PTC Acquires NC Graphics

High-Speed Precision Machining Solution Broadens Pro/ENGINEER® CAM Offerings

May 2007

PTC Acquires NC Graphics

![PTC logo]

Acquisition Details

PTC acquired NC Graphics, the technology leader in the high-speed machining market

- NC Graphics serves customers in key discrete manufacturing segments

  - **Aerospace & Defense**

  - **Automotive**

  - **Electronics & High Tech**

  - **Industrial Equipment**

  - **Medical Devices**

- Market reach is also extended through leading OEM partners

- Developer of market leading high-speed machining technology for toolmaking, prototypes and other precision machining applications

- NC Graphics solutions deliver machining toolpaths produced from existing 3D CAD data that are accurate, relevant, and precisely tailored to the needs of toolmakers

- NC Graphics is privately held, headquartered in Cambridge, UK, with 15 employees

With this acquisition, PTC is uniquely positioned to help customers optimize both the design and machining of molds, dies, prototypes and other high-speed precision applications

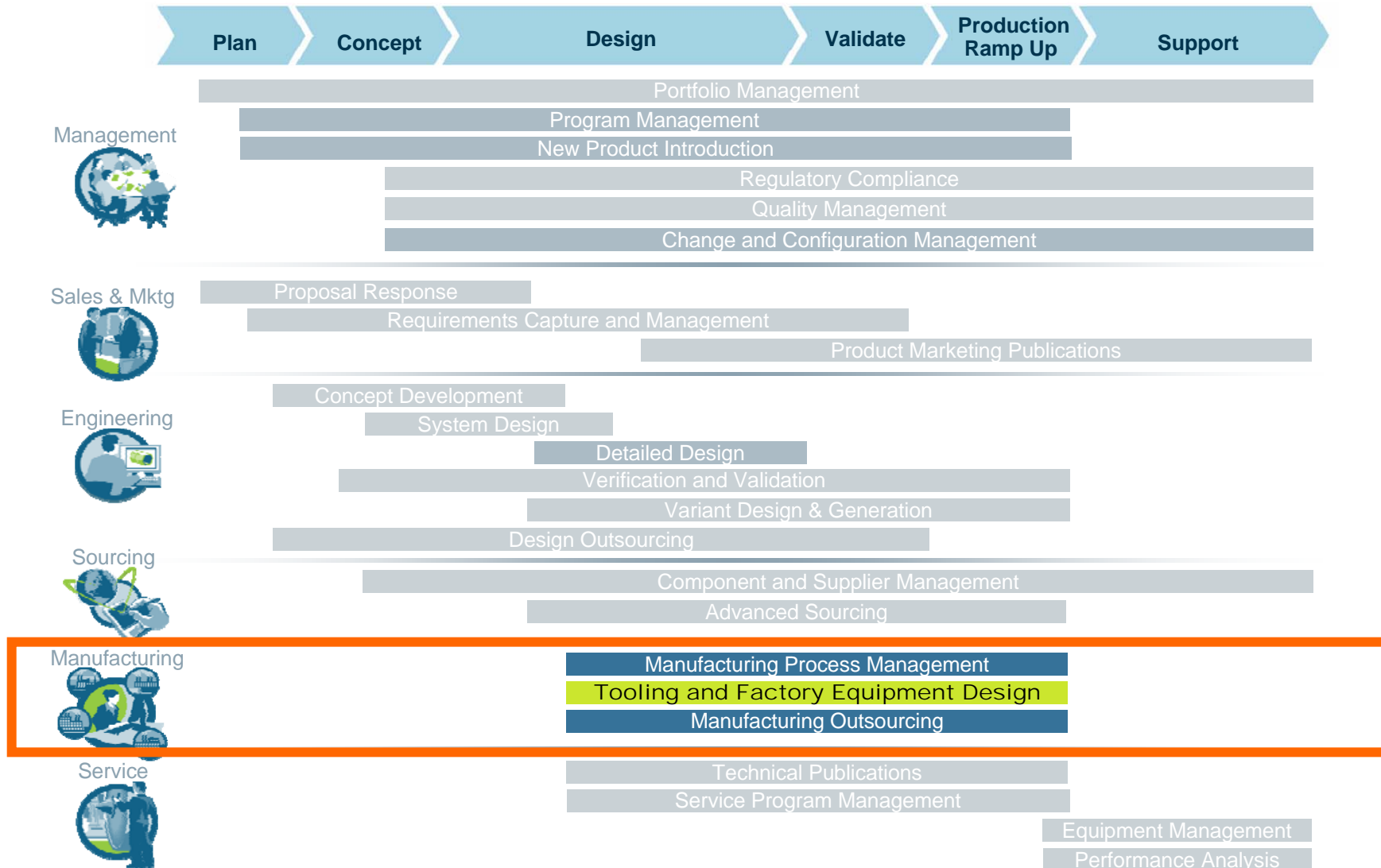# NC Graphics Fits PTC's Acquisition Strategy

