



1998 International ADAMS User Conference  
Welcome Address




**Welcome Address**  
The Reality of Virtual Prototyping

*Robert R. Ryan*  
President &  
Chief Operating Officer



**Opening Remarks**

- Welcome
- The Virtual Prototyping Market
- Brief Update on Mechanical Dynamics, Inc.
- Conference Overview



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## Virtual Prototyping - A Reality

"The adage that you should never buy a car its first year out could be dying of old age and new technology."

- Detroit Free Press, 6/4/98

"...The Concorde's performance is especially noteworthy, given the Concorde's development process, which relied heavily on virtual design and very little on clay modeling and physical prototypes."

- J.D. Power and Associates

Initial Quality Study of 1998 Models

Navigator



Entirely new vehicles win J.D. Power's "Best in Segment" Awards  
in Initial Quality Study



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## Introducing the New Beetle - Designed with ADAMS



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## Facing Aircraft Design Challenges with Virtual Prototyping



*"The goal is to go from 60-some months to 12 and to do what we did last time around for \$6 or \$7 billion, for \$1 billion."*

Ron Woodard,  
President of Boeing, Commercial Airplane Group



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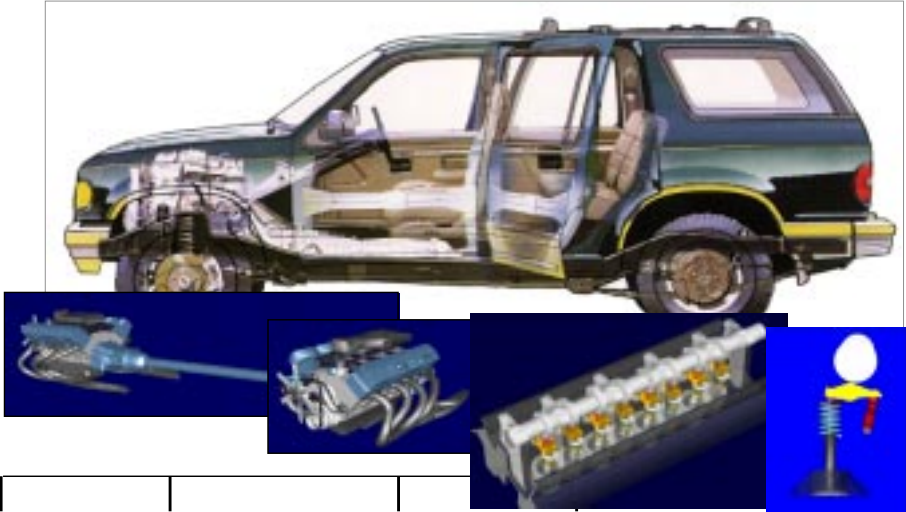
## Winning through Virtual Prototyping



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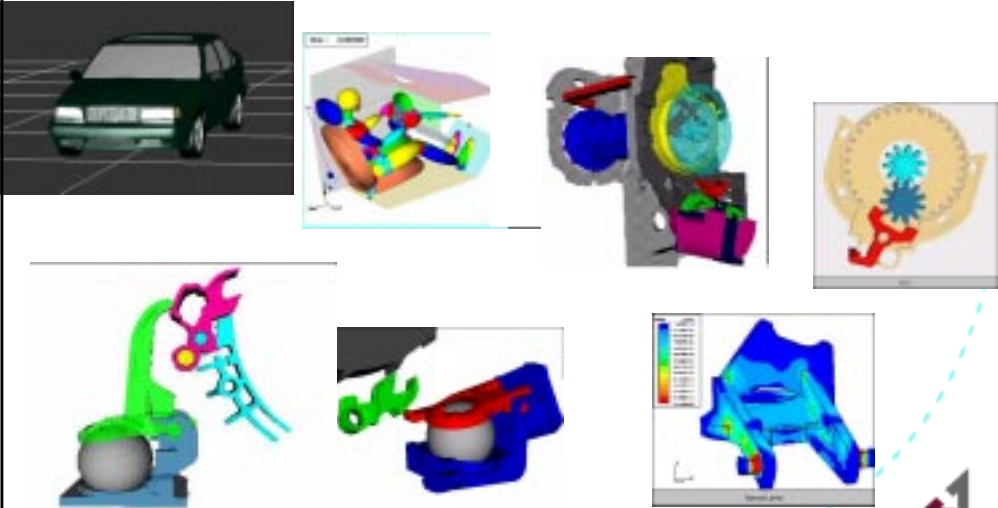
## Driving Modular System Design



