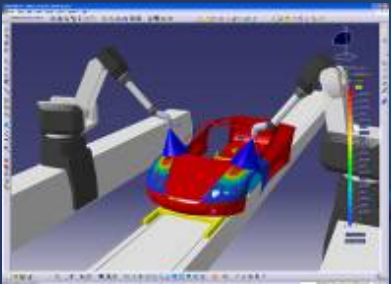


V5R18



DELMIA Overview



DELMIA - Excellence for Manufacturing Production Performance



DELMIA PLM for your Industry

Digital manufacturing solutions built for you



Your DELMIA PLM Express

Solutions for companies of all sizes



Collaborative PLM

Leveraging knowledge and expertise across your enterprise

Breakthrough technologies

Helping you gain productivity



Easy, Open, and Scalable

Adaptable to you

DELMIA PLM Express: Workcell Builder

QUICKLY BUILD ROBOTIC WORKCELLS, REUSE COMPONENTS & PERFORM ROBOTICS FEASIBILITY STUDIES

Benefits

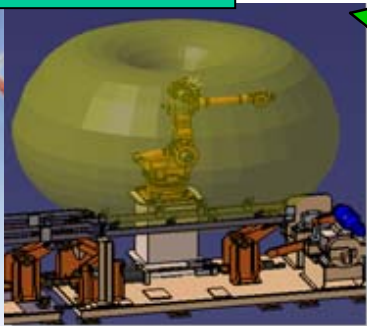
- Validate manufacturing concepts in the virtual world
- Provide manufacturing cell models to the robot programmer

Dedicated to Manufacturing Engineer/Systems Integrator

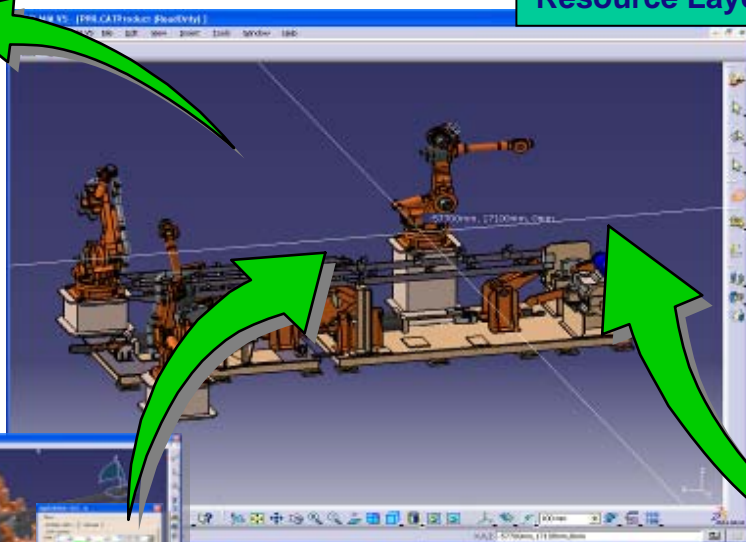
Capabilities

- Build an accurate 3D mechanical model of a new or existing manufacturing cell
- Robot feasibility/workspace analysis
- Develop new tooling designs
- Associate tools and positioning equipment with a robot
- Provide the cell model to the robot programmer for daily use
- Generate dimensional drawings to create the workcell

Robotics Studies



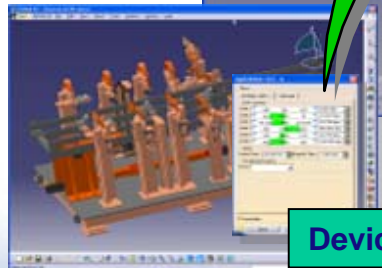
Resource Layout



Robot Library



Device Building





DELMIA PLM Express: Robot Simulation

Robotic cell set-up, validation, simulation

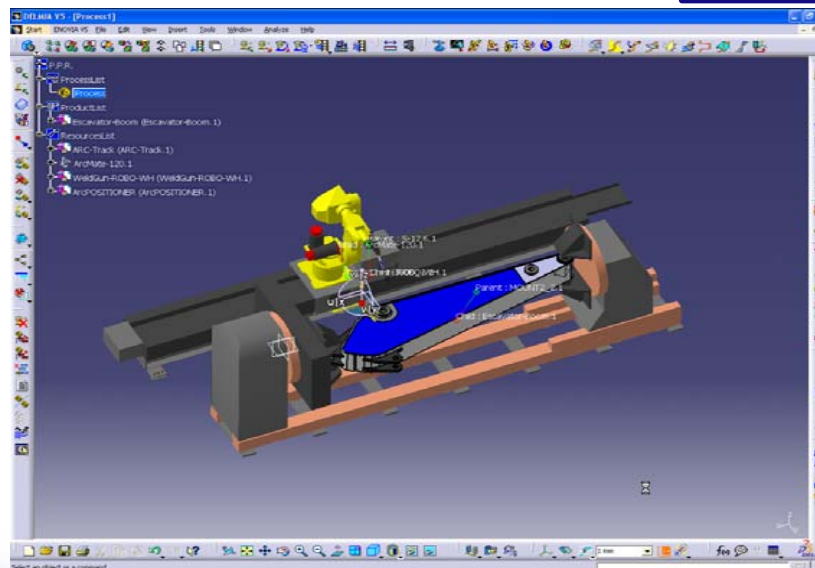
Benefits

- Create new production workcells in the virtual world
- Integrated V5 Robotics & OLP maintains link with a V5 part & geometry. Design Changes can be realized immediately
- Quality and consistency control with data shared

Dedicated to robotics programming engineer

Capabilities

- Define robot tasks
- Sequence workcell operations
- Simulate & validate sequence
- Reduce errors in communication
- V5 native application
- Fast and easy to use
- Dedicated Robotlib of your choice
- Frames the basis for robotic ARC & SPOT welding applications