Financial Fit

- Should accelerate PTC growth longer-term: CAM market leaders are growing over 20% y-o-y

  (source: CIMDATA 2006)
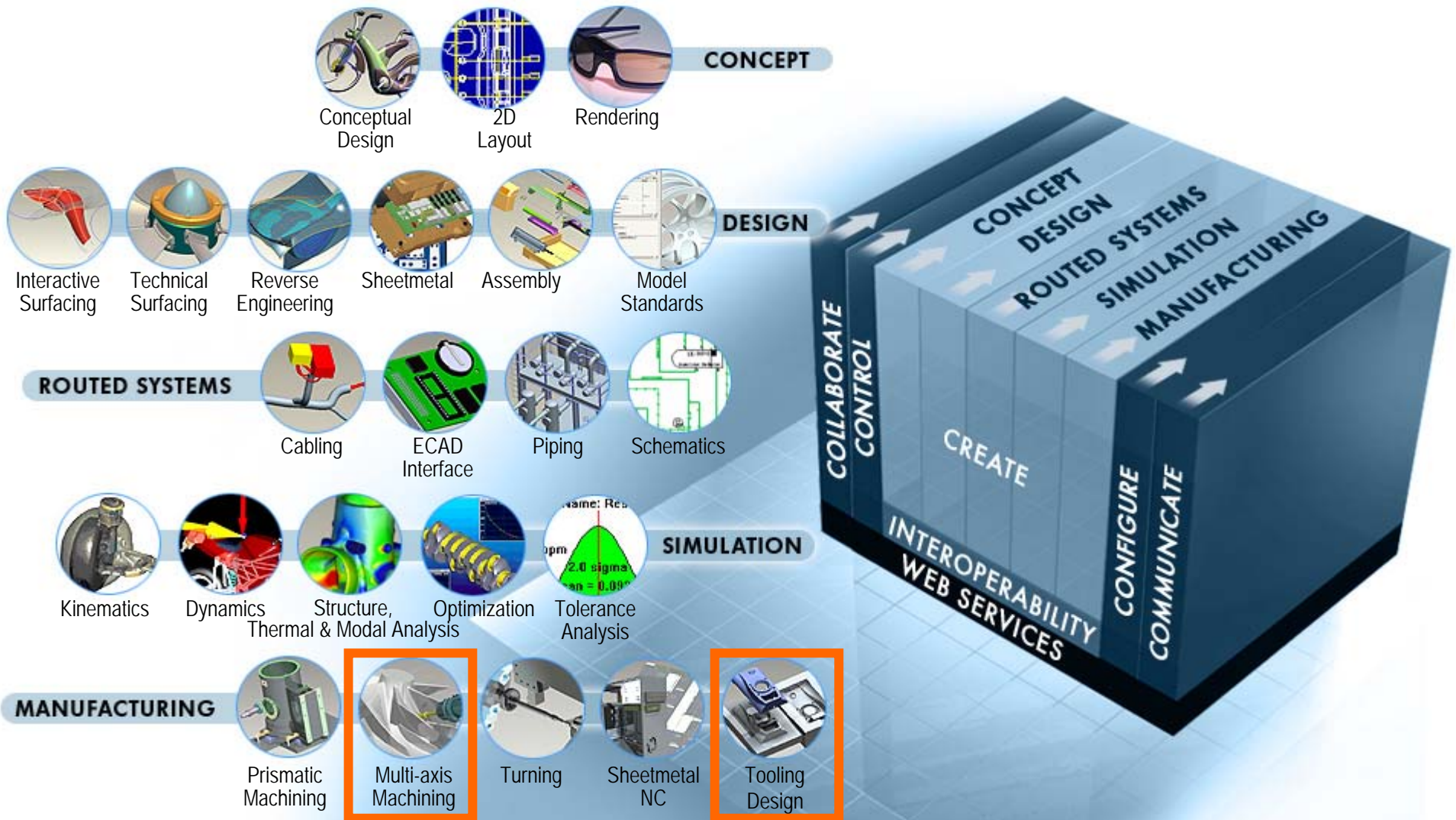
- Fairly valued

Strategic Fit

- Adds value for PTC:

  – **Strengthens PTC's Pro/ENGINEER CAM Solutions: enables discrete manufacturing customers to create high-speed precision machining toolpaths from any 3D CAD data including Pro/ENGINEER, UGS (Parasolid) and CATIA**

  – **Allows PTC to offer a best-in-class stand-alone solution**

  – **Enables the creation of associative machining toolpaths from Pro/ENGINEER 3D CAD data**

- Adds value for NC Graphics:

  – **NC Graphics customers can benefit from the tight integration with PTC solutions, driving process efficiencies previously unattainable**

  – **Leverages PTC's global development, marketing, sales, distribution and services channels to enhance NC Graphics sales and increase customer support**

The NC Graphics Acquisition Furthers PTC's Renewed Focus on CAM

Plan	Concept	Design	Validate	Production Ramp Up	Support

Management

Portfolio Management

Program Management

New Product Introduction

Regulatory Compliance

Quality Management

Change and Configuration Management

Sales & Mktg

Proposal Response

Requirements Capture and Management

Product Marketing Publications

Engineering

Concept Development

System Design

Detailed Design

Verification and Validation

Variant Design & Generation

Sourcing

Design Outsourcing

Component and Supplier Management

Advanced Sourcing

Manufacturing

Manufacturing Process Management

Tooling and Factory Equipment Design

Manufacturing Outsourcing

Service

Technical Publications

Service Program Management

Equipment Management

Performance Analysis

NC Graphics Technology Extends PTC's CAM Offerings
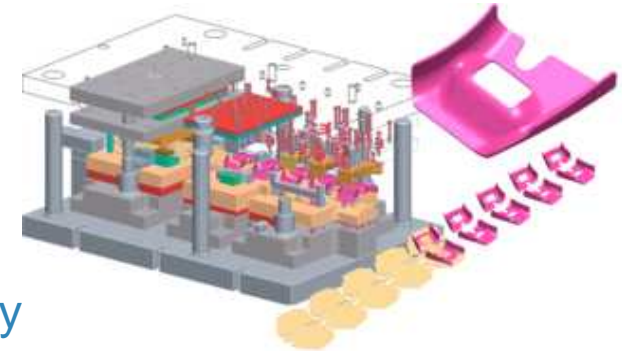
Toolmaking is Important to Discrete Manufacturers

Toolmakers create fixtures and equipment used to manufacture products

- Design and produce molds, dies, and other tools for manufacturing processes

- Quality of the end product depends on the quality of the tooling

- High-speed machining is often used to produce molds, dies, and prototypes
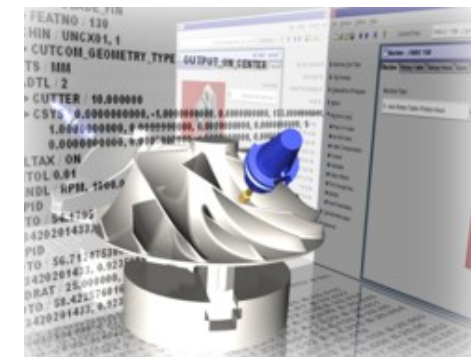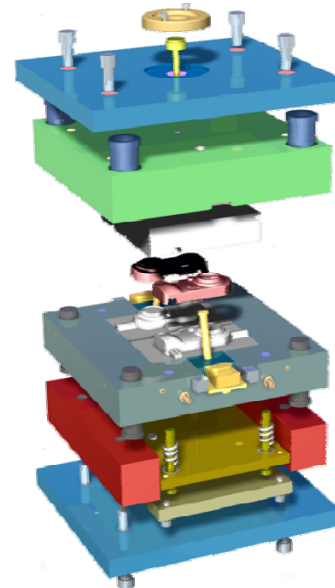
Tooling is created from CAD design data

