



# Auto T-1 Supplier “Day in the life” Digital Manufacturing

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# Auto Suppliers' Challenges



# Auto Suppliers Challenges [1/4]

Related to DM



- ▶ Strong need to be **innovative**, in order to be successful.
  - ▶ Technology innovation
  - ▶ Cost innovation





# Auto Suppliers Challenges [2/4]

Related to DM



- ▶ Huge pressure from the OEMs to:
  - ▶ Reduce unit production cost
  - ▶ **Shorten planning** time ... but maintain product quality

### The Gravy Gap

**The Value of Reducing Cost Early:**  
Assume:

- Target price \$1.10, annual volume of 100,000 Vehicles
- 5% yearly revenue reduction
- 10% of the first year revenue is profit

**Typical Scenario Today:**

	Expenses	Sales	Volume	Annual Expenses	Annual Sales	Annual Profit
Year 1	\$ 1.000	\$ 1.100	100,000	\$ 100,000	\$ 110,000	\$ 10,000
Year 2	\$ 0.945	\$ 1.045	100,000	\$ 94,500	\$ 104,500	\$ 10,000
Year 3	\$ 0.893	\$ 0.993	100,000	\$ 89,275	\$ 99,275	\$ 10,000
Year 4	\$ 0.843	\$ 0.943	100,000	\$ 84,311	\$ 94,311	\$ 10,000
				\$ 368,086	\$ 408,086	\$ 40,000

**15.7% Savings Required to Meet Constant Profit for the life of the product assuming that there was no investment cost**



# Auto Suppliers Challenges [3/4]

Related to DM



- ▶ Dramatic increase in the number of product **variants**, which introduces huge complexity to the process planning

- ▶ Example – seats:

- ▶ Heating
- ▶ Sports configuration
- ▶ Leather / others coating
- ▶ Electrical / mechanical adjustments
- ▶ Embedded ventilation
- ▶ Embedded airbags
- ▶ Back rigidity control (similar to airplanes)
- ▶ Embedded headrest display
- ▶ Posture memory
- ▶ Folding seat (for Convertible cars)
- ▶ Embedded baby seat
- ▶ Easy disassembly seat (supports more trunk space)





# Auto Suppliers Challenges [4/4]

Related to DM



- ▶ Work is divided between different teams and sites – a strong need for **collaboration**
- ▶ Occasionally need to communicate with other suppliers
- ▶ Last minute **changes** of the product imposed by the OEM, which derives significant effort & shop floor H/W cost
- ▶ Tough technical **audits** by the OEMs
- ▶ Requirements for JIT & JIS **delivery**
- ▶ Peak demand after SOP is reached quickly, and there is a need:
  - ▶ To shorten the **learning** curve.
  - ▶ To **balance** resources & match also further lower demand.



