# Using CAD/CAE Early in the Design Process

## Aug 5th, 2008

## Design Automation Conference, Brooklyn NY

PHOENIX INTEGRATION

www.phoenix-int.com

# Phoenix Integration

- 1995 Virginia Tech spinout
  - Software and services for aerospace, defense, and related industries
- Office locations
  - Philadelphia, PA (Corporate)
  - Blacksburg, VA (R&D)
  - California (Sales)
  - North East (Sales)
- World-wide sales in North America, Europe, and Asia
- ~30 Employees
  - 5 Ph.D.
  - 5 MS

PHOENIX INTEGRATION


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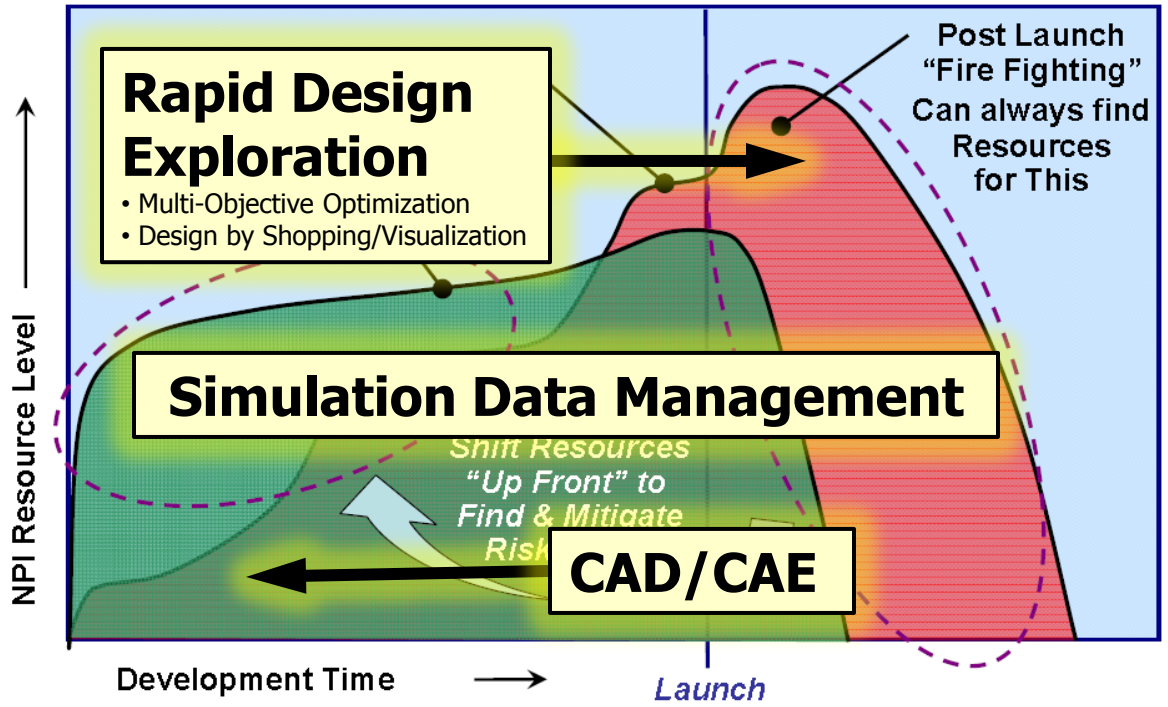
Motorola