Tooling design and manufacture is often outsourced to specialized shops

- Supporting multiple CAD systems is important for servicing different clients

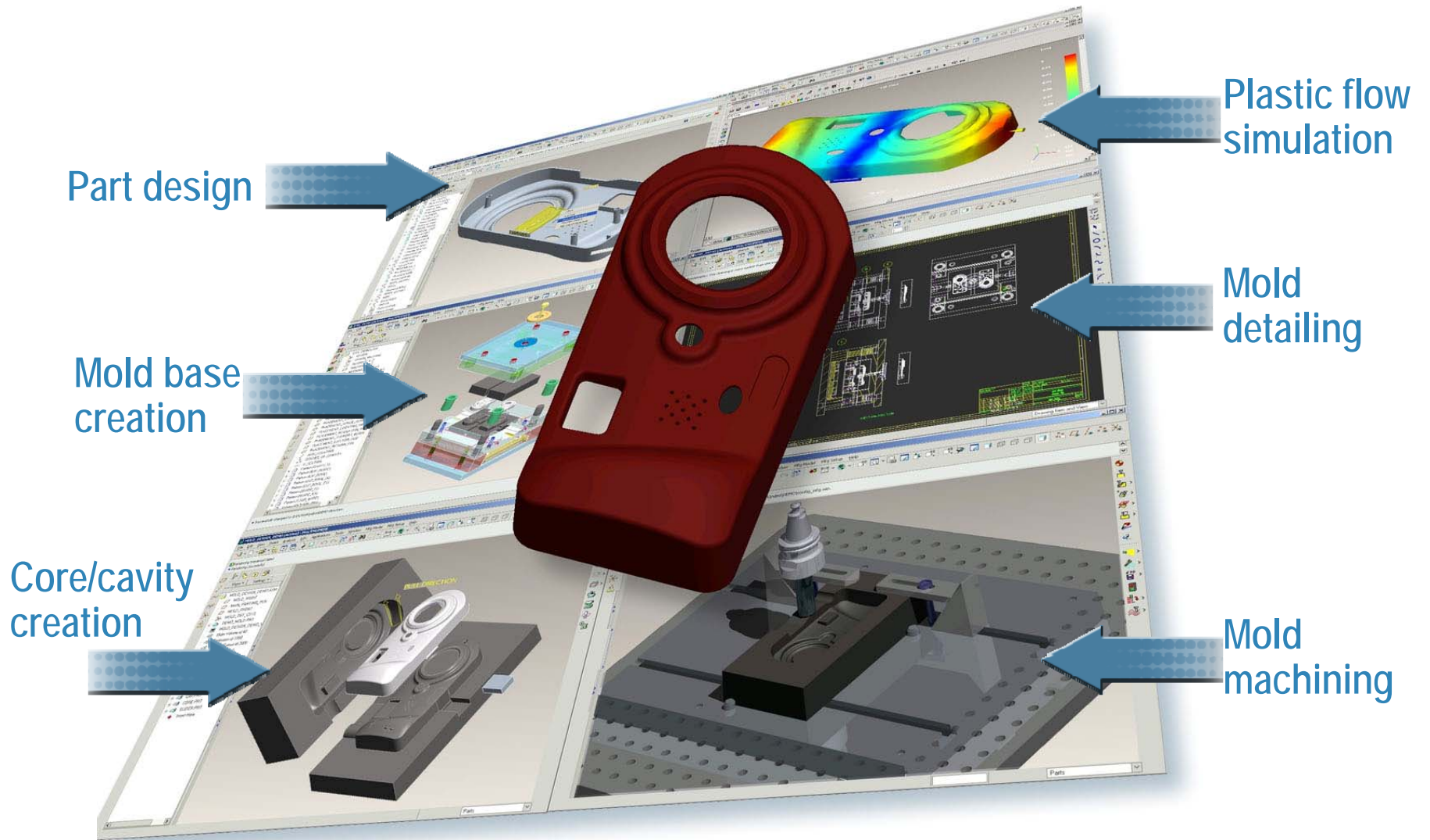- Speed and ease of use are critical to process large influx of new designs