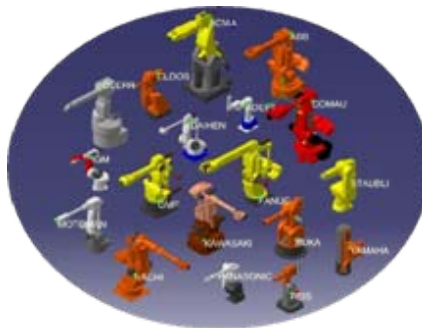
DELMIA PLM Express: V5 Arc Welding

Off-line Robot Program, simulation & download

Benefits

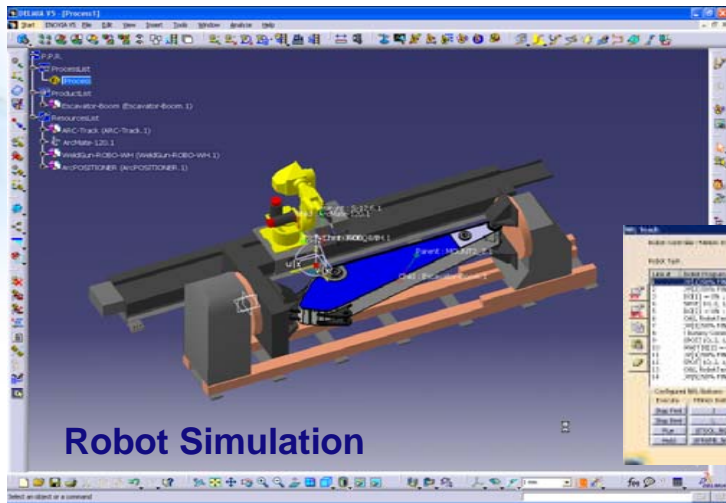
- Keep expensive real robots in production while at the same time create new production programs in the virtual world
- Store weld process parameters and robot programs in one central location, V5.
- Integrated V5 Robotics & OLP maintains link with a V5 part & geometry. Design Changes can be realized immediately
- Concurrent Engineering/Improved Communication/Cost Reduction
- Quality and consistency control

Dedicated to robotics programming engineer



Capabilities

- Reduced time to teach & program a Robot
- Reduce errors in communication
- V5 native application
- Fast and easy to use
- Dedicated Robotlib of your choice
- Upload & Download Robot programs
- Application offers a highly productive and intuitive simulation environment providing different tools to fulfill robot arc welding simulation needs



Robot Simulation

```

/PROG RobotTask
/ATTR
OWNER           = MNEDITOR;
COMMENT         = "DELMIA OFFLINE PROGRAM - Resource Id ";
CREATE          = DATE 06- 04- 21 TIME 09:54:33;
MODIFIED        = DATE 06- 04- 21 TIME 09:54:33;
VERSION         = 0;
PROTECT         = READ_WRITE;
TCD: STACK_SIZE = 0,
      TASK_PRIORITY = 50,
DEFAULT_GROUP  = 1,*,*,*,*;
CONTROL_CODE   = 00000000 00000000;
/MN

L_NUM = 3 ;
1000mm/sec FINE ;
1000mm/sec FINE SPOT[BU=C,P=20,S=1,BU=0];
1000mm/sec FINE SPOT[BU=C,P=30,S=2,BU=0];
1000mm/sec FINE SPOT[BU=C,P=10,S=1,BU=*];
1000mm/sec FINE ;

: 3,          CONFIG : 'N U T , 0, 0, -1',
83 mm, Y = 479.724 mm, Z = 737.738 mm,
1 deg, P = 0.001 deg, R = -176.875 deg

UF : 0, UT : 3,          CONFIG : 'N U T , 0, 0, -1',
X = 717.278 mm, Y = 479.725 mm, Z = 457.972 mm,
W = 0.001 deg, P = -0.001 deg, R = -176.875 deg
);
P[3]{
GP1:
UF : 0, UT : 3,          CONFIG : 'N U T , 0, 0, -1',
X = 1332.874 mm, Y = 513.333 mm, Z = 457.951 mm,
W = 0.001 deg, P = -0.002 deg, R = -176.875 deg
);
    
```



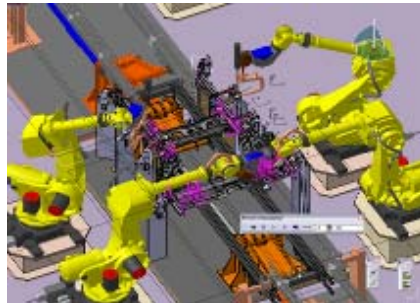
DELMIA PLM Express: SPOT Welding

Off-line Robot Program, simulation & download

Benefits

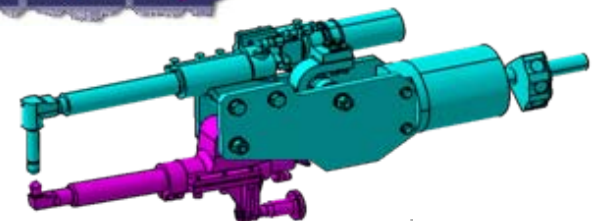
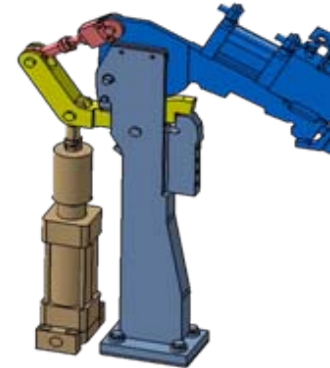
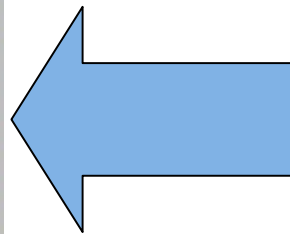
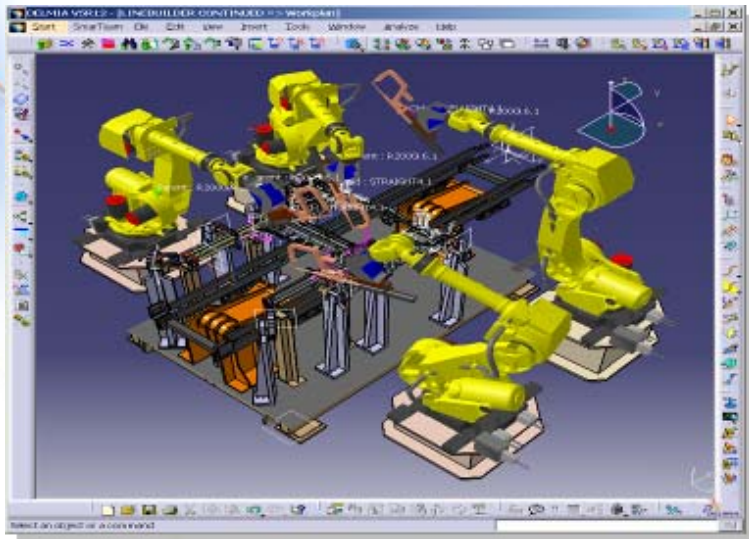
- Keep expensive real robots in production while at the same time create new production programs in the virtual world
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- Integrated V5 Robotics & OLP maintains link with a V5 part & geometry. Design Changes can be realized immediately
- Concurrent Engineering/Improved Communication/Cost Reduction
- Quality and consistency control

