

# Virtual Manufacturing : Service offerings

- Commonality
- Engineering change management

Product design

Product Validation

- DFA/DFS/DFE
- Tool validation

- Torque selection
- Tooling selection
- Process flow sequencing

Process design

Assembly Process Planning

- Human validation
- Assembly validation
- MBOM validation

- Work instruction
- Torque & tooling lists
- Time standards
- Safety Equipment information(PPE's)

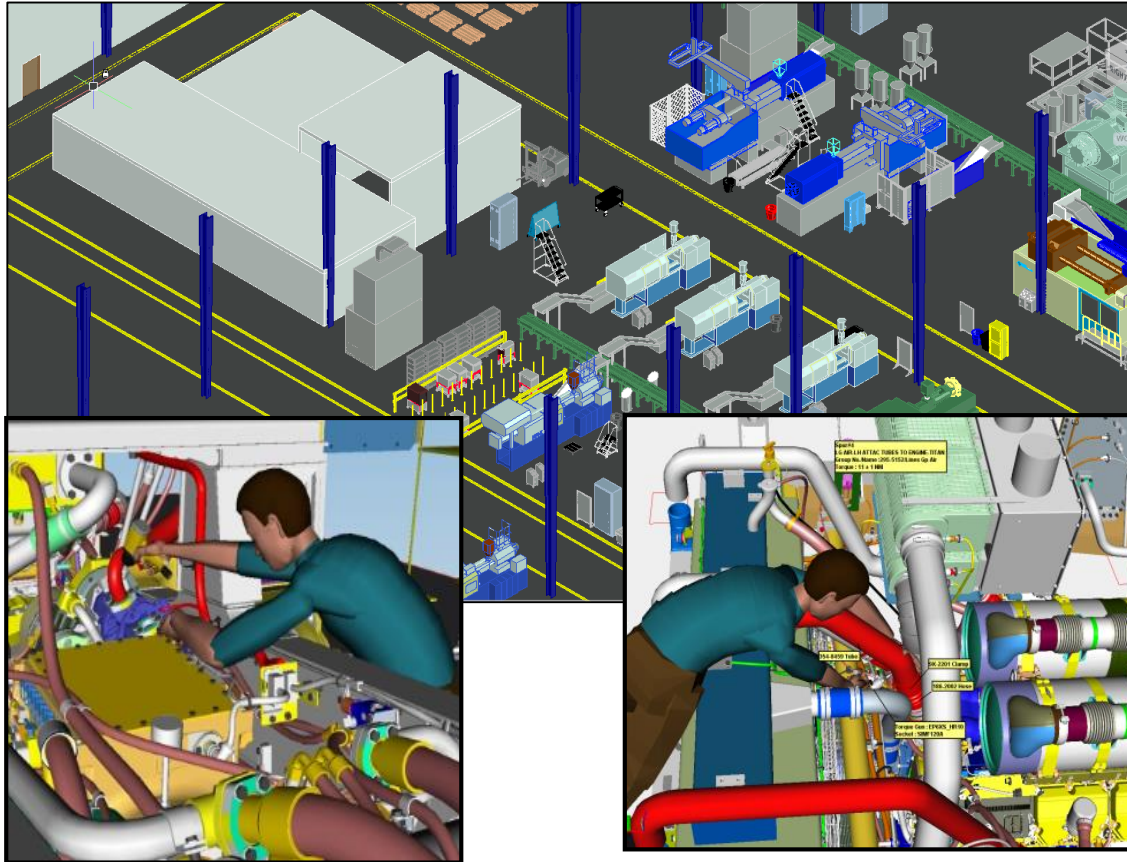
Process Validation

Process development

- Time study
- Line balancing

Standardization

# Virtual Manufacturing



## Process Validation

- Bill of Material Consumption
- Manufacturing Operation Sequence

## Tooling Validation

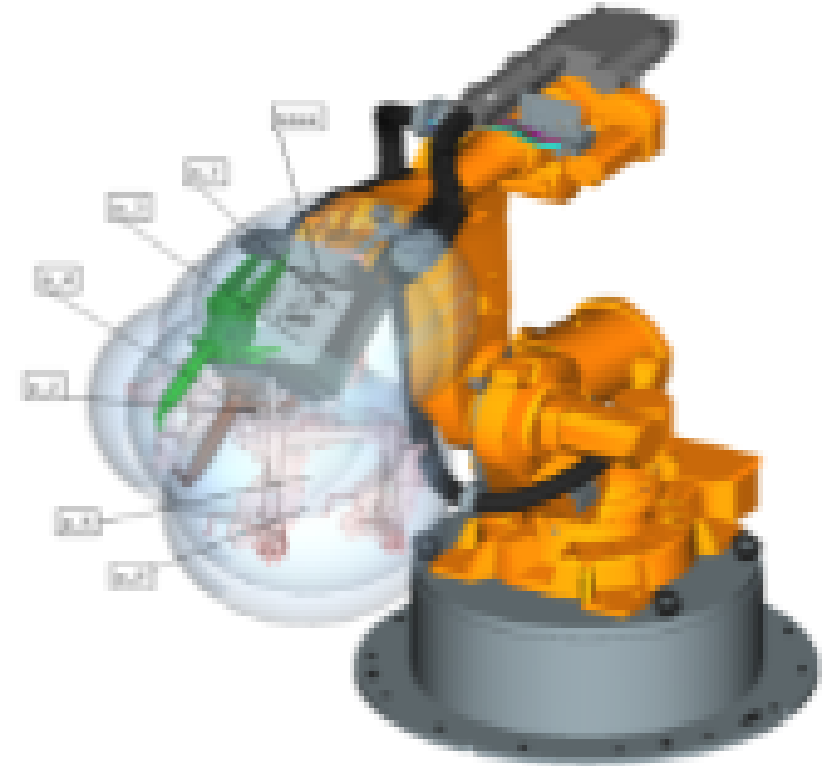
- Torque Tool Access
- Clearance & Interference
- Human Reachability and Access