Mold Assembly

Die Assembly

Precision Machining

Elements of Tool Design Using a Mold Example

Part design

Plastic flow simulation

Mold base creation

Mold detailing

Core/cavity creation

Mold machining

Market Trends

Trends in Manufacturing

- **Global competition**

- **Technology advances**

  - **Design, mold and machining simulation**

  - **Concurrent engineering**

  - **Multi-axis machining (5-axis)**

  - **High-speed machining**

Market Drivers for Optimizing Machining Processes

- **Time-to-market pressures**

  - **New products**

  - **Response to design changes**

- **Decrease cost by improving operational efficiency**

  - **Shorter cycle time and smaller production runs**

  - **Improve asset utilization to optimize productivity and throughput**

- **Improve quality**

- **Collaboration (globalization)**

Toolmaking: Today's Process Is Inefficient

3D Modeling → Tooling → NC Toolpaths → Tooling Manufacture → Inspection
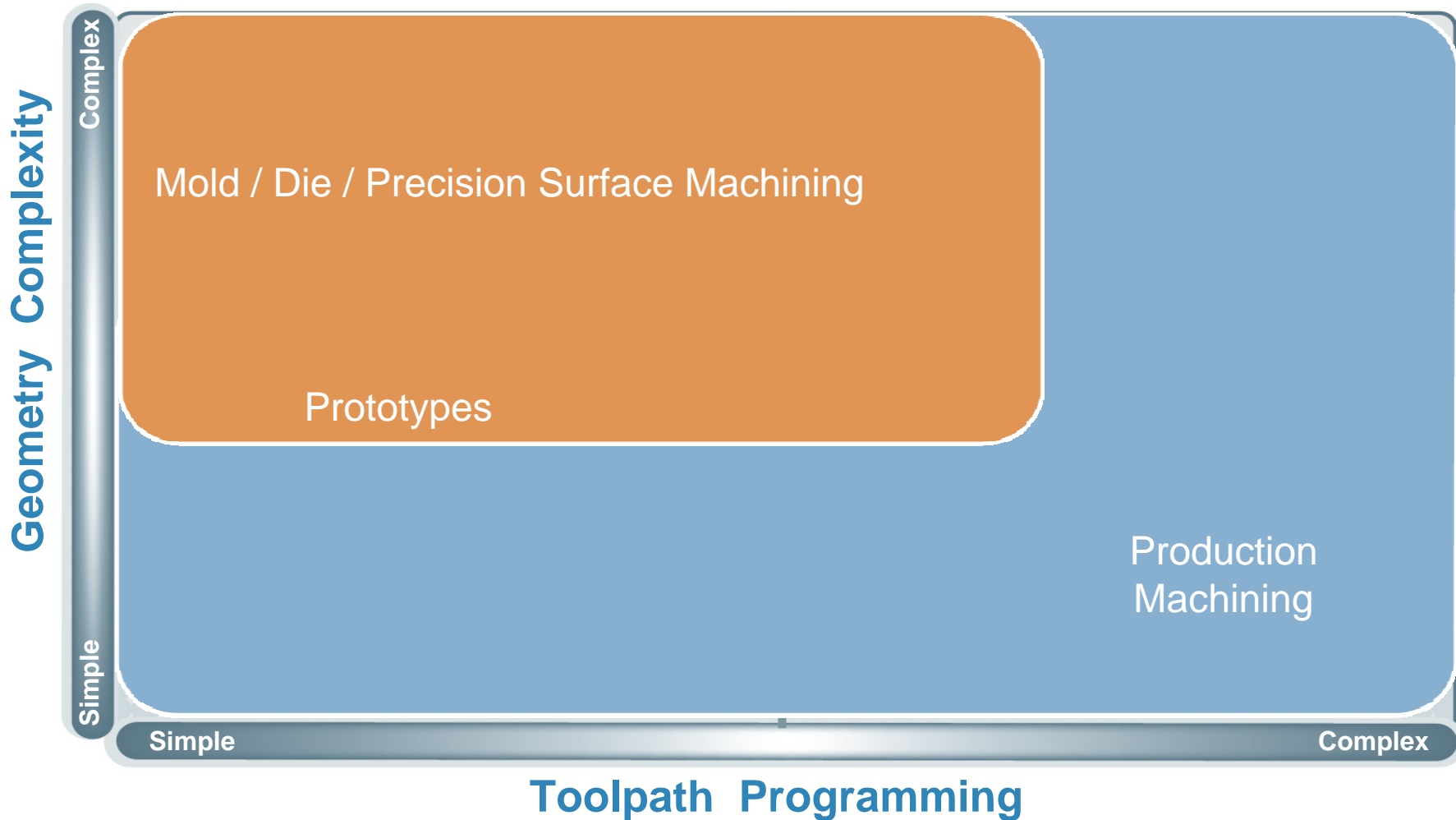
Current Process Challenges

- **Creating machining toolpaths faster**
- **Increasing complexity of shapes and parts**
- **Creating precise toolpaths to deliver high quality surface finish to avoid manual polishing**
- **Creating efficient toolpaths to decrease manufacturing time and wear on equipment**
- **Ease of use current CAM software**
- **Supporting designs created in different CAD systems**
- **Managing tooling design and NC program data**

A Better Process

- **Leverages best-in-class tool design <u>and</u> machining applications**
  - **Easy to learn and use**
  - **Automates tedious, repetitive tasks**
  - **Quickly computes the machining toolpath with little operator interaction**
  - **Supports multiple CAD systems**
- **Provides designers, toolmakers, and manufacturers secure, centralized access to tool design and machining data**

