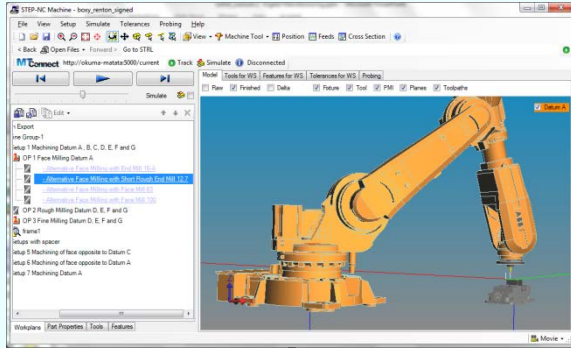
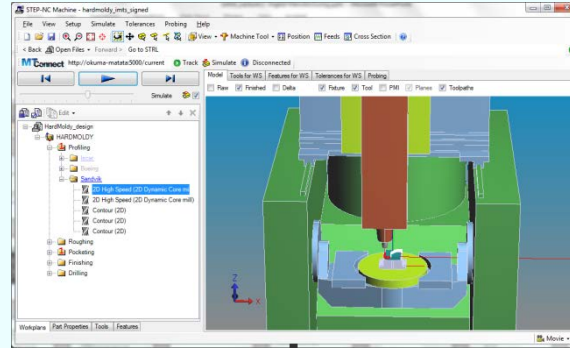


ISO JWG 15 Digital Manufacturing scope

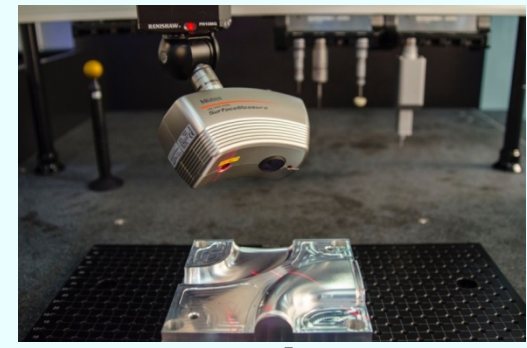
Digital Control



Digital Planning

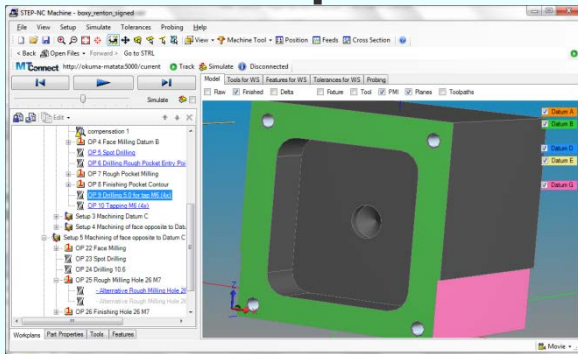


Digital Metrology

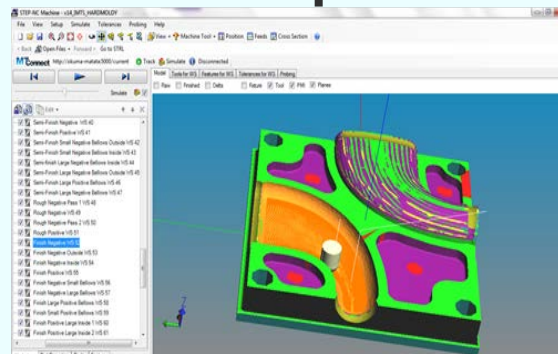


Adaptive manufacturing bus (+15% efficiency)