Dedicated to robotics programming engineer



Capabilities

- Reduced time to teach & program a Robot
- Reduce errors in communication
- V5 native application
- Fast and easy to use
- Dedicated Robotlib of your choice
- Upload & Download Robot programs
- Application offers a highly productive and intuitive simulation environment providing different tools to fulfill robot arc welding simulation needs



DELMIA PLM Express: Human Workplace Simulation

Optimize product design for better human-product interaction

Benefits

- Reduce design timeframe by introducing ergonomics earlier in the design process
- Significant process time savings
- Remove the need for costly physical prototypes and real human simulations
- Improve product quality & security
- Efficient and early assembly validation (workstation, tools, sequence, etc)



Capabilities

- Preset Manikins from 5 different population specificities
- Manikin posture definition
- Vision & accessibility analysis
- Optimize human-workplace interactions
- Manikins Simulation in the virtual 3D environment context
- Apply human attributes from existing catalogs
- Ensure tool/Hand space availability

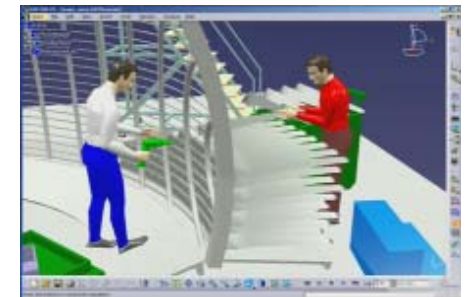
Build



Analyse



Simulate & Validate



DELMIA PLM Express: Available extension to Human Workplace Simulation

Human Work Analysis:



Human Posture Catalogs



DELMIA PLM Express

Resource Planner Robotics Ergonomics Planner Controls

Extensions Option

- DELMIA - Spot Welding Programmer
- DELMIA - Arc Welding Programmer
- DELMIA - Human Catalogs
- DELMIA - Human Work Analysis
- DELMIA - Robot Controller Library
- DELMIA - Robot Controller Library
- DELMIA - Robot Controller Library
- DELMIA Automation - Virtual System Setup
- DELMIA - Robot Controller Library

Core configuration

- DELMIA - Workcell Builder
- DELMIA - Robot Simulation
- DELMIA - Human Workplace Simulation
- DELMIA - Assembly Work Instructions
- DELMIA Automation - Virtual Control Validation



DELMIA PLM Express: Assembly Work Instructions

Specify the Assembly Process with Work Instructions

Benefits

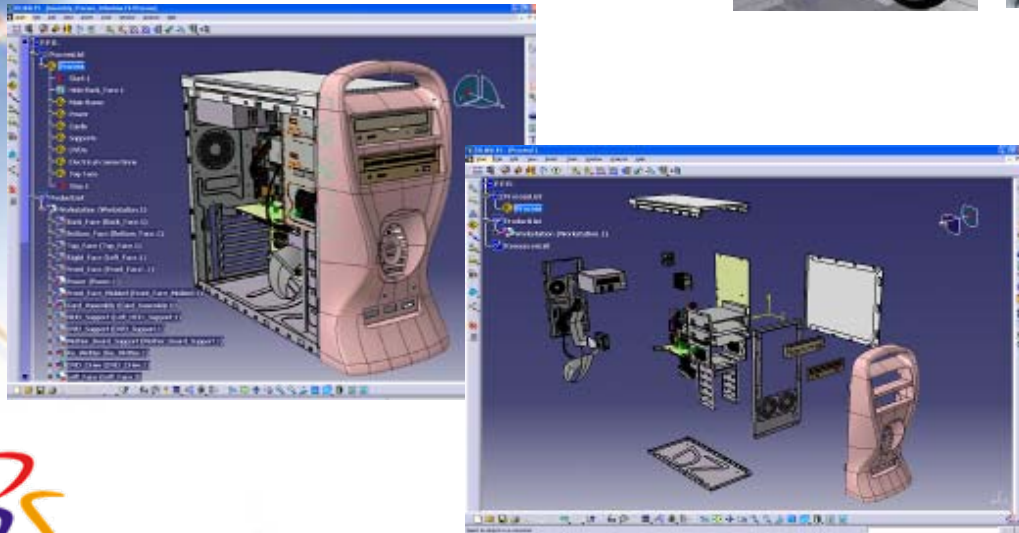
- Reduce time to generate work instruction documents
- Reduce errors in communication
- Regenerate work instructions to reflect all changes on geometry
- V5 native application
- Enables generation of paper based work instructions OR paperless 3D xml work instructions
- Fast and easy to use
- Capitalization on assembly processes

Dedicated to industrial designers or Manufacturing Engineers in any industry

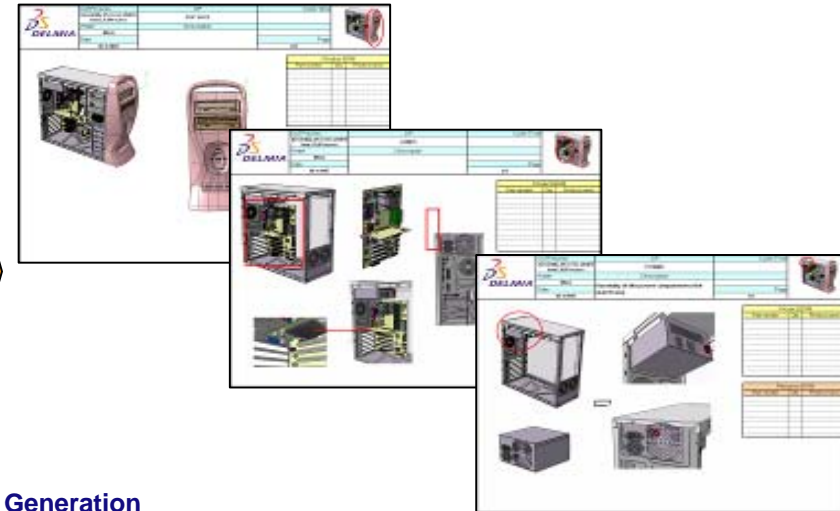


Capabilities

- Define/author an Assembly Process
- Generate Assembly work instructions documents from 3D Data
- Automatically Regenerate Shop Floor Instruction documents when Design changes
- Create Assembly sequences that can be re-used and Assembly simulation Movies that can be viewed on the shop floor using any free viewer



