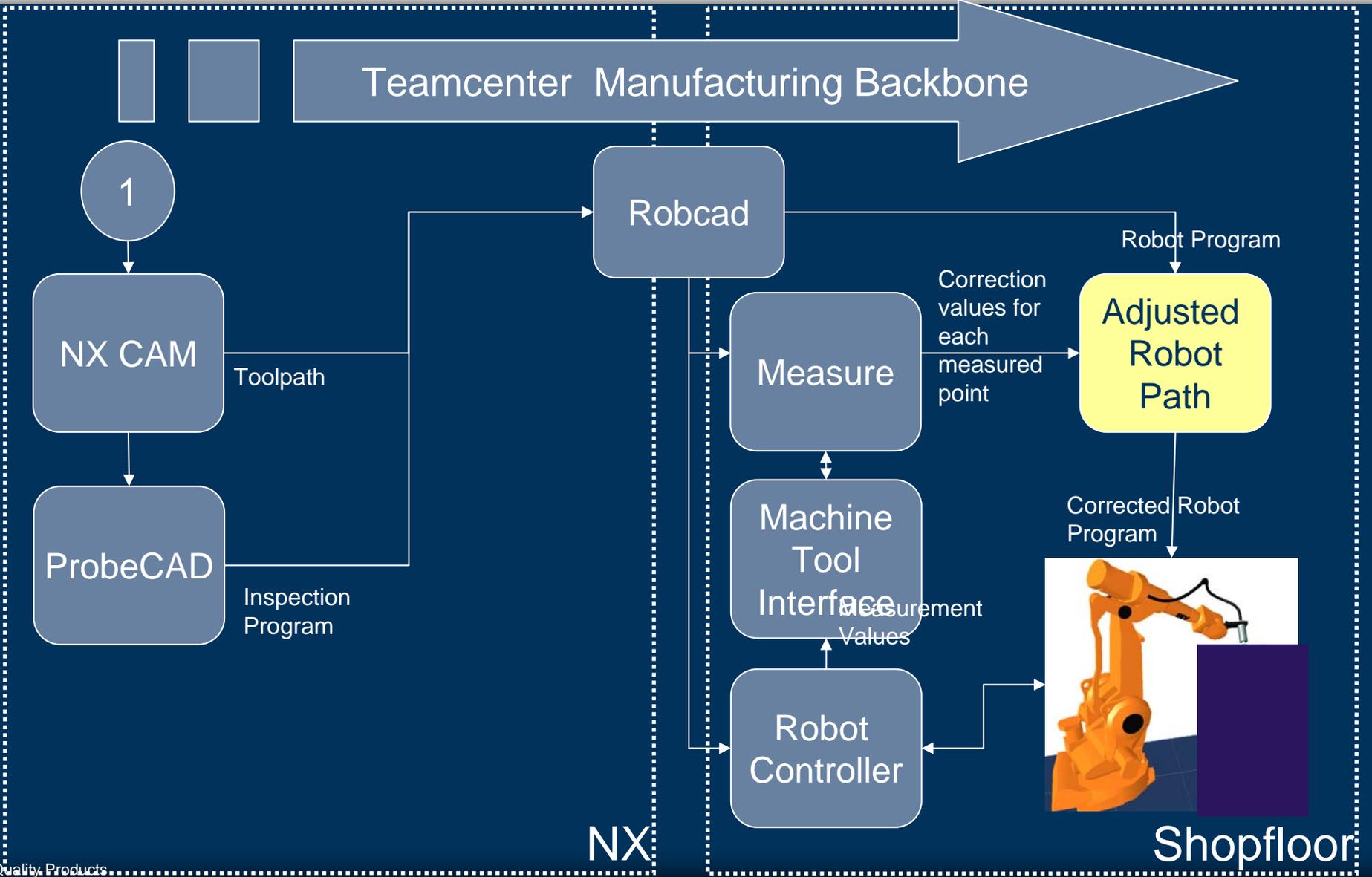
Path Adjustment Process

- ▶ Points & Correction values
- ▶ Projecting Probing Point on toolpath
- ▶ Correcting path surfaces from points





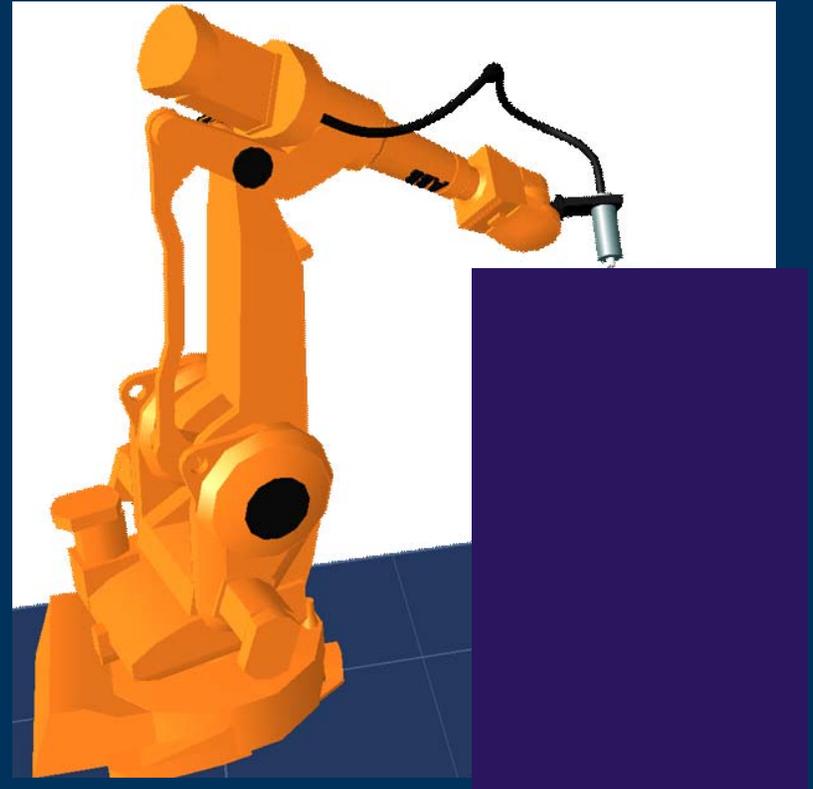
Framework for Adaptive Machining





Robotics

- ▶ Read NXCAM Tool Path
- ▶ Filter the paths
- ▶ Create refined path with vector info along the path
- ▶ Generate nominal robotic path
- ▶ Adjust path for collision avoidance and accessibility





CMS Benefits

- ▶ Framework Process can be used in multiple adaptive applications
- ▶ Framework is under a Teamcenter environment
- ▶ Customized coded reduced to a minimum
- ▶ Demonstrates the power of the integrated UGS applications
- ▶ Demonstrates varied use of machine tools and robots for precision applications
- ▶ Basic applications are out –of –the -box



Thank you