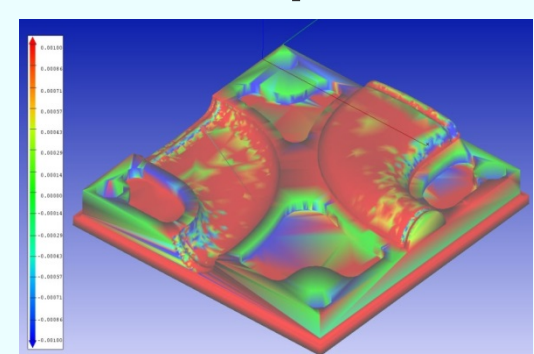
Digital Assembly



Digital Monitoring



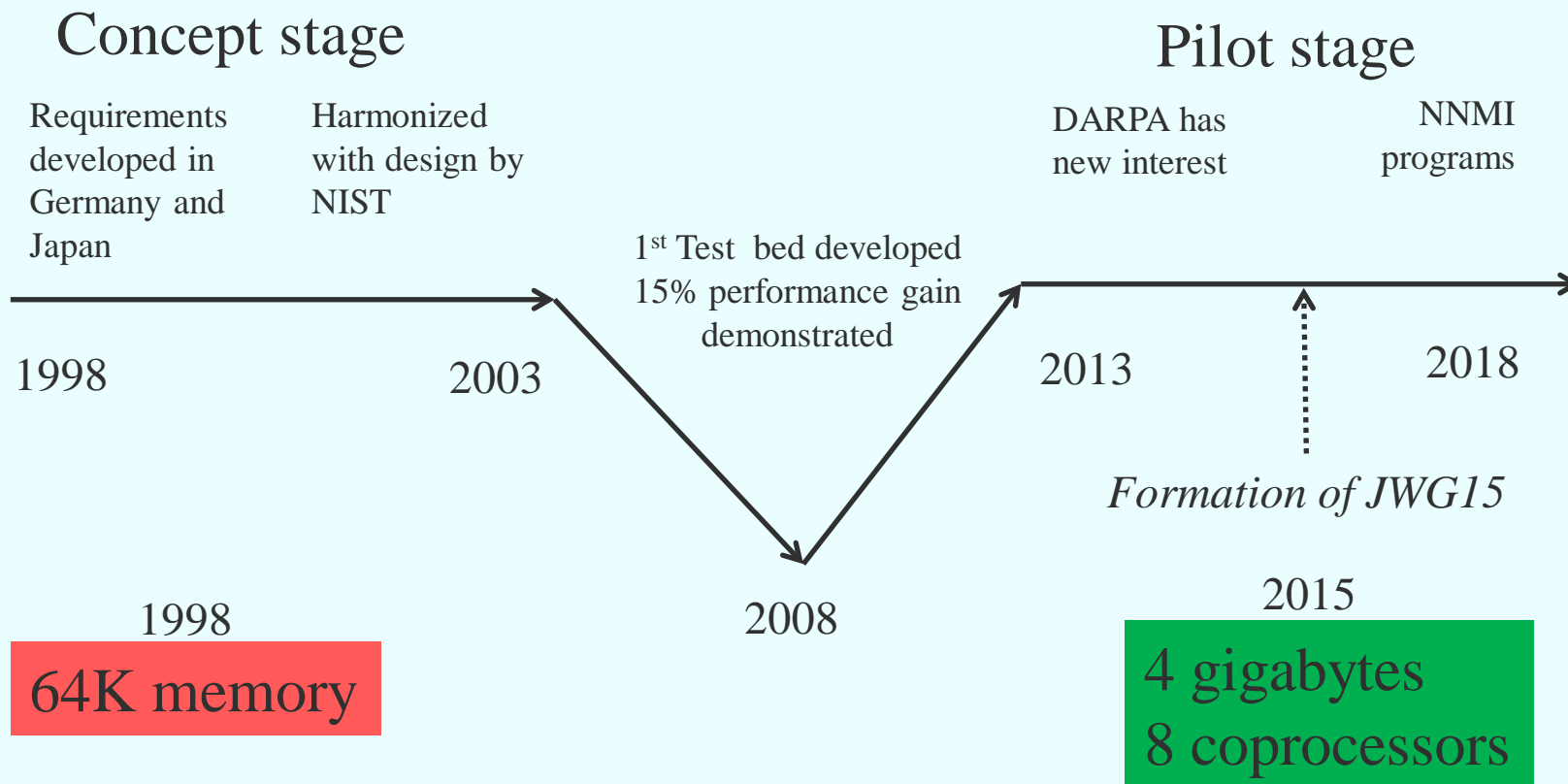
Digital Inspection



Semantic manufacturing of the semantic design

Digital Manufacturing history

During this time **CNC** machines have **grown**

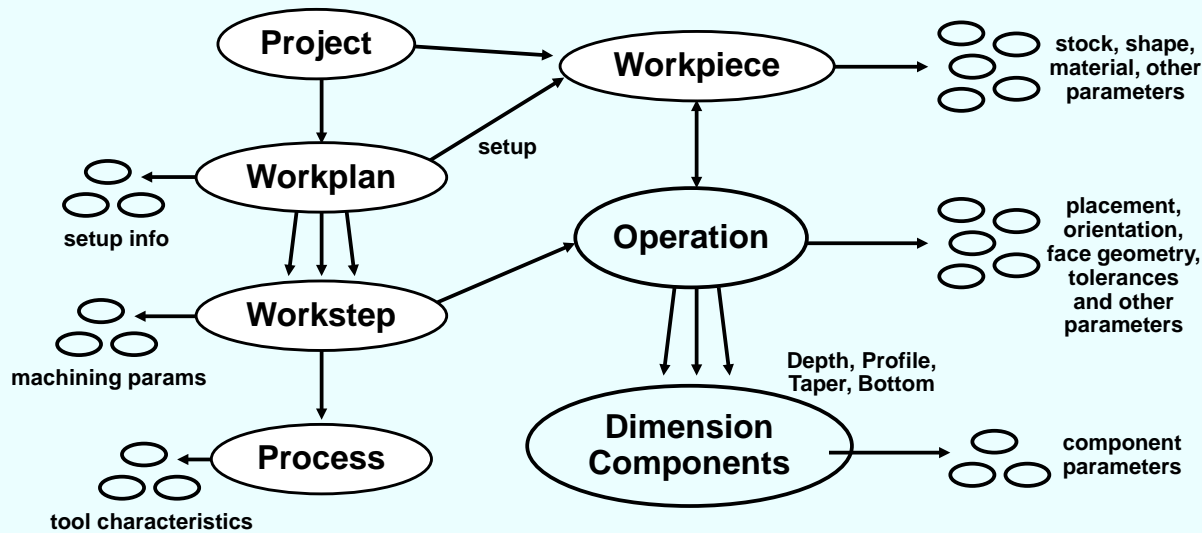


Pilots machine, monitor, inspect and assemble digital products to validate definitions and benefits

Digital Manufacturing testbed



Many functions organized into a few objects



Extensive object orientation with functions distributed between objects as appropriate

Need to open the source

Known desirable enhancements (as of 10/21/15)