Assembly Process Authoring and Automatic Work Instructions Generation



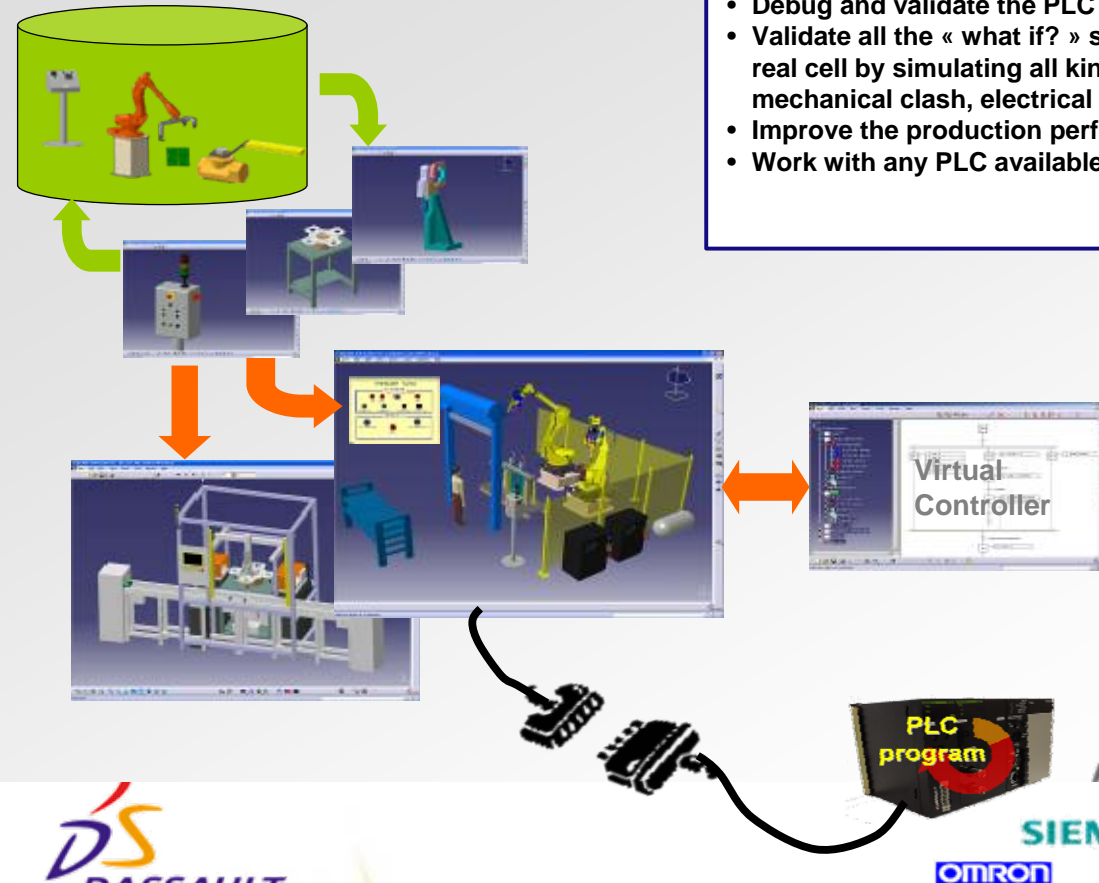
DELMIA PLM Express: Virtual Commissioning

Capabilities

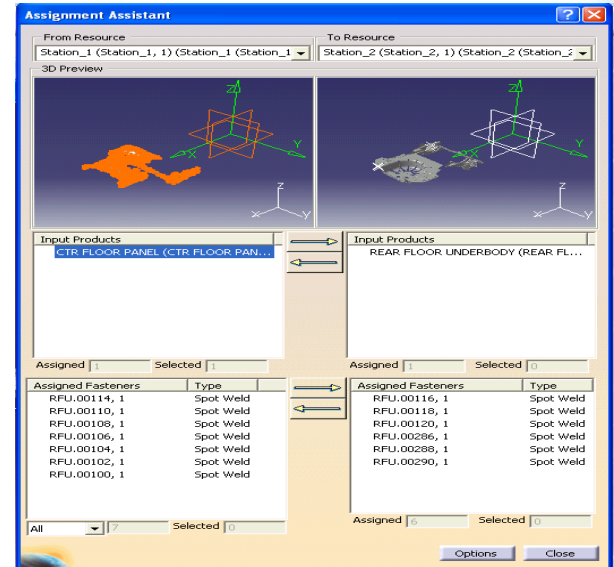
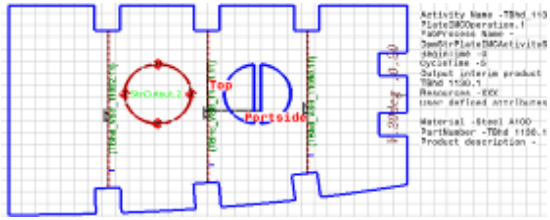
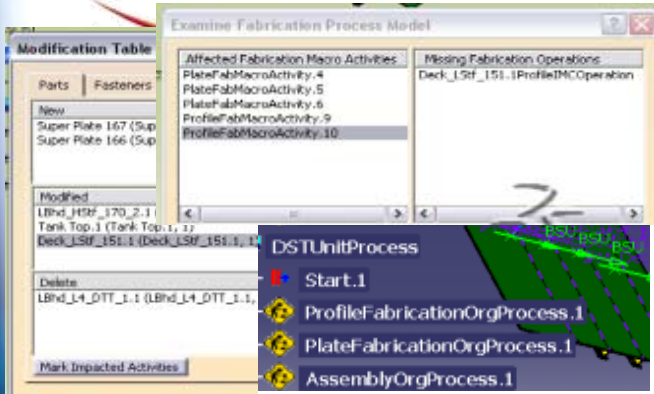
- Validate the full control that will be in the factory prior to physical commissioning
- Debug and validate the PLC code in a virtual environment
- Validate all the « what if? » scenarios that can occur in the real cell by simulating all kind of defects (sensors broken, mechanical clash, electrical shut down)
- Improve the production performances of the cell
- Work with any PLC available on the market