# Digital Manufacturing for Auto Suppliers



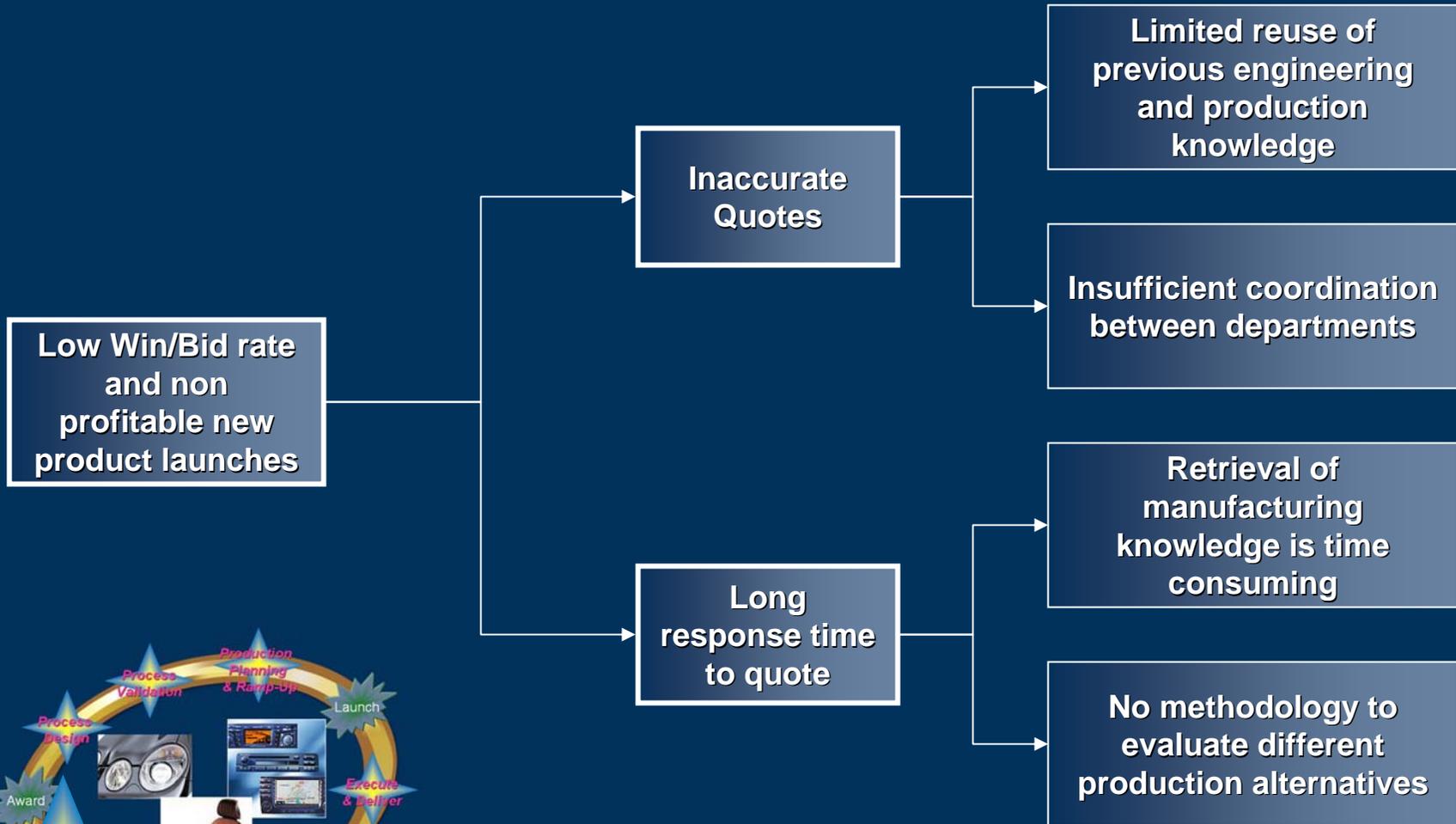
# Digital Manufacturing Within PLM

## For Auto Suppliers





# Quote – Is it accurate and profitable?





# Tecnomatix Quote Solution: ...Accurately, quickly, profitably



## Accurately quote a new project enabling timely response to OEM

- ▶ Reuse best-in-class processes that are stored in your repository
- ▶ Aggregate and analyze manufacturing related costs
- ▶ Evaluate and select best manufacturing alternative
- ▶ Validate manufacturing concepts in early phases
- ▶ Share online manufacturing concepts with team members
- ▶ Prove to your prospect your ability to meet targets – price, quality, volume