Valve      Camshaft      Rocker Arm      Spring      Timing Chain

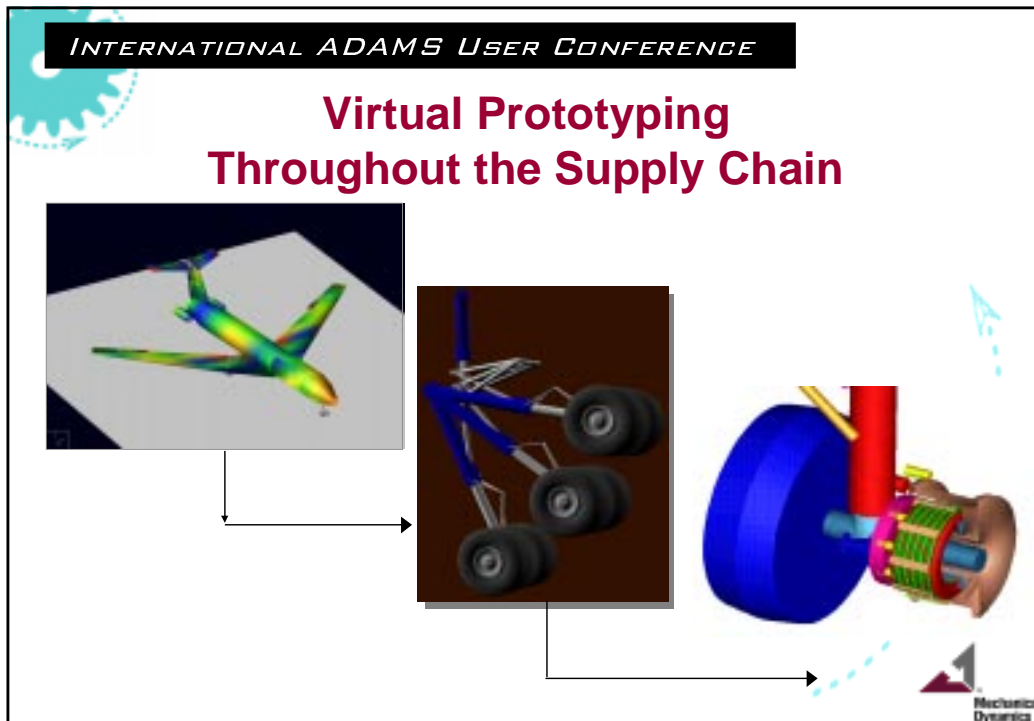
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## Virtual Prototyping Supply Chain



Mechanical Dynamics

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### Opening Remarks

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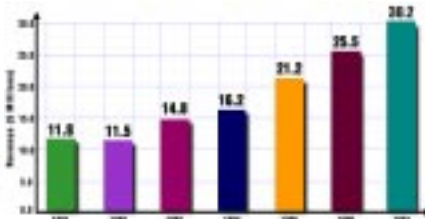
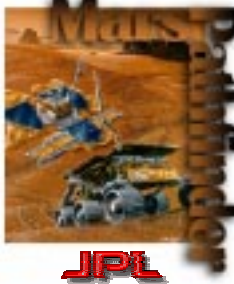
Mechanical Dynamics

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## The Year in Review

- Historic customer accomplishments
- Record corporate revenue
- Public recognition
- Acquisition
- Growth