Benefits

- Reduce by 40% the time for physical commissioning by Control Engineers on shop floor
- Production start-up earlier
- Ensure to reach the production performances
- Reduce maintenance costs by an off line validation
- Provide virtual environment for operator training
- Benefits all manufacturing industries



DELMIA PLM For Your Industry



- **Production Ready BiW Solution:**
 - ✓ Easy-to-use UI for 3D State Management
 - ✓ Extended capabilities for Resource Management
 - ✓ Usability enhancements for Fastener Management in DPM
 - ✓ Resource library management in DPM V5
 - ✓ Performance breakthrough in Fastener Planning

- **Production Ready Ship Building Solution:**
 - ✓ Generated DXF files directly usable by cutting machines
 - ✓ Plate drawings generated automatically
 - ✓ Seamless flow of data between planners and lofters
 - ✓ Impact management for updates of the EBOM
 - ✓ Support of profile twisting
 - ✓ Exposure of C++ CAA APIs for ALMA



DELMIA PLM For Your Industry

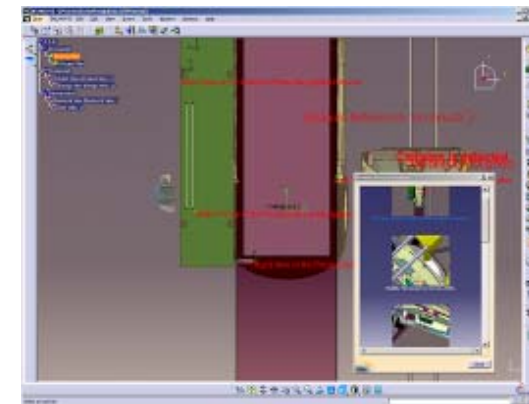
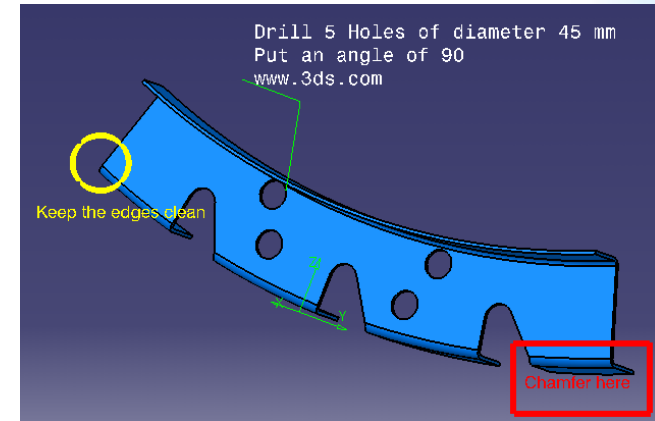


Assembly Detailing

Enhanced Usability

- Immersive 3D Work Instructions which visually identify key features
- Easy process state 3D navigation with Thumbnails
- Image capture to show product buildup
- Engineering Requirements Consumption supported for new tolerance types
- Performance improvements

Faster SOI generation



DPM Work Instructions



DPM Shop Order Release



DPM Review

DELMIA PLM For Your Industry

© 2001 DASSAULT SYSTEMES - R2

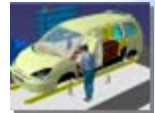
ASSEMBLY PLANNING & VALIDATION



LINE BALANCING & RESOURCE PLANNING



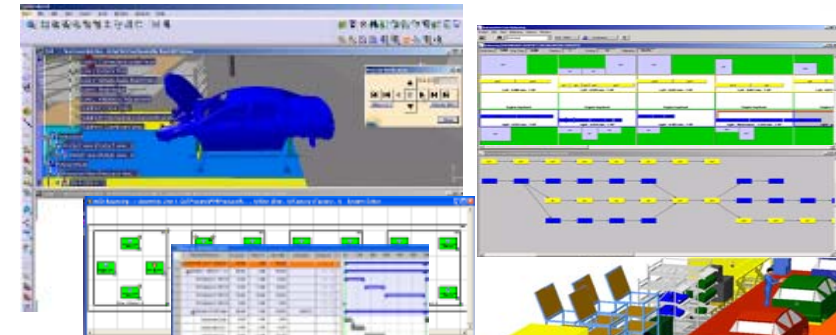
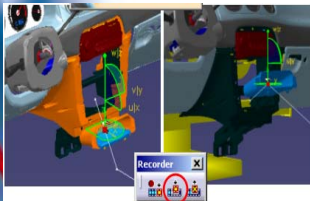
STATION VALIDATION & LINE OPTIMIZATION



Seamless End to End Final Assembly Process Planning Solution

- 👤 ALB balancing results available in DELMIA V5 for viewing, editing & verification (line layout & balanced processes)
- 👤 Fine balancing and optimization in V5 with Manufacturing System Definition (MSD)

- ✓ Open ALB with fixed number of stations
- ✓ Pool of unbalanced processes available in ALB
- ✓ Check and modify material area layout in V5
- ✓ Part bins instantiated in V5 for content identification
- ✓ Balanced processes of ALB available for Process Verification in V5



Reduce setup time for Process Verification through simplified definition of 3D States and positions (for BiW & FA)

- ✓ Enhanced 3D State Management
 - New commands: Synchronize Position, Modify Position, Redefine Reference Object
 - Define Condition command: filter capability for assigned items or resources
 - Create new state command: option to synchronize 3D with the state definition
 - Keep assembly state after closing Process Verification



DELMIA PLM For Your Industry



Increased Competitiveness !