- **Documented**

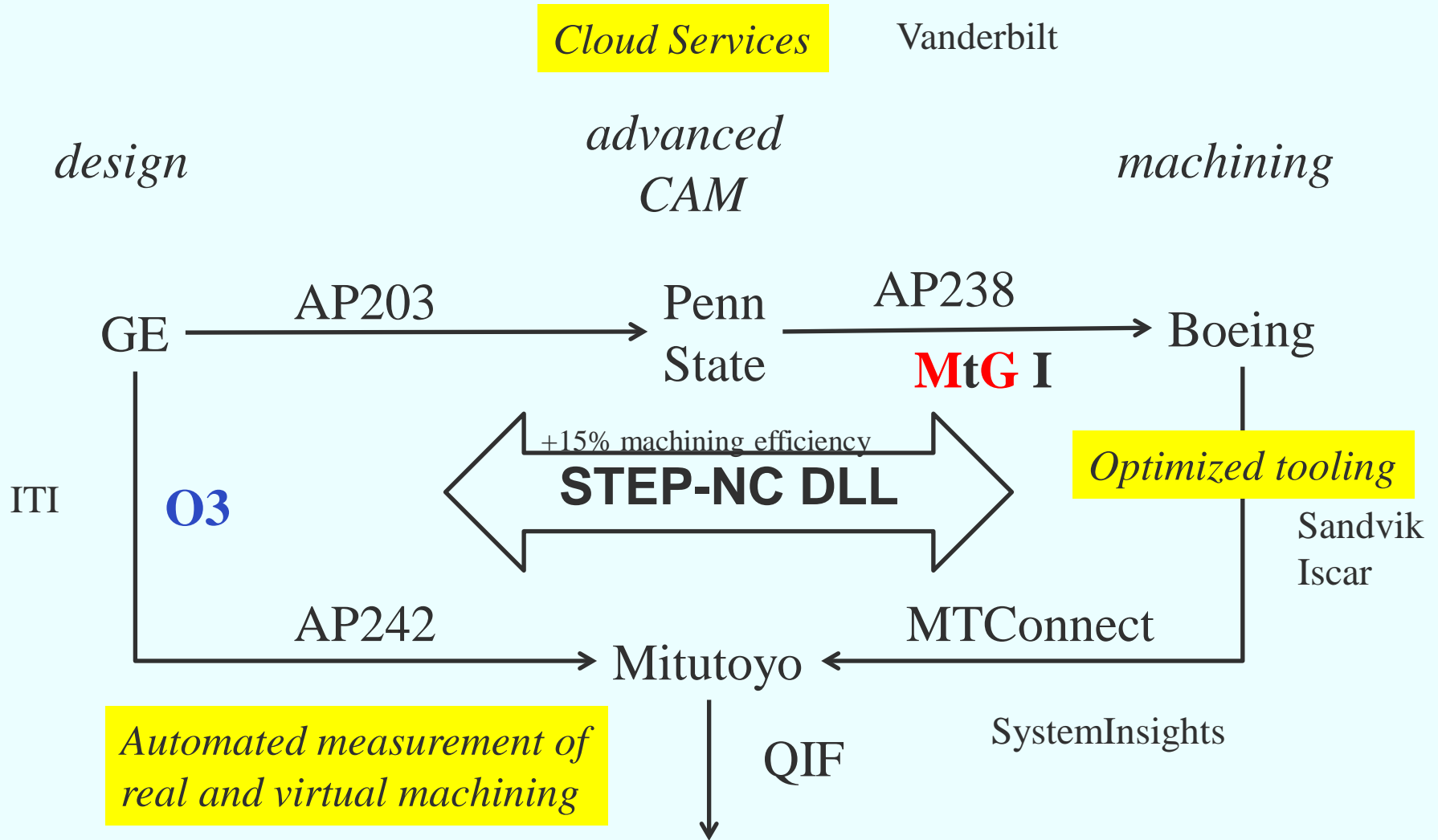
- Toolpath Reference Direction
- Toolpath placement on Workplan
- Enable/Disable Executable
- Via points for better High-Speed Machining support.
- Cross section parameters for Feed Speed optimization.
- Touch_probe as a real tool.
- Presentations associated to a workpiece
- Full workpieces for In-process geometry
- Improved AP242 compatibility

- **Not yet fully documented**

- APQP quality assurance requirements
 - » key characteristics
 - » risk analysis
- **ISO 13399 tooling harmonization**
- **Spindle characteristics**
- Conditional workplans for available tooling and other testable characteristics
- **Machine kinematics**
 - » **Including key reference points for gauge and fixture**

4D Facets for process simulation

DMDII Projects



MtG I: DMDII 14-02-02

O3: DMDII 14-06-05

RPI experiment

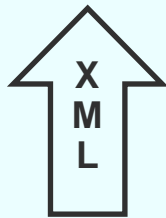
<https://github.com/ghemingway/cad.js/>

- ❑ Digital manufacturing web server
 - Upload models of product and process
 - Simulate machining
 - Reverse engineer the part

3D Models from CAD

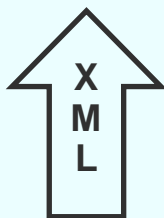
Digital Manufacturing Server

MTCConnect data streams from industry



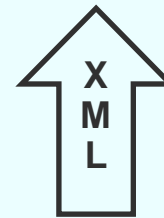
Machine

Watervliet



Machine

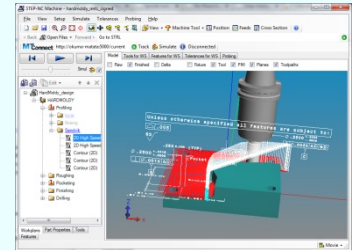
A.N.Other Inc.



Machine

RPI MILL

JSON/WebGL



Live observation

STL/AP242

Snapshot validation