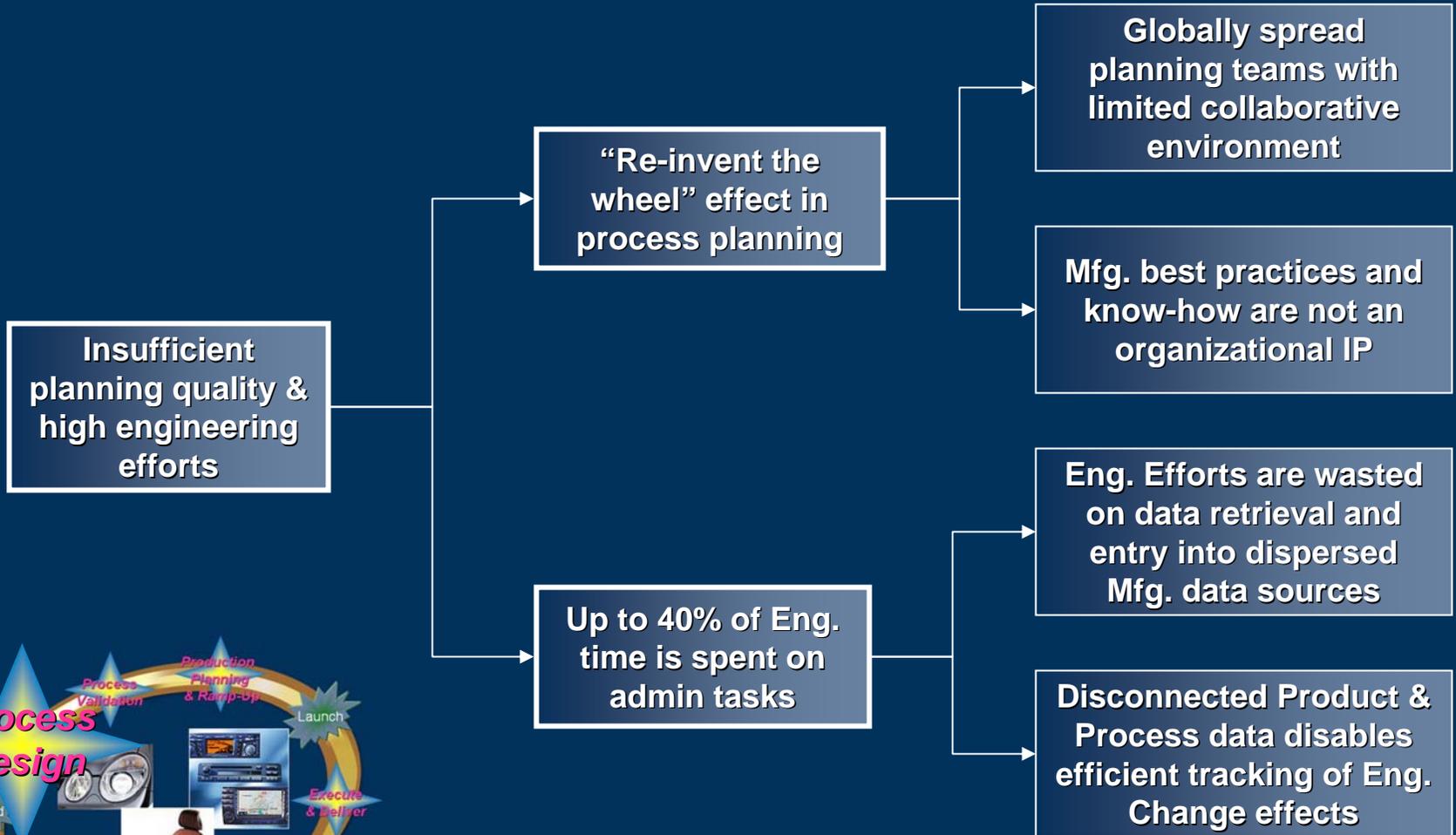
The screenshot shows the 'eMPower Quote Master' software interface. It displays a quote alternative parameters table and a quote alternative results table. The quote alternative parameters table includes fields for Quote, Customer, Product type, Product sub-type, Production year, and Comment. The quote alternative results table includes fields for Hardware costs, Labor costs, Additional costs, Required space, Processing time, Total cost, and Unit Cost.

Quote Alternative Parameters	
Alternative:	Quote 1 Alternative 1
Created by:	administrator
Creation date:	20/03/2005
Production Quantity:	Annual quantity: 10000 Yield Factor: 95%
Production Pattern:	Working days per year: 300 Shifts per working day: 3 Hours per shift: 8
Related Costs:	Energy unit cost: 2 Annual space unit cost: 12 Additional costs: 100000

Quote Alternative Results	
Hardware costs:	Cost of resources: 256 Cost of energy: 352 Cost of space: 8928
Labor costs:	0
Additional costs:	100000
Required space:	144
Processing time:	23
Costs:	Total cost: 109546 Unit Cost: 109.546