## Ergonomic Validation

- Visibility
- Reachability
- Accessibility
- Safety Criteria for Fixture, Material Lifting, Torque Tooling



# Robot Simulation



Safe-Robot Evaluation

100%



Safety

3



Variants

PLC



controlled

100%



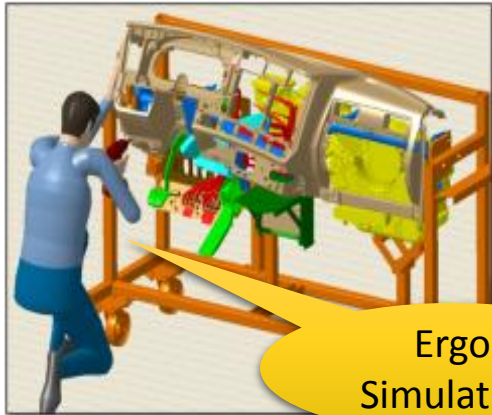
Poka-Yoke

- Virtual validation
- Multivariant flexibility for increased productivity
- Safe move technology

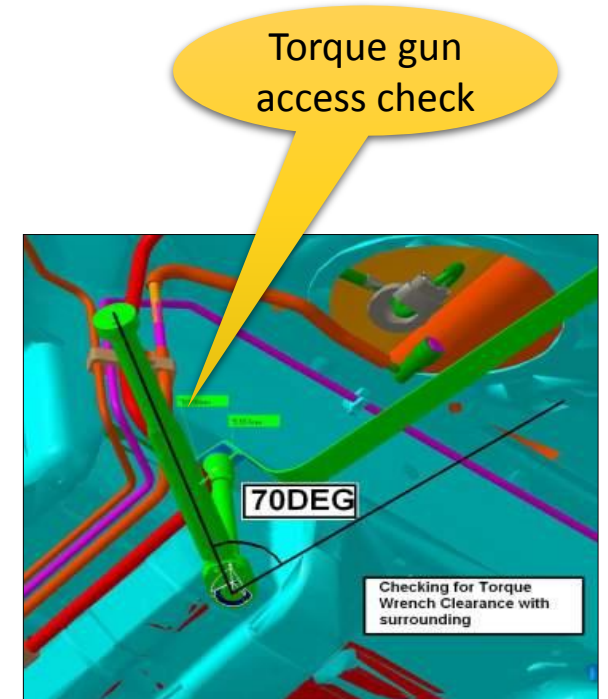
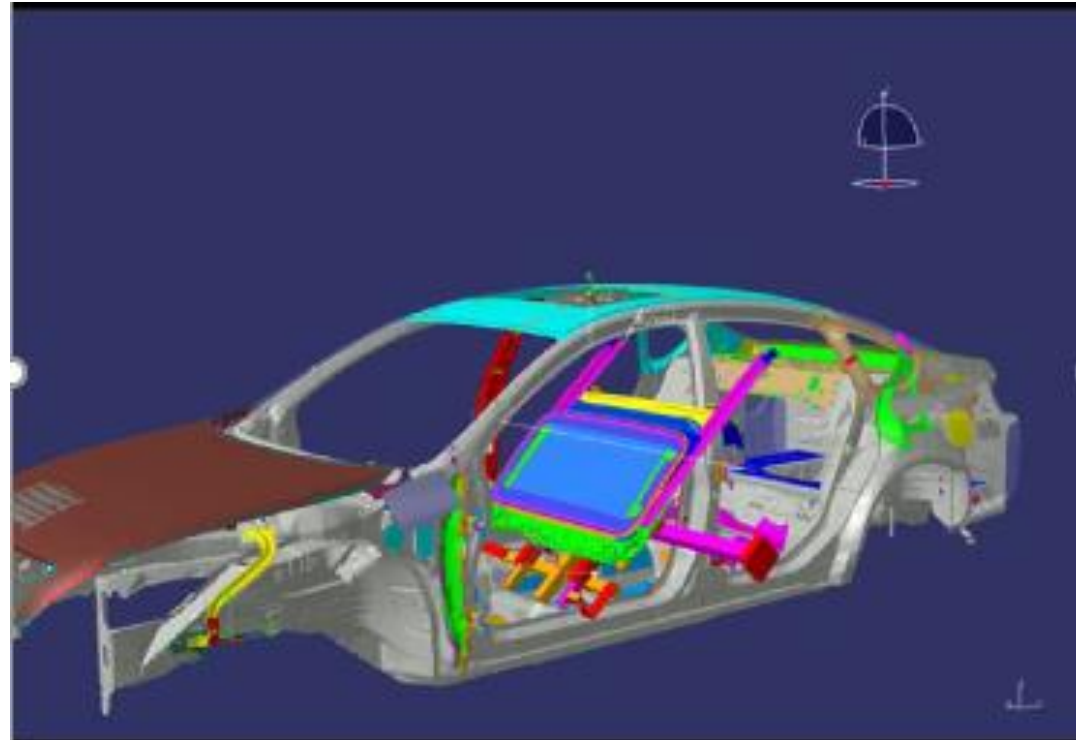
# Assembly Simulation

## Assembly Simulation

- DFA
- Product assembly validation
- Tool selection
- Hand space/Tool space check
- Assembly sequence definition



Ergo Simulation



Scope

Automotive NPI – Assembly and Ergo simulation & validation

Input

EBOM, Layout

Deliverable

Audit/validation reports, Virtual build, Assembly simulation/Visual work instruction

Software

DELMIA V5 – Assembly Process Simulation