Automotive Product Development
Framework Overview

Douglas P. Glasson
Department Research Analyst

June 4, 1997
Automotive Product Development Framework

Information Kernel
- Geometry
- Vehicle Characteristics
- Configuration Tracking

Concepts

Virtual Review Center

Product/Process Design Domains
- Survivability
- Quality
- Mobility
- Design/Manufacturing
- Crew Station/Vetronics

Datasets
- Baseline Data
- Proposed Updates

Operational Evaluation
- JSIMS
- Synthetic Theatre of War

Simulation-based Evaluation
- Guid
- Dyn
- Comp

Enterprise Network
- PM Office
- Subsystem Supplier
- Integration Contractors

Operational Metrics
- Engineering
- Parametric Models

Baseline Data
- Engineering
- Operational Metrics

Operational Metrics
- Virtual Proving Ground

Virtual Proving Ground
- 20° BANK
- SKIDPAD
- 15% GRADE

TASC
Why APDF?

• Areas addressed are critical bottleneck in exploiting simulation for DoD acquisitions and commercial product development
• Estimated that engineers in industry spend approximately 30-60% of their time looking for product design information: A non-value-added activity that would yield substantial savings if reduced
• Improved communication, alone, has yielded 40-60% design cost reduction by reducing design rework
• Increased emphasis on interaction among customers and integrators in both DoD and commercial enterprise
• Increased need for partnering in both DoD and commercial enterprise
Key Technical Issues for APDF

- **Data exchange**
  Interoperation among heterogeneous design packages

- **Configuration/Data Management**
  Maintain Product Design Goals
  Manage Information Flow:
  - Who is impacted by a change?
  - By how much?
  - Which parties need to negotiate?

- **Prediction Tool Integration**
  Provide an accessible suite of performance prediction tools
  Exploit remote computing assets
Accomplishments/Plans

FY1996 ACTIVITIES

Data exchange
- Designed export/reconstitution approach based on surface modeling standards and relational geometric language
- Applied export/reconstitution approach to M1A1 surface model

Configuration/Data Management
- Developed notional architecture integrating requirements management, product data management, and design coordination (uses ARC coordination matrix representation)
- Developed a small-scale prototype for an illustrative example (ripple effect of turret geometry on servo dynamics and signature)

Remote Asset Access
- Supported application of TACTICS technology to Integrated Helicopter Design Tools (IHDT) and Battle Lab Reconfigurable Simulator (BLRSI) programs
- Initiated remote supercomputer activities with U of M and U of Alaska

FY 1997 ACTIVITIES/PLANS

- Extend Data Exchange concept to export/reconstitution of NURB surfaces among 2-3 Design packages
- Develop Remote Asset Access capabilities, including web technologies, with university partners
- Industrial partnerships in development