

# PLM Forum Göteborg, May 