- Fill Gaps in Capabilities
- Many Usability Enhancements

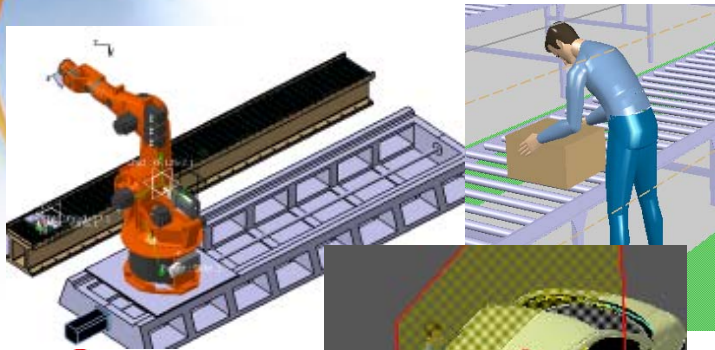
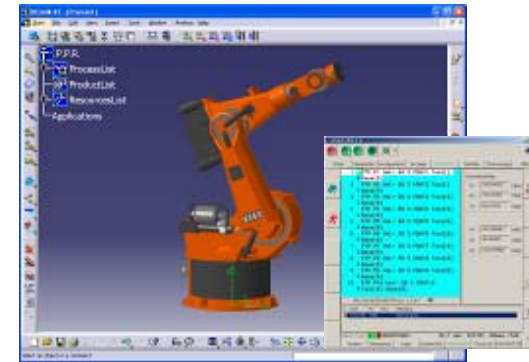
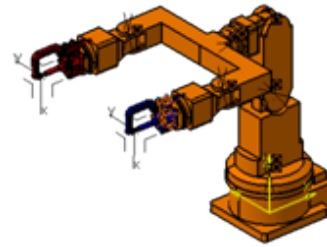
For:

- Tool Selection Assistant
- Arc Welding
- Paint
- Human Builder & Human Task Simulation

RRS II & Off line Programming Completeness

Ready to aggressively attack the Market !

- Full RRS support for Robot Paint Solution customers
- Complete integration of RRSII and NRL Teach to support non-teach pendent RRSII VRCs



Enhance the workflow Coverage with new Applications

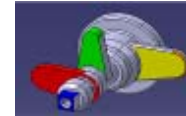
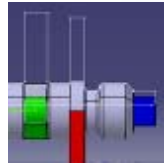
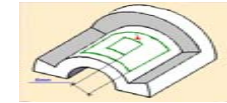
- New Realistic Cable Simulation (R18sp2)
- First Production System Simulation Capabilities in the PLM

DELMIA PLM For Your Industry

Further increases CATIA/DELMIA Machining NC programming and simulation efficiency

Reinforce Turning products including Simulation : **Turning with Simulation**

- ✓ Define, program and simulate Lathe and Mill-Turn Machines
- ✓ Productivity Lathe enhancements driven by key customers
- ✓ Turning revolution envelop to be used as input geometry
- ✓ New operation to support "4-axis Pocketing" (MillTurn)



Machining with Simulation

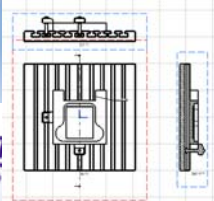
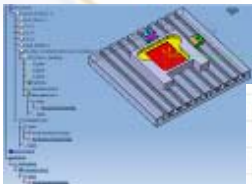
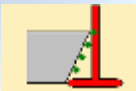
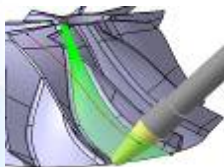
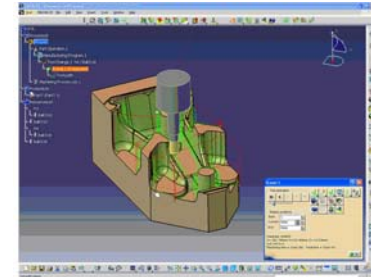
- ✓ Support lathe and mill-turn machines: multi-spindle, multi-turrets
- ✓ Sub-program support for NC Program
- ✓ Capability to run simulation in batch

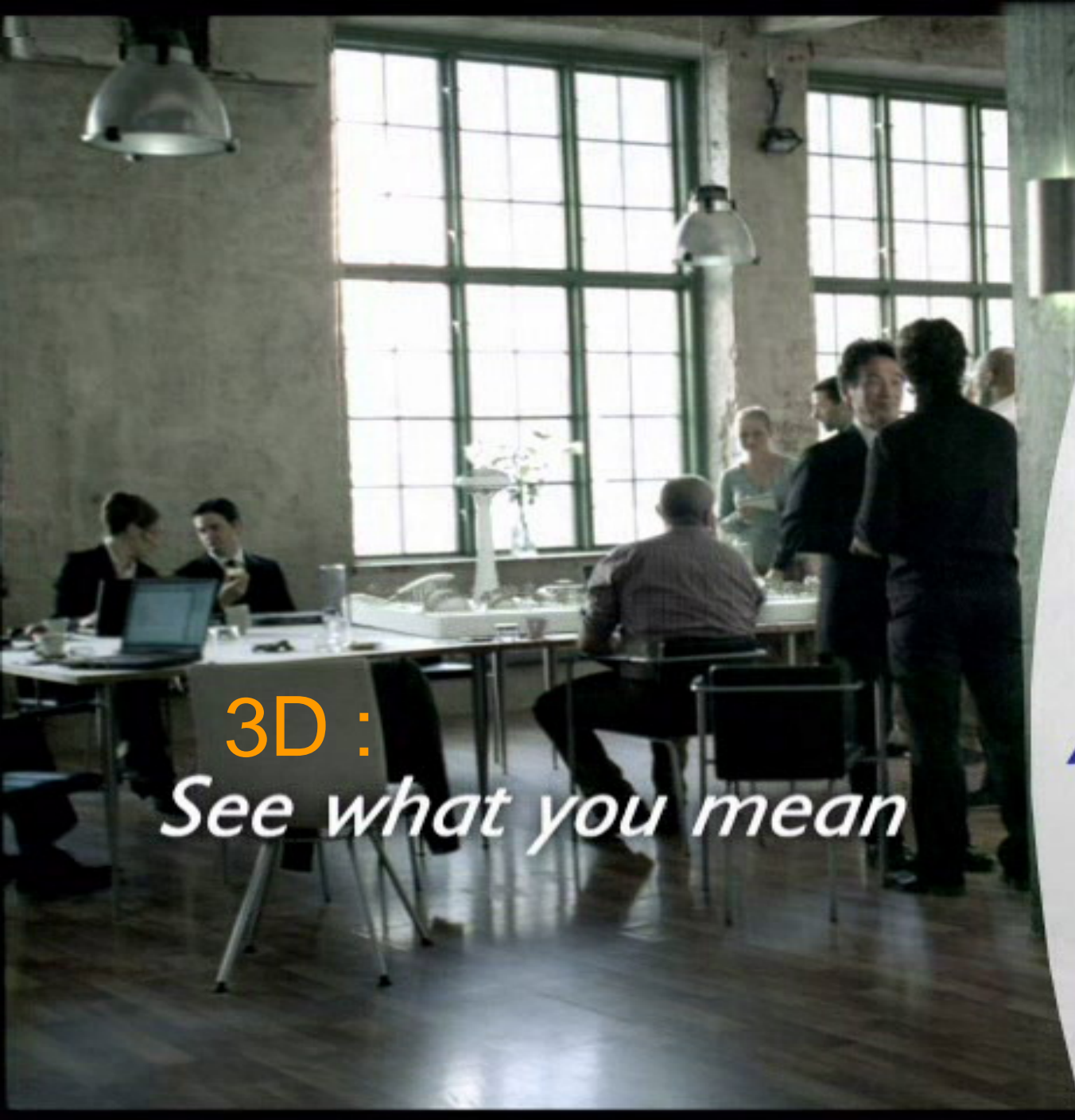
Complex Multi-axis Machining : "Strong technological driver"

