An Industrial perspective on processes/products interaction/evolution

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The Largest Independent CAM Software Company in the World

- Full Spectrum “Best-in-Class” CAM Product Line for:
  - Milling
  - Turning
  - Wire EDM

- Any Number of Axis
- Any Combination of Axis
- Any Combination of Technology
- Multi turret – Multi Spindle
New 5-Axis Machining cycles

- The PATENT PENDING Composite Cycle
  - 20 Cycles in one

- Machining Patterns
  - IsoParametric
  - Projected
  - Parallel Planes
  - Planes Perpendicular to Curve
  - Contour Offset

- Tool Orientations
  - Normal to Surface
  - Through Point
  - Fixed Angle
  - Through Curve
Product Strategy

- Improve User Experience - Ease of Use
- KnowledgeBased Automation ("printer driver" paradigm)
- Kernel, Objects and Components
Model for Design
Manufacturing Problems:

Model for Manufacturing

Knowledge

Data Bases

Knowledge

Data Bases

Model for Design

Process Planning

CAD

Feature Recognition

Model for Manufacturing

Process Detailing

Tool Path Generation

Simulation

Scheduling

Internet
Intelligent Model
FX Technology
Knowledge
Cheaper Faster Better
Model for Manufacturing
KnowledgeBased Engine
Manufacturing Functions
Scheduling
Rules Experiences Environment
Knowledge
Data Bases
Internet
GUI
Cheaper Faster Better
Using Part Types in ESPRIT

- Open KnowledgeBase Document Settings
- Select a Part Type

When features are created, they will be recognized by the KnowledgeBase and any associated machining processes will be linked to them.
The KnowledgeBase Manager

- Your gateway to automation in ESPRIT
- The KnowledgeBase Manager has links to:
  - Cutting Tools Manager
  - Technology Manager
  - Process Manager
  - Speed Feeds Manager

- Each manager lets you store information about your shop
Cutting Tools Manager

- Set up your own tool groups and the tools stored in them
Technology Manager

- Set up your own default groups and the machining preferences stored in them
Process Manager

- The Process Manager stores:
  - Part Types
    - The Feature Types that describe the Part Type
    - The Processes to machine each Feature Type
Speed Feeds Manager

- Set up your own standards and the speed/feed data stored in them
- Copy material from one standard to another or copy **all** the data in a standard

**Caution!!** Data in the CutData standard cannot be copied to another standard
Add calculated Speed Feed Data

- You can also let the KnowledgeBase calculate the speed/feed data
- Right-click in the grid and select Calculate
Graph Speed Feed Data

- You can also view your speed/feed data in a graph
- Right-click in the grid and select Graph Data
Advanced Automation Techniques

- With an advanced knowledge of ESPRIT and Visual Basic, you can fully automate certain processes using:
  - Expressions
  - Macros
  - Add-ins
2006 Automation Ratios:

![Graph showing automation ratios from 0% to 100% for different parts. The graph is divided into manual and automated sections.]
A Changing World...

"Willingness to change is a strength. Change before you have to." - John Francis “ - Jack” Welch, Jr. was Chairman and CEO of General Electric between 1981 and 2001.

“Changing established ways of working will always be a challenge, but it is one that must be faced to ensure the survival of many manufacturing businesses. The alternative is to see work going to countries that can cheaply undertake simpler and routine manufacturing operations because of cheaper labor. Others can undertake complex work more efficiently and more accurately by using the latest technology.” - Peter Dickin - Moldmaking Technology
Develop a Plan

Start by standardizing the tools, materials, processes you already have, but leave room for flexibility. You have to be able to adapt to improvements in the future.

Study which machining processes work well and find out which aspects of those processes can be used elsewhere. Analyze processes for optimal feeds and speeds.

Use the knowledge you’ve collected to set up a database of common cutting tools, part materials, optimal feeds/speeds, machining defaults and processes.

Eliminate waste throughout the entire process. Organize an evolutionary process: Constantly improve and Optimize.
Storing your shop floor information

- The simplest way to start automating is to use the ESPRIT KnowledgeBase to set up and store your common cutting tools, part materials, speeds and feeds, and machining preferences.
- Setting up your data lets you:
  - Select the correct cutting tools
  - Automatically calculate appropriate spindle speeds and feed rates based on the part material, tool material, depth of cut, and tool diameter
  - Automatically load your machining preferences on the technology page
Exceptional Customer Satisfaction

- All time High!
- 2006 -> 2007 -> 2008
  - Significant improvements in 2008

- Satisfied Customers
  - 98.8% - Functionality
  - 98.6% - Quality
  - 99.1% - Technical Support
  - 98.5% - SMC
HELP!!!!

- Standard to describe, evaluate and share Manufacturing Processes on the Web
- Searching for new Manufacturing Processes (“Google for best Manufacturing Processes”)
- Process Driven Feature Recognitions vs. Feature Driven Process Planning
- Manufacturing Processes Evolution Agents vs. User-driven Optimization Modules
- Bringing Real Time Manufacturing Knowledge back to the Design (wizards?)