Comparison of Machining Type and Toolpath Characteristics

= PTC capabilities prior to acquisition   =New capabilities

Geometry Complexity

Complex

Simple

Mold / Die / Precision Surface Machining

Prototypes

Production Machining

Simple   Complex

Toolpath Programming

NC Graphics is the Leader in High-Speed Machining Technology

Founded in 1977

Industry Leadership

- NC Graphics provides best-in-class special-purpose high-speed precision machining software

- NC Graphics technology is licensed to 5 of top 10 CAM vendors- including CNC Software, makers of Mastercam
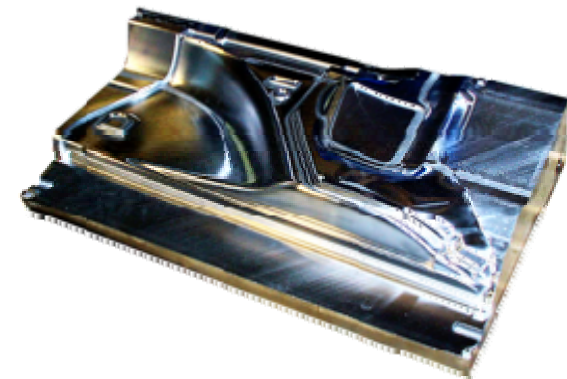
Solid, global customer base representing discrete manufacturers and specialized tooling companies serving industries such as

- Aerospace & Defense, Automotive, Electronics & High Tech, Industrial Equipment, and Medical Devices

Strong VAR channel and OEM relationships in key markets

- Japan, Germany, Pacific Rim

# 30 years of Customer Success – NC Graphics Core Verticals

Aerospace/ Defense	Automotive Products	High Tech/ Electronics	Industrial Products	Medical Products
Avalon Plastics Ltd	Ford	ADRECO LTD	EUROMOULDS	INVICTA WORLD CLASS BY DESIGN
C² COMPOSITES	SUZUKI	DAEIL MOLDS	MICRO MATIC	L.P.S ENGINEERING
DIECAM PRECISION COMPONENTS	TOYOTA	FUJITSU	KEIRON MOULD TOOLS Ltd	PH
GALTEC	INTIER Automotive	NPE innotek	Modern Moulds & Tools Ltd.	The Royal Orthopedic Hospital
TRITEC	schefenacker	MODEL PATTERNS	PLAYDEN TOOLS LTD toolmakers	
INCA Tooling Ltd.	racing technologies norfolk	TOSHIBA	SHARP INTERPACK	Stanmore Implants
smpp	The Di-Spark Group	TWM DIE TOOLS	pdc precision engineers	SOVRIN PLASTICS
		WG TOOLING		SYMMETRY Medical Inc.