CPDA PLM ROAD MAP 2007

# Product Development Resource Redistribution

*Resources Shift for Proactive, Predictive Product Development*



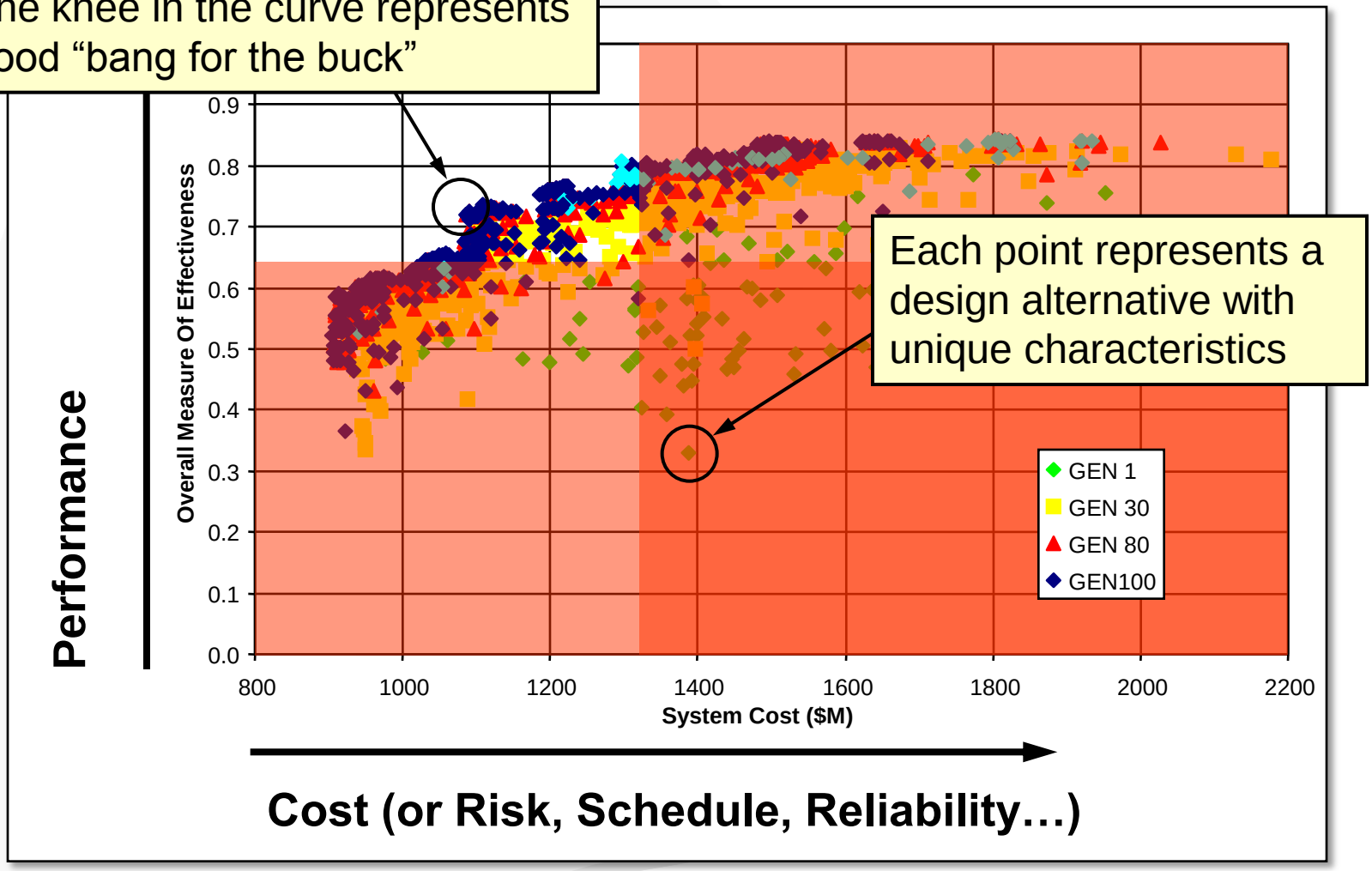




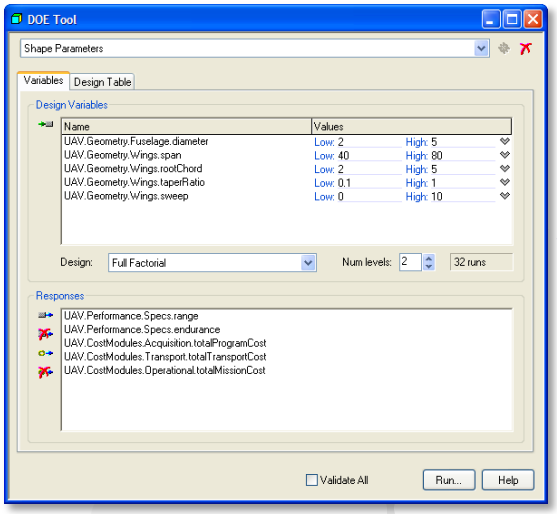

MOTOROLA

# Comparing Alternatives

The knee in the curve represents good “bang for the buck”