# Process Design – Is it efficient?



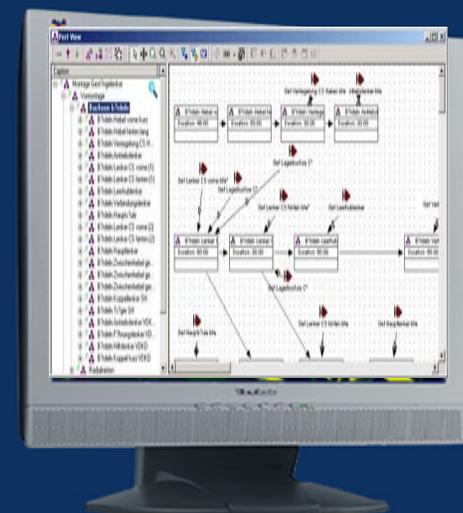


# Tecnomatix Process Design Solution: ...Faster, Better



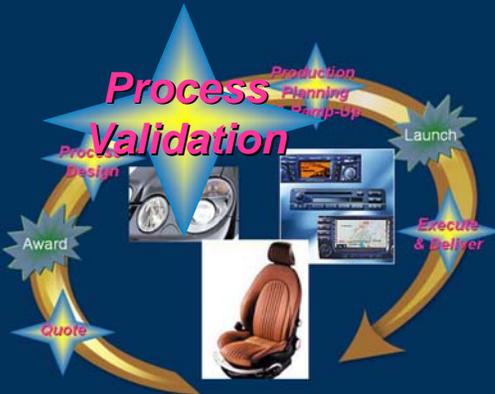
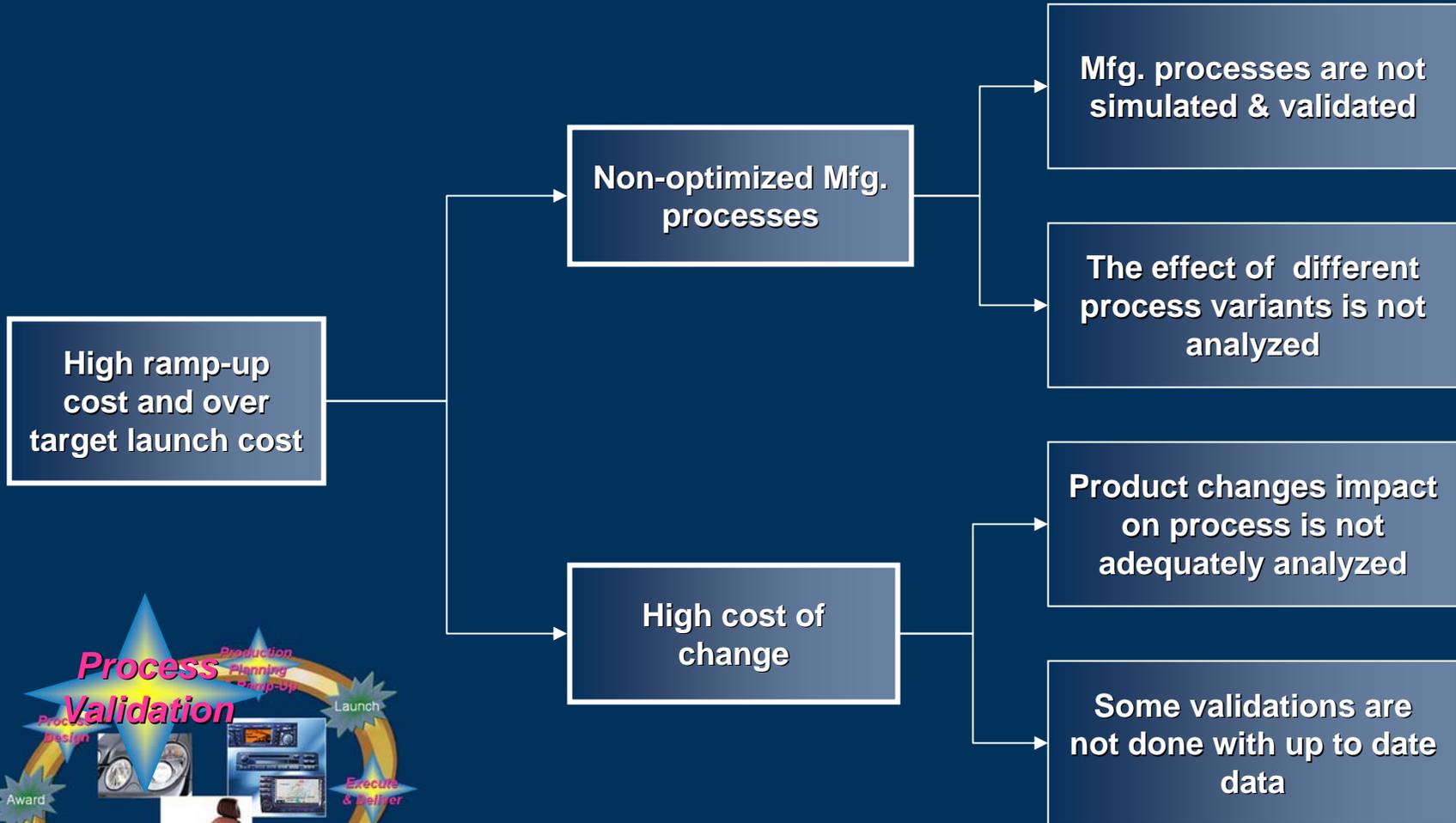
## Reduce effort and duration of new process design

- ▶ Design production lines and workstation
- ▶ Reuse template processes stored in the Manufacturing Process Repository
- ▶ Link Product, Process, Plant and Resources to form the eBOP – electronics Bill of Process
- ▶ Effectively evaluate the manufacturing impact of design changes and enable process driven product design
- ▶ Support lean manufacturing and value stream mapping initiatives
- ▶ Enable multi-user, multi-site collaborated process design