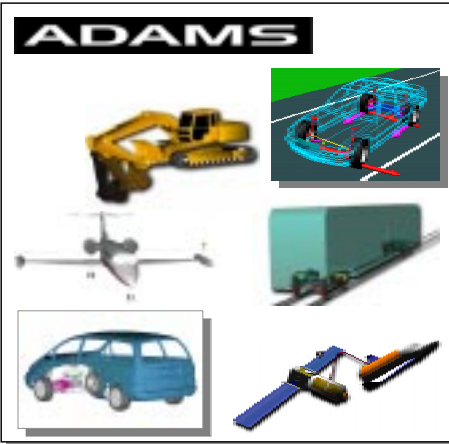


| Year | Percentage of Companies |
|------|-------------------------|
| 1991 | 11.8                    |
| 1992 | 11.5                    |
| 1993 | 14.8                    |
| 1994 | 16.3                    |
| 1995 | 21.2                    |
| 1996 | 25.5                    |
| 1997 | 30.2                    |



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## Expanded Product Lines







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## ADAMS Drives Virtual Prototyping

- Build
- Test
- Validate
- Refine
- Optimize
- Automate






*Simplicity Speed Power Parametrics Proven*




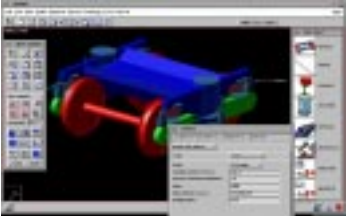

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## Application-specific Products

**ADAMS/Car** **ADAMS/Pre** **ADAMS/Tire**



**ADAMS/Driver** **ADAMS/Rail**



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### CAD-Embedded Solutions



SDRC

EDS

DASSAULT SYSTEMES

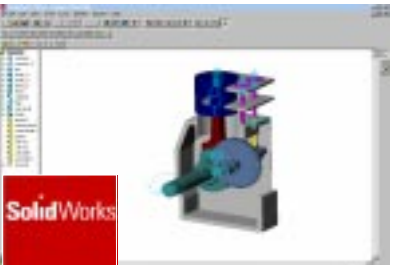
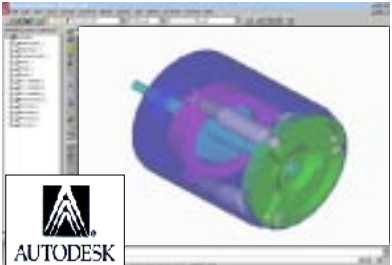