- ✓ Enlarge 3-axis Machining to variable tilt angle of cutter (3 → 5-axis Machining)
- ✓ Zlevel operation with T-slotted to machine undercut areas
- ✓ Barrel cutter in Multi-axis Sweeping
- ✓ New 5-axis spiral milling operation
- ✓ Tool axis driven by a curve in 5-axis operations
- ✓ Multi-part programming (pallet or panoply)
- ✓ Reduce programming time: Multi-operation editing... Spit on collision
- ✓ Reduce machining time: tool path quality initiative: less air-cutting, fewer cutting points

Continue to enhance DPM Machining as a Work Instructions authoring tool

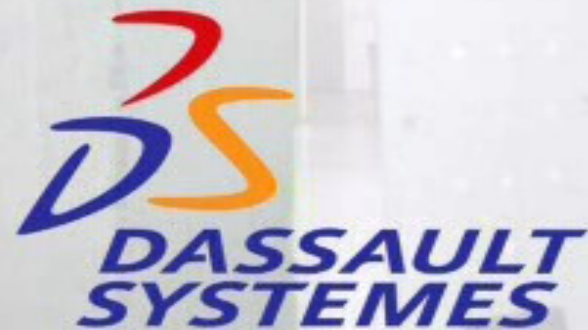
- ✓ Link to drawing management (including Manufacturing Hub)
- ✓ Extraction of drawing from IPM including its context





3D :
See what you mean

Thank You !



www.3ds.com

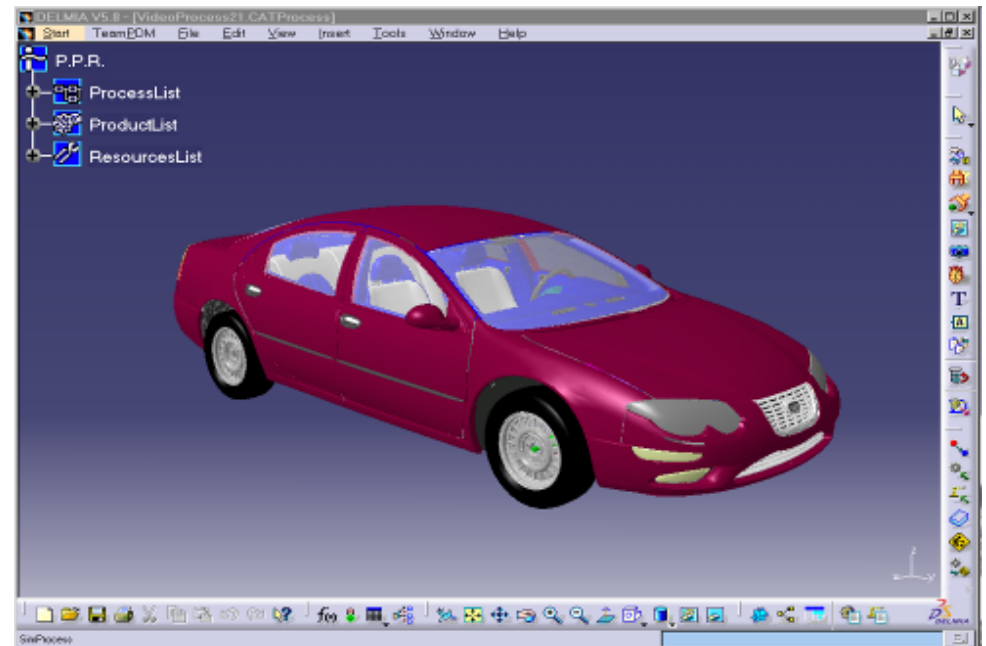
DELMIA a Holistic approach for “Production Performance”

- 1 Industry Specific workflow processes
- 2 De-facto standard for Digital MFG
- 3 Solution for company of all sizes (OEM & suppliers)

- 4 Single V5 Architecture and Manufacturing Hub
- 5 Most extensive direct and partner coverage to support WW implementations