# Process Validation – Is Your Production Process Optimal?





# Tecnomatix Process Validation Solution: ...Enable Error Proof Launch



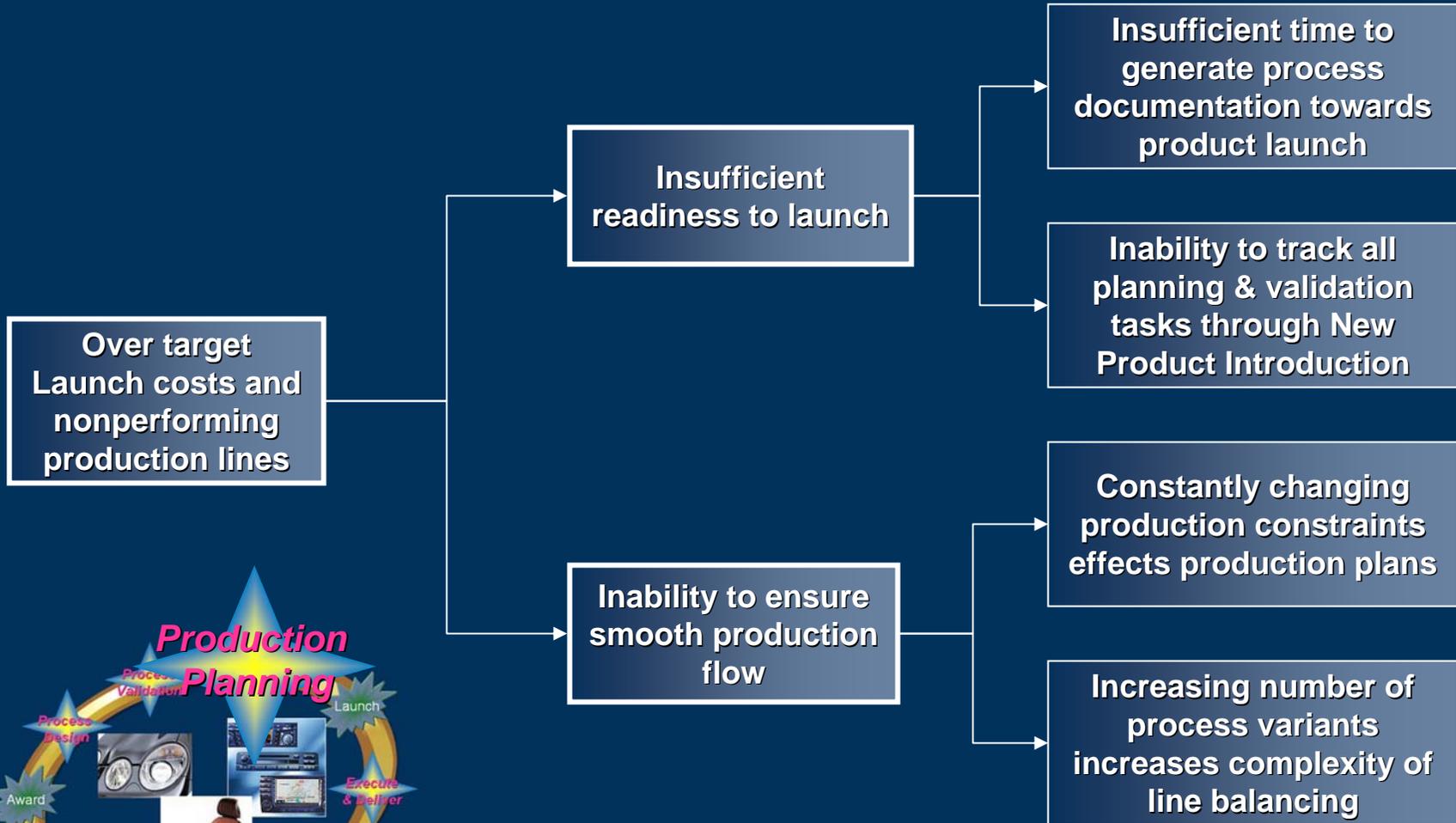
**Virtually validate manufacturing processes to ensure successful new product launch**

- ▶ Validate product assemblability and manufacturability in a 3D environment
- ▶ Simulate your production processes to ensure smooth material flow
- ▶ Run what-if scenarios to identify bottlenecks
- ▶ Validate your process ergonomically using dynamic simulations
- ▶ Analyze product variants scenarios