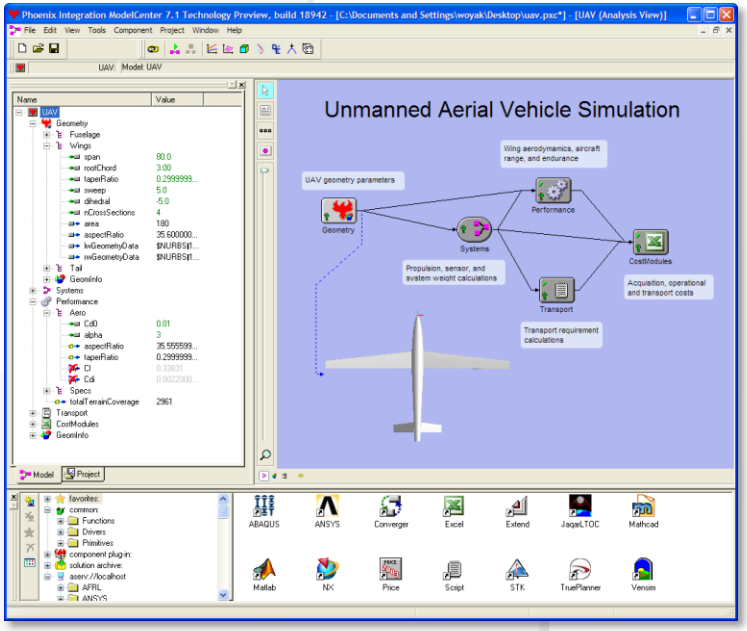


# ModelCenter

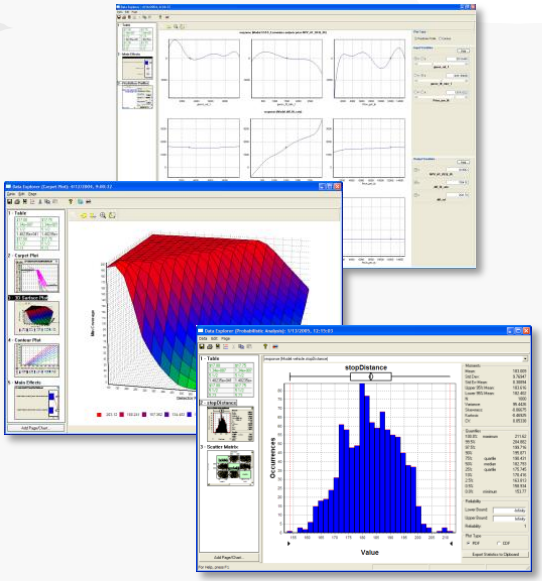



**Design of Experiments**

Run Matrix




**ModelCenter**




**Sensitivity Analysis**
**Parameter Scans**
**Optimization**
**Risk Analysis**

AIRBUS
ATK
BAE SYSTEMS
BOEING
CSC
DLR
LOCKHEED MARTIN
NASA
NAVSEA
NAVAL SEA SYSTEMS COMMAND
NORTHROP GRUMMAN
ONERA
THE FRENCH AEROSPACE LAB
Orbital
Pratt & Whitney
A United Technologies Company
Raytheon
SAIC
Sikorsky
A United Technologies Company

# Future Perspectives

- Fidelity Forward Design
  - Use simulation to prevent problems
  - Seamless integration of CAD/CAE during conceptual design
- Data Management
  - Scaleability
  - Knowledge retention
  - Collaboration

# It All Started Here!

Woyak, S. A., Malone, B., and Myklebust, A., "An Architecture for Creating Engineering Application: The Dynamic Integration System," *Proceedings of the* ***Computers in Engineering Conference*** *and the Engineering Database Symposium, ASME, September 17-20, 1995, Boston, MA, pp. 1-8.*