PARAMETRIC TECHNOLOGY CORPORATION

ADAMS

Mechanical Dynamics

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### CAD-Embedded Solutions



BENTLEY

AUTODESK

SolidWorks

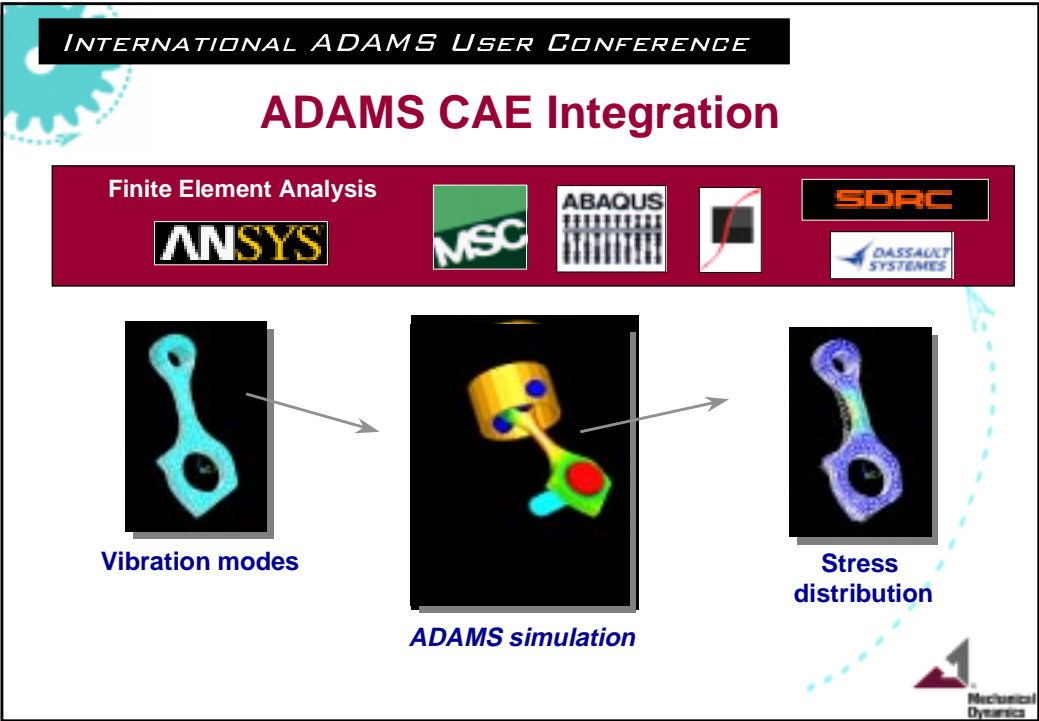
DYNAMIC DESIGNER

ADAMS

Mechanical Dynamics



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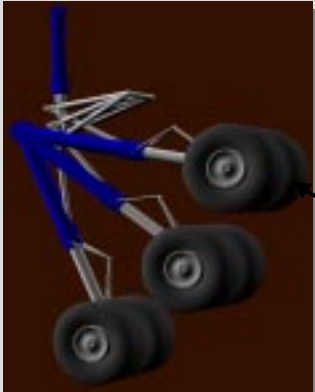
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## ADAMS CAE Integration

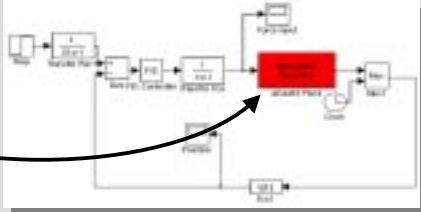
Controls System Modeling

**BOEING**  

**Mechanical System Simulation**




**Control System Design**




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## Design-oriented Interoperability

- Posts Web-based VRML product animations
- Uses OLE to communicate with Microsoft Office products
- Employs mechanism design wizards
- Navigators speed modeling and simulation