# Production Planning – Are You Ready for Serial Production?





# Tecnomatix Production Planning Solution: ...Successful Profitable Launch



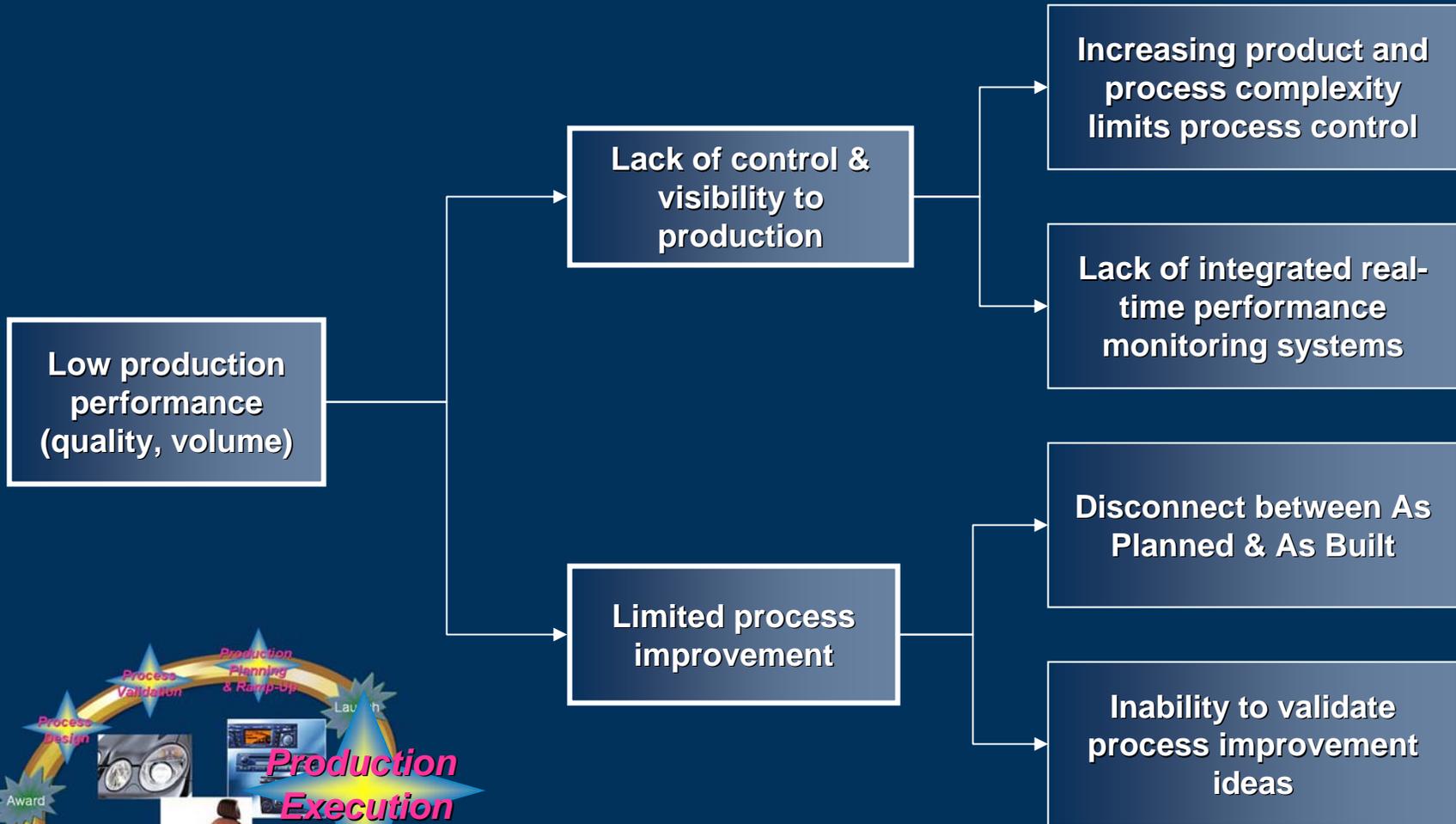
**Launch on time, and improve production performance, productivity and flexibility**

- ▶ Transfer manufacturing process knowledge: from central planning department to plants, between plants, with your customers and suppliers
- ▶ Balance lines per given product mix and line condition
- ▶ Generate process documentation – easily, effortlessly
- ▶ Dynamically validate your line balancing with discrete event simulation
- ▶ Prepare production plans





# Production Execution – Is It Performing?



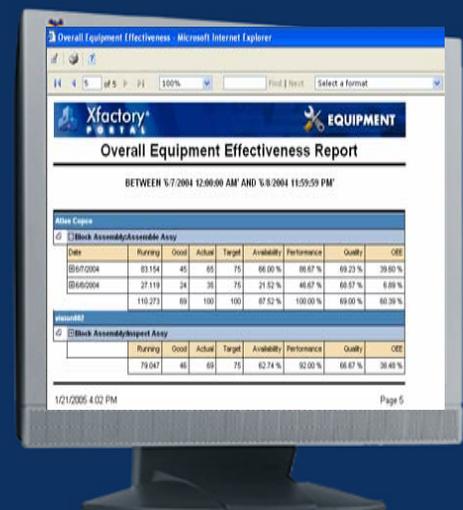


# Tecnomatix Production Management Solution: ...Control and Improve



## Control production processes and enable continuous process improvement

- ▶ Track orders, work in process, resources and material in real time
- ▶ Collect accurate and up to date production data
- ▶ Reduce cost of non-conformance with traceability and genealogy
- ▶ Analyze production data – trends, Key Performance Indicators, Overall Equipment Efficiency
- ▶ Continuously improve production processes