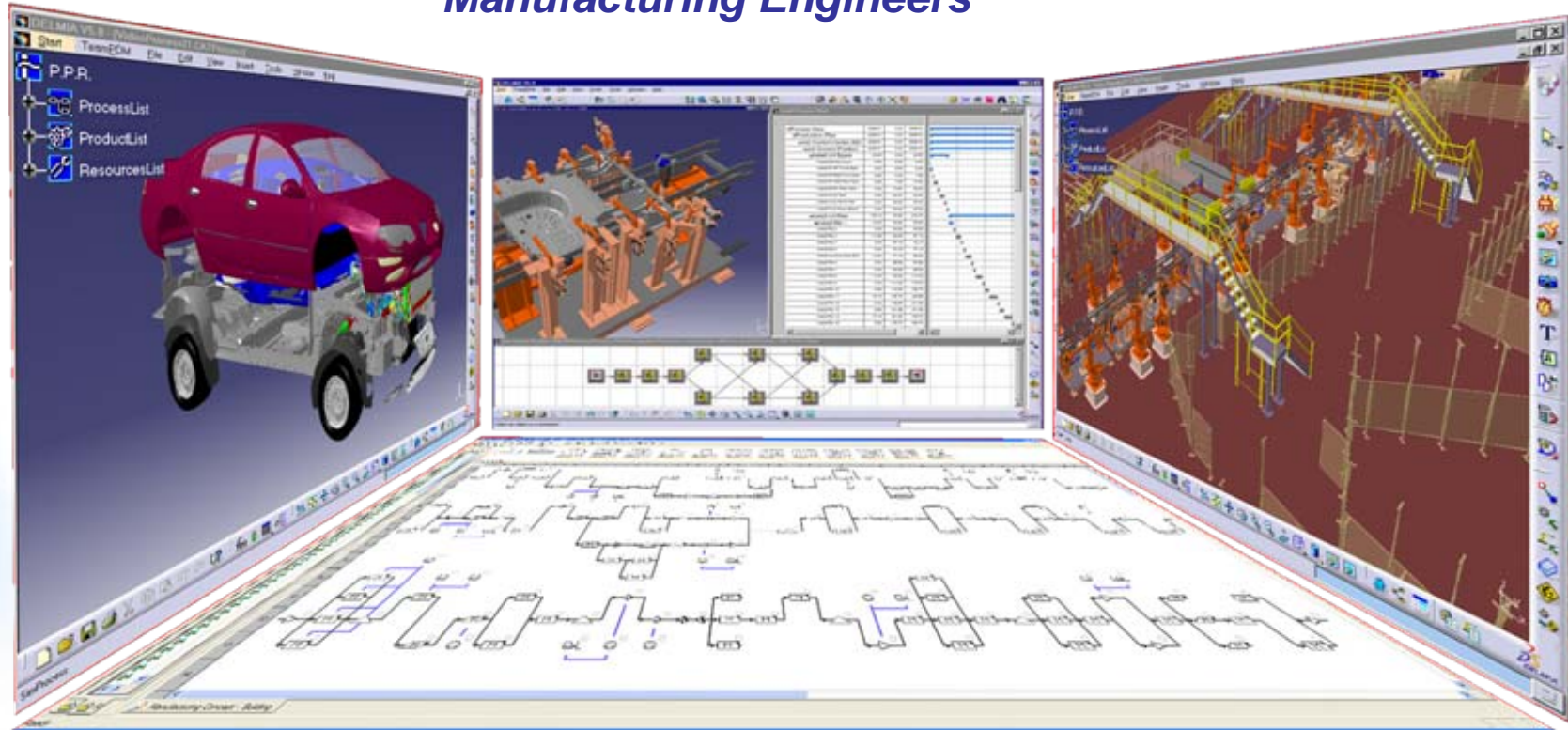
DELMIA
*collaboration
Intelligence for
Digital
Manufacturing*



DELMIA for Collaborative Intelligence in MFG

“Global Engineering for Innovation”

① Single Desktop for Planners and Manufacturing Engineers



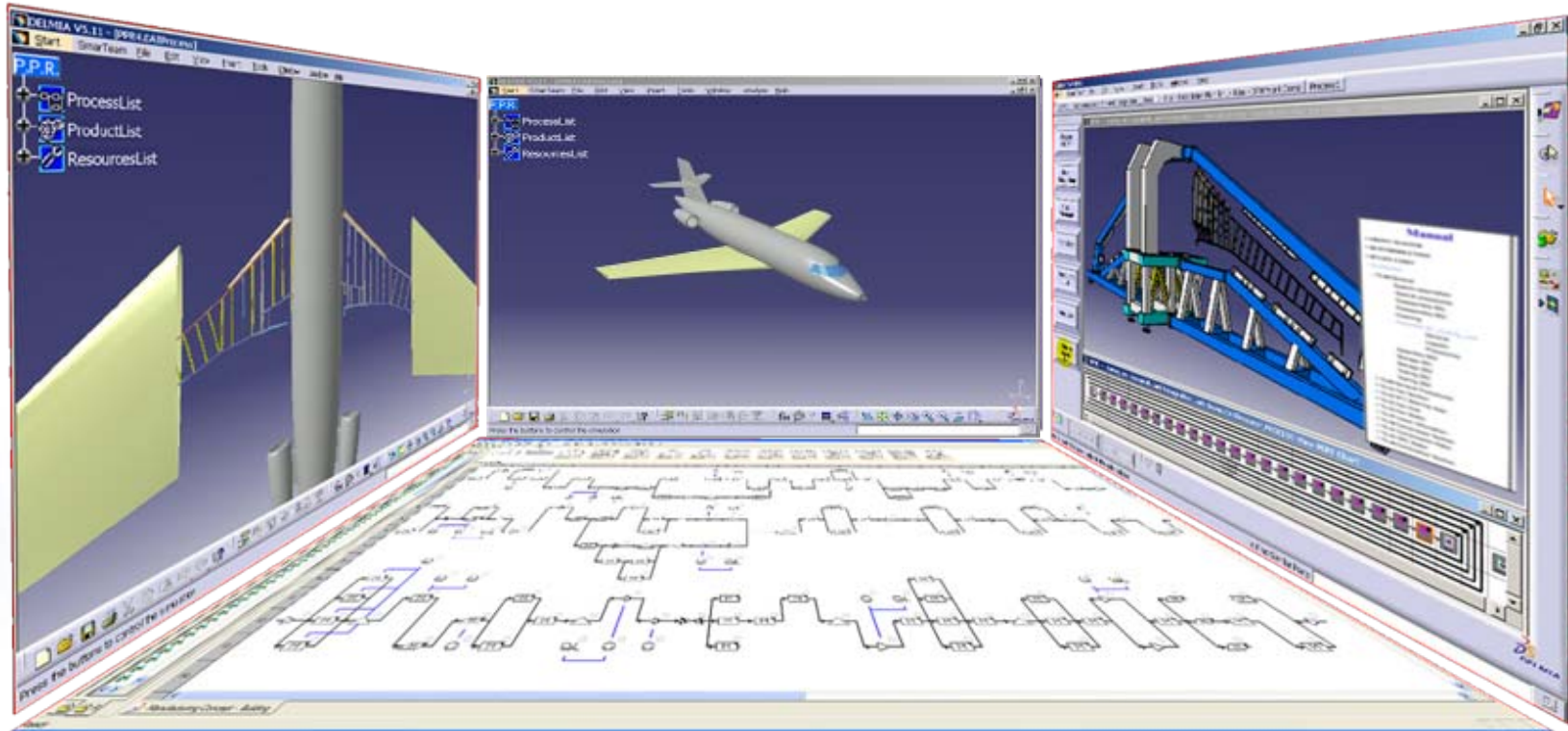
**② Digital production
Engineering concurrent with
product design.**

**③ Model based process planning
enables manufacturing best practices
capitalization & reuse**

PLM Manufacturing Desktop

“Global Engineering for Innovation”

④ Creation and validation of Virtual Build & Maintenance processes through digital validation.



⑥ Virtual start-up of the factory and leverage of production engineering data on the shop floor

⑤ Collaborative digital manufacturing workplace