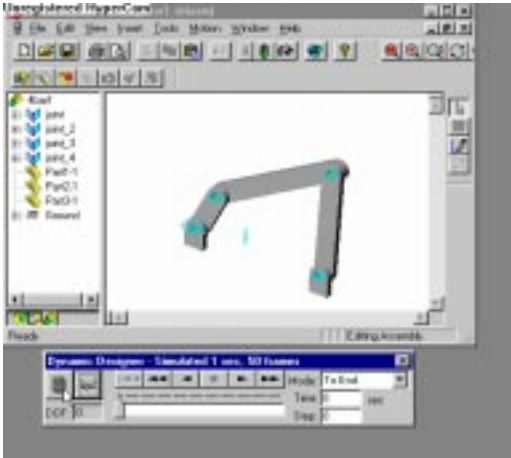


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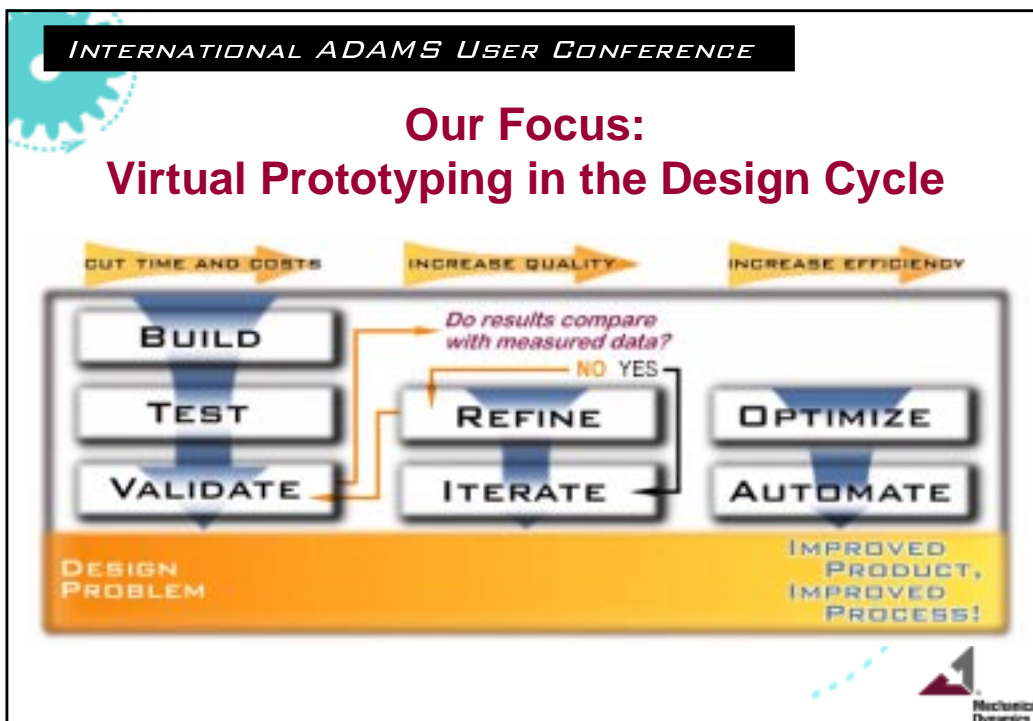
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Mechanical Dynamics




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### The Road Ahead 1998 and Beyond



**Smarter to Market**  
The Virtual Prototyping Advantage




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### 1998 Conference Activities

- Presentation of Technical Papers
- Exhibitions & Displays
- Events
- Informal Meetings with Colleagues and MDI Staff



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### Presentations

- Applications
  - ◆ Vehicles, Engines, Transmissions,
  - ◆ Aircraft, Landing Gears, Brakes, Missiles, others
- Technology Areas
  - ◆ Flexibility, Modal Analysis, Vibrations
  - ◆ Automatic Controls, Hydraulics
  - ◆ Surface Contacts, Collisions
  - ◆ Synthesis & Analysis
  - ◆ CAD Conceptual Design & Assembly
- Representation
  - ◆ North America, South America, Europe, Asia







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## Exhibits & Displays

- Industry Applications
  - ◆ **Automotive** ( ADAMS/Car, ADAMS/Pre, Frequency-dependent bushing tools)
  - ◆ **Aerospace**
  - ◆ **Tracked Vehicles**
- CAD Integration
  - ◆ **PRO/E, CATIA, Unigraphics, I-DEAS**
  - ◆ **AutoCAD, SolidWorks, MicroStation**
- CAE Technology & integration
  - ◆ **Flexibility** (ADAMS/Flex and integration with MSC/Nastran, ANSYS, and Abaqus)
  - ◆ **Controls** (ADAMS/Controls and integration with MATLAB, MATRIXx, and EASY5)
  - ◆ **Fatigue & Durability** (Integration with nCode and LMS Durability Software)



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## Events

- MDI/SGI Golf Outing
  - ◆ Monday, June 8, Reddeman Farms Golf Club, 9 AM - 2 PM
- MDI/Sun Microsystems Whirlyball & Pizza Party
  - ◆ Monday, June 8, Ann Arbor Whirlyball, 7-10 PM
- IBM Keynote Presentation
  - ◆ Global Automotive Industry in Transition, Mike Lalande
  - ◆ Tuesday, June 9, Main Conference Hall
- MDI/Sun Luncheon
  - ◆ Tuesday, June 9, Lobby Area
- MDI/HP Sports Night
  - ◆ Tuesday, June 9, WCC Lawrence Building, 5-8 PM
- MDI/SGI Luncheon
  - ◆ Wednesday, June 10, Lobby Area



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