## UGS is Uniquely Positioned to Deliver Value

- ▶ Life Cycle Applications
  - ▶ Detailed process views with high Ease of Use
  - ▶ 3D enabled planning and process simulation
  - ▶ Ability to meet life cycle process definition requirements
- ▶ Enterprise Class Capabilities
  - ▶ Resource Management
  - ▶ Change/Project/Workflow management
  - ▶ 3D enabled Collaboration
- ▶ Enterprise Data Management
  - ▶ Data model representing product, resource, operation and plant
  - ▶ Product and Process Variant and Effectivity management
  - ▶ Integration of Manufacturing and Product Development Processes



# Auto T-1 Supplier – Day In The Life



# Solution Components

Process Designer

Process Simulate  
Assembler / Weld / Human  
Robotics

Tc Manufacturing  
Client

Tc Publish

Tc Web

eMServer

CC

## Teamcenter Manufacturing Backbone

Product Data

Process Data

Factory Data

Resource Data



# Process Planning Tools



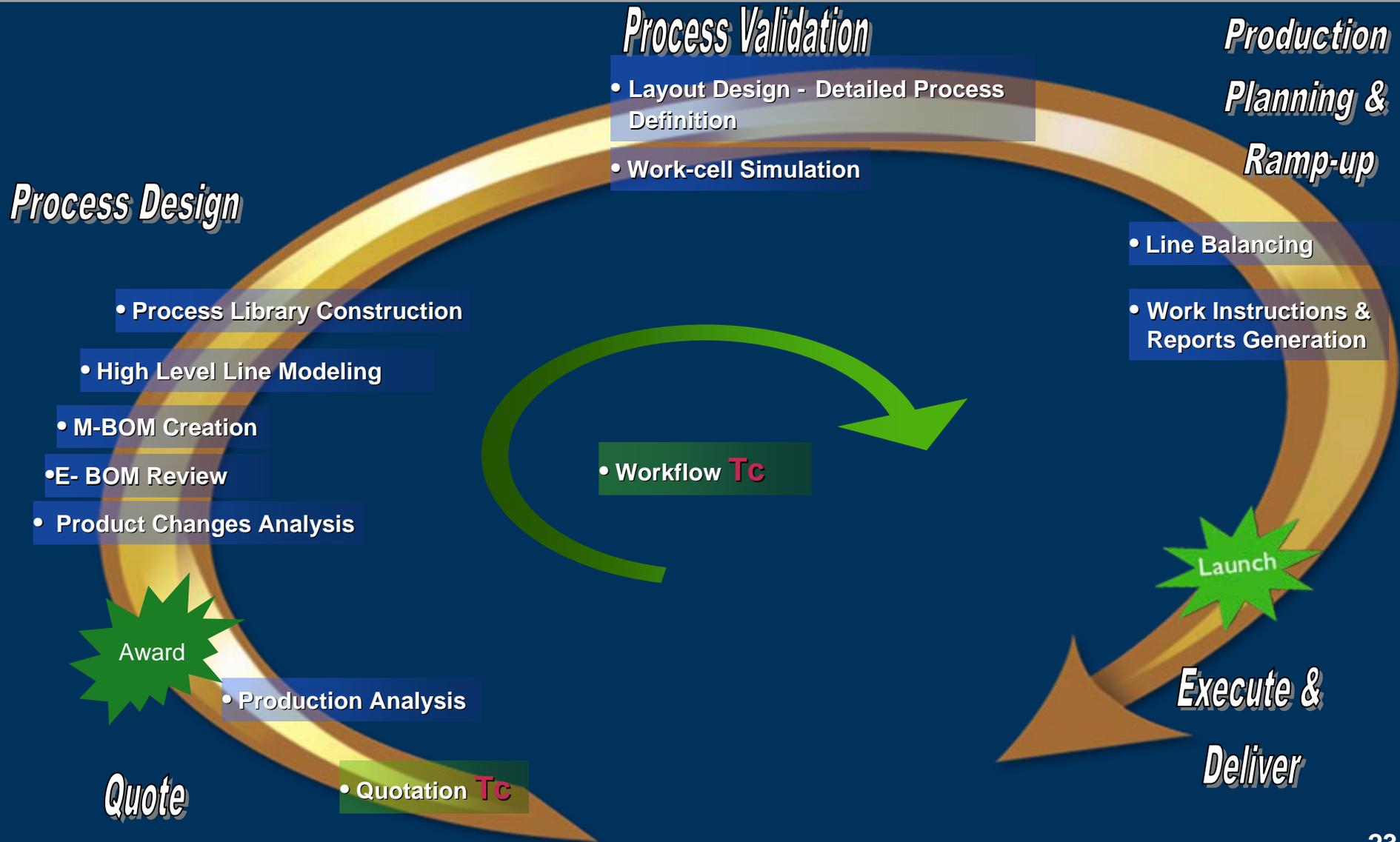
- ▶ TC Manufacturing – Process Backbone
- ▶ Process Designer – Planning Environment
- ▶ Process Simulate – Detailed Simulation
- ▶ Web-Based BOP-Manager – **Bill** Reports and Work Instructions

