Leveraging manufacturing knowledge in a global innovation network environment

Ulrich Rossgoderer
UGS Products
Manufacturing Solutions Group
11-May-06
UGS Enterprise PLM

NX
Transforming product development

Tecnomatix
Transforming manufacturing & production

Solid Edge
Evolving to 3D for competitive advantage

PLM Components
Open solutions for standardization & interoperability

Teamcenter
Capturing & sharing product knowledge
Introducing Tecnomatix Digital Manufacturing

Transforming the process of manufacturing

A complete digital manufacturing solution that helps companies quickly identify the best strategies for boosting productivity and lowering cost.
Assembly Process Planning is an integral part of Digital Manufacturing.

Plan the best process to design, validate & execute world-class assembly manufacturing systems.

- Process planning
- Assembly validation
- System balancing & costing
- Automation & programming
Manufacturing Challenges

1. More Products, models & Variants
2. Increasing product and process complexity
3. Multi Plant Production - Globalization
4. Mix Model Assembly Lines
5. Continuous Process Improvement
6. Re-use Existing Production Resources & Facilities
How to maintain Profitability
By shortening Time to Market
And reducing Cost
In a Global Environment
Manufacturing Engineering Struggle

Product Engineering

Manufacturing Engineering

Production

CAD/PDM

ERP/MES

Effort / Cost

Point Solutions

Non-predicted Launch Cost

Effort / Cost

Product Development

Process Development

© UGS Corp. 2005. All rights reserved.
Current Best Case Process Knowledge Capturing & Retrieval System
Process Design Complexity

Product
Variant A

Process A

Product
Variant B

Process B

SEQUENCE OF EVENT (SOE)

Model

Process

Resources

© UGS Corp. 2005. All rights reserved.
Process Design Complexity

Plant A

Product Variant A

Process A

Resources

Product Variant A

Process A

Plant B

Product Variant B

Process B

Plant C

Product Variant B

Process A

Plant D

Product Variant B

Resources
Manufacturing Data Complexity

Engineering

Manufacturing

Product Assembly

Product CAD File

Product Visualization

Product Documentation

Revision / Effectivity

eBOM

PDM

mBOM

Assembly Planning

Part Planning

Quality

10 - 100X MORE DATA
Impediments to Achievement

Disconnected Product and Process data disables tracking of Eng. Change effects

Lack of upfront Mfg. process validation causes launch of non-optimized processes

Eng. Efforts are wasted on data retrieval and entry into dispersed Mfg. data sources

Globally spread planning teams with limited collaborative environment causes waste of waiting time

High Launch Costs

Profitability, Time to Market, Cost, Globalization

Insufficient Planning Time
Impediments to Achievement

**Pains**

- **Disconnected Product and Process data**
  - disables tracking of Eng. Change effects
- **Lack of upfront Mfg. process validation**
  - causes launch of non-optimized processes
- **Eng. Efforts are wasted**
  - on data retrieval and entry into dispersed Mfg. data sources
- **Globally spread planning teams with limited collaborative environment**
  - causes waste of waiting time

**Needs**

- **Ability to track Eng. Changes and assess their effect on Mfg. processes**
- **Ability to analyze, validate and optimize processes upfront**
- **Ability to define, manage and reuse validated, best-in-class assembly processes**
- **Ability to standardize processes, resources and methods**
- **Ability to collaborate with global planning teams**
UGS Assembly Planning Solution

- An **End to End methodology and integrated toolset** for planning, validating, managing and releasing a Manufacturing Assembly Process
- Based on **Tecnomatix Assembly Planning** suite of products
- Enables Manufacturing Engineers to **define an Electronic Bill Of Process (eBOP)** - linking Product Parts, Plant, Resources and Operations together

- Featuring **Manufacturing Data Management; Interactive 3D graphics environment for Assembly Process design; Process Effectivity; Product, Process and Plant 2D and 3D views; Time Estimation; Change Management; Resource Management; Work Instructions and reporting**
Assembly Planning Solution
Workflow 1/3

- Compare previous & new or modified product design
- Create new process from template
- Review product / process association
- Modify process and assign consumed parts

I can quickly identify changes!
Assembly Planning Solution
Workflow 1/3

- Compare previous & new or modified product design
- Create new process from template
- Review product / process association
- Modify process and assign consumed parts

I can reuse best-in-class processes!
Assembly Planning Solution
Workflow 1/3

- Compare previous & new or modified product design
- Create new process from template
- Review product / process association
- Modify process and assign consumed parts

I understand what needs to be changed!
Assembly Planning Solution
Workflow 1/3

- Compare previous & new or modified product design
- Create new process from template
- Review product / process association
- Modify process and assign consumed parts

I can design processes in a 3D environment!

© UGS Corp. 2005. All rights reserved.
Assembly Planning Solution
Workflow 2/3

- Estimate process time
- Add equipment and tools from classified libraries
- Line layout and workstation design
- Validate assembly feasibility

I can optimize the process upfront!
Assembly Planning Solution
Workflow 2/3

- Estimate process time
- Add equipment and tools from classified libraries
- Line layout and workstation design
- Validate assembly feasibility

Standardization is key!
Assembly Planning Solution
Workflow 2/3

- Estimate process time
- Add equipment and tools from classified libraries
- Line layout and workstation design
- Validate assembly feasibility

I can optimize material flow and ergonomics!
Assembly Planning Solution
Workflow 2/3

- Estimate process time
- Add equipment and tools from classified libraries
- Line layout and workstation design
- Validate assembly feasibility

I can validate processes in early stages!
Assembly Planning Solution
Workflow 3/3

- Handle Engineering Changes
- Route process for approval
- Release process with effectivity
- Collaborate with product engineering and production

I can analyze the effect of changes!
Assembly Planning Solution
Workflow 3/3

- Handle Engineering Changes
- Route process for approval
- Release process with effectivity
- Collaborate with product engineering and production

I can ensure production readiness!
Assembly Planning Solution
Workflow 3/3

- Handle Engineering Changes
- Route process for approval
- Release process with effectivity
- Collaborate with product engineering and production

The correct processes will be executed!
Assembly Planning Solution
 Workflow 3/3

- Handle Engineering Changes
- Route process for approval
- Release process with effectivity
- Collaborate with product engineering and production

I can collaborate in a global environment!!!
Assembly Planning Solution - Benefits

- Reduce Manufacturing Assembly Planning efforts and duration
- Increase manufacturing process quality, commonality and consistency
- Improve collaboration over manufacturing process
- Reduce cost of change
- Capture organization knowledge
Summary

- UGS Tecnomatix Assembly Planning solution enables you today to
  - Reduce Manufacturing Assembly Planning efforts and duration
  - Increase manufacturing process quality, commonality and consistency
  - Improve collaboration over manufacturing process
  - Reduce cost of change
  - Capture organization knowledge
“...It can’t be over-emphasized that Digital Manufacturing solutions need to exist within a PLM environment so that they can manage the processes, data, and resources across the production planning activities and among all of the players (including partners, suppliers, and customers) who are involved in the product development project.”

The Value of Digital Manufacturing in a PLM Environment: A CIMdata Case Study - Fiat Auto S.p.A

March 2005
"We are very satisfied with the deployment of the UGS Tecnomatix solution for process planning. It is now used productively in more than 10 car headlight projects. With the UGS consultants we have initiated a plan to develop the DM as the standard for process planning for all new projects. The deployment project includes training of users from different planning departments, developing of interfaces to other legacy systems, and plugging in additional modules of the system."