NC Graphics - Product Overview

## NC Graphics leverages the latest cutting tool and CNC machine technologies

- First launched in 1997

- Developed in collaboration with DEPO Machine
  a leading German manufacturer of high speed milling machines
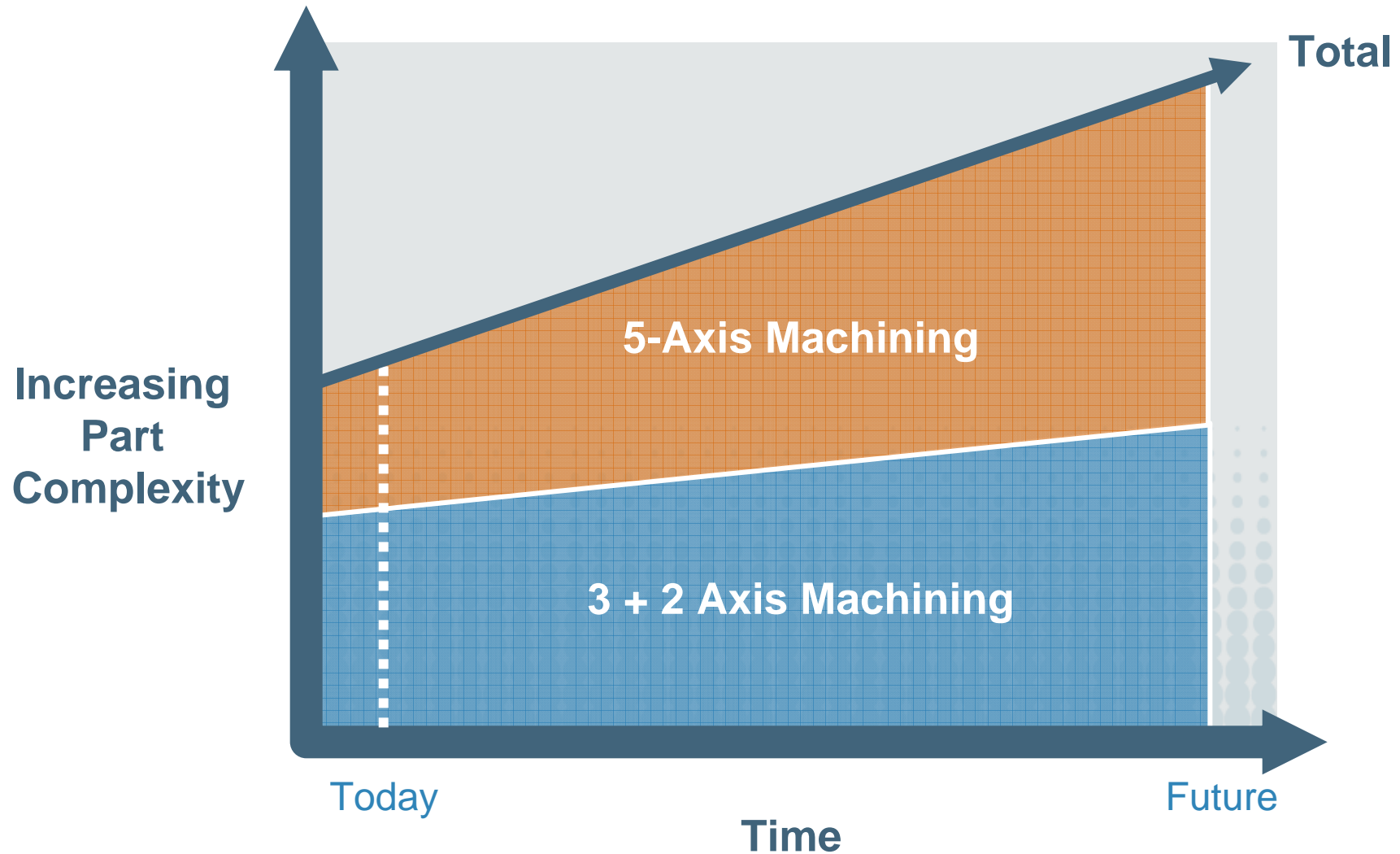
- Based on more than 30 years of CAM experience
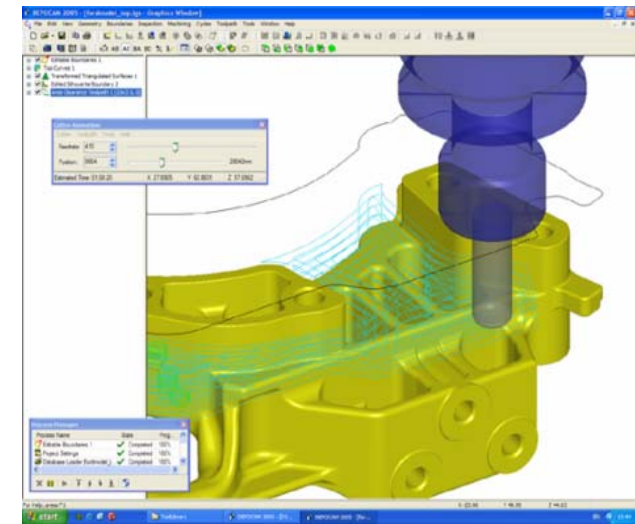
NC Graphics' solution is a stand-alone application

- Windows-based

- Easy to use

  – Shop floor oriented

  – One-day training

- Fast and reliable
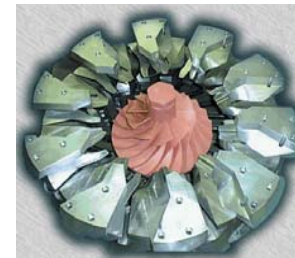
NC Graphics Helps PTC Solve Today's Challenges And Tomorrow's

Total

Increasing Part Complexity

5-Axis Machining
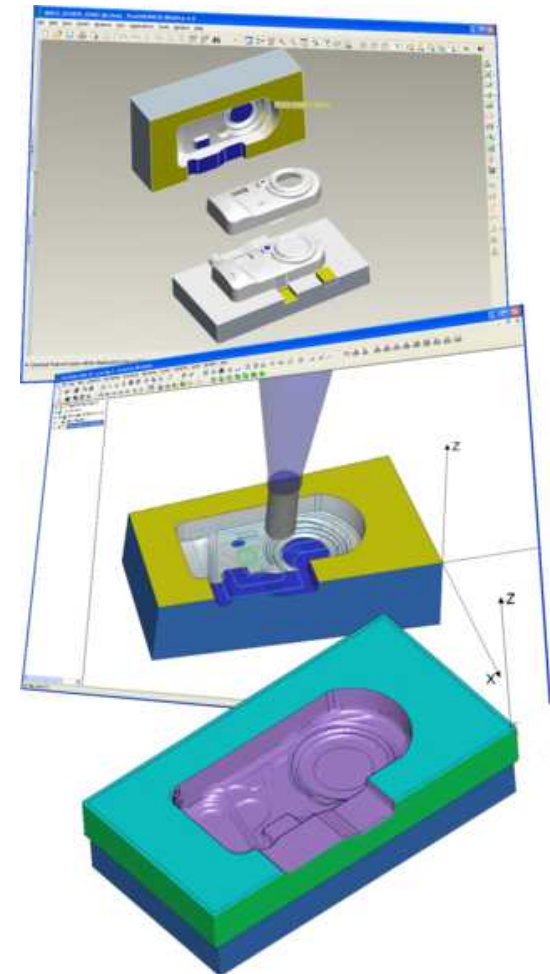
3 + 2 Axis Machining

Today

Future

Time

On the Horizon: 5-axis High-Speed Machining Technology

- 5-axis technology
  - Very fast, new technology
  - Focus on automation for toolmaker
  - Knowledge of remaining material
  - Automatic 5-axis machining : converts 3-axis toolpaths to 5-axis

- 64-bit support
  - Improves handling of large models and addresses memory limits

- GRANITE integration
  - Provides associativity to Pro/ENGINEER CAD designs

- PDS integration
  - Windchill®

- New PTC product branding
  - Pro/TOOLMAKER™
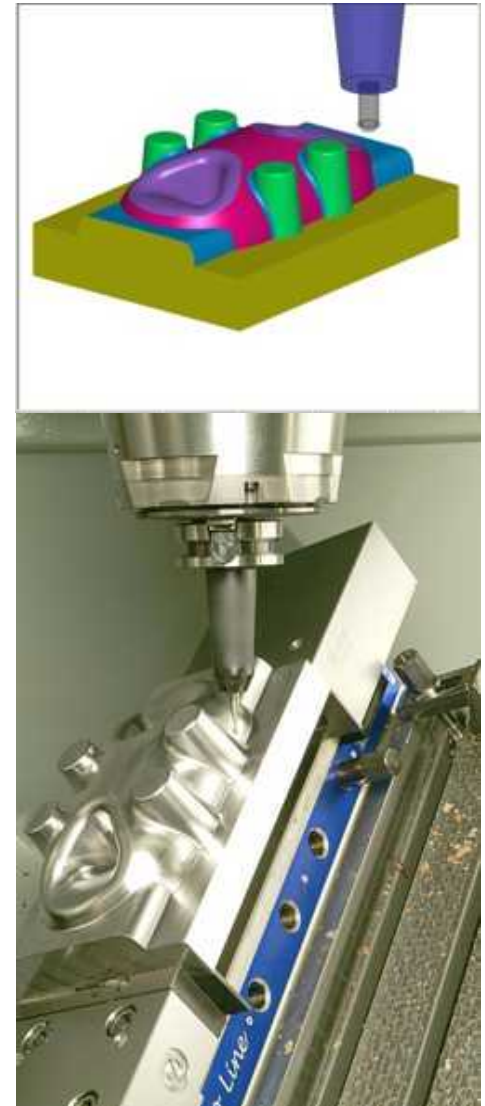
PTC is Uniquely Positioned to Optimize Toolmaking Processes

- Traditional toolmaking processes are inefficient

- NC Graphics' solutions revolutionize the way companies create and deliver high-speed precision machining toolpaths

- NC Graphics is complementary to our existing solutions and extends the value of Pro/ENGINEER CAM software and service offerings

- PTC extends the value of NC Graphics solutions and is committed to offering a stand-alone solution

- PTC's strategy is to remain open and work with a variety of CAD systems

- Combining NC Graphics' mastery of high-speed precision machining with PTC's expertise in 3D design and associative content will provide a powerful, solution for toolmaking

Q&A