Station : Station 4 **		Total Time : 120	
Operations	Time	Parts	Images
Fix Glovebox housing	8	Glovebox	
Install latch fastener	8	Fastening	
Fix left stirrup	5	Stirrup left	
Fix right stirrup	11	Stirrup right	



# Automotive T1 Suppliers

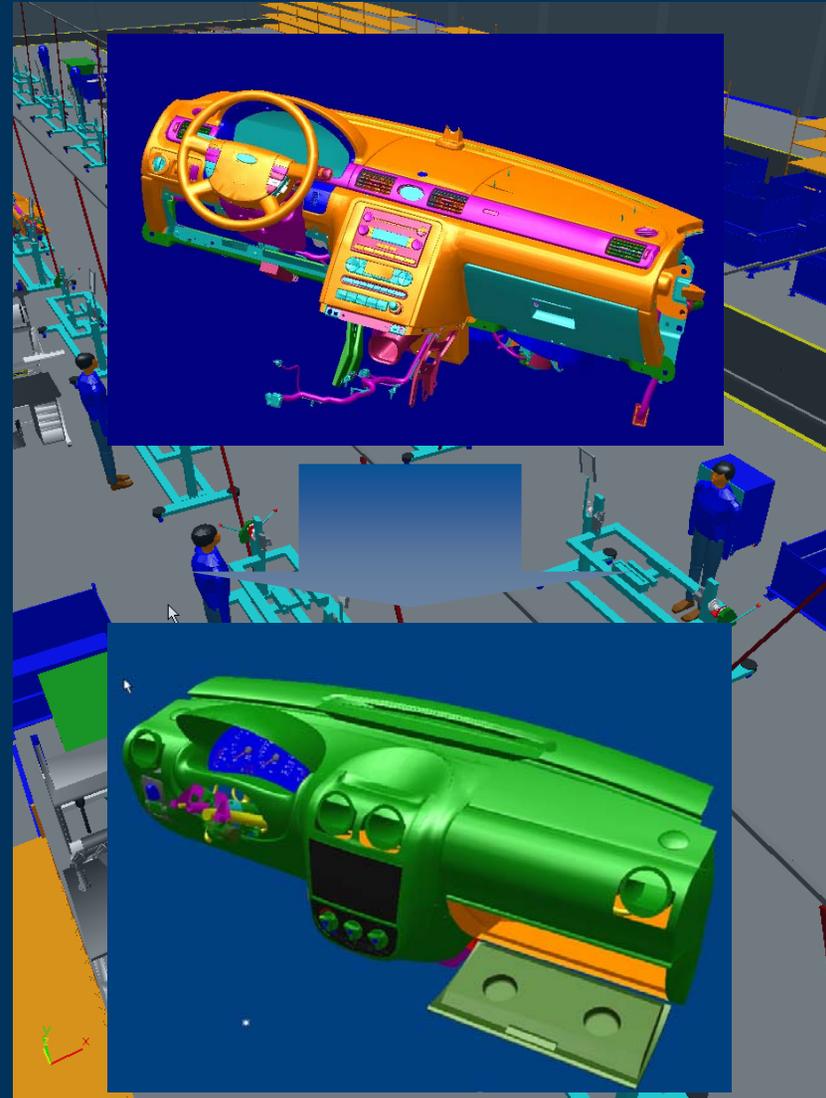
## Digital Manufacturing Tasks





# Story Review

- ▶ Automotive T1 supplier Plant for vehicle Instrument Panels
- ▶ The Current Instrument Panel will be replaced by a new model and needs to be introduced into the existing manufacturing lines
- ▶ Main Objectives:
  - ▶ Analyze the manufacturing needs based on Organizational Know-how; capturing and reuse of the best Manufacturing knowledge.





# Summary



# Automotive Suppliers UGS Digital Manufacturing Solution Benefits



- ▶ Reduce manufacturing planning efforts and duration
- ▶ Increase manufacturing process quality, commonality and consistency
- ▶ Support production technology & cost innovations initiatives
- ▶ Improve production performance metrics
- ▶ Capture organization production knowledge
- ▶ Improve collaboration over manufacturing process
- ▶ Enable continuous process improvement
- ▶ Support sales processes and production audits



# Leading Auto Suppliers have already embraced UGS DM Solution...





[www.ugs.com](http://www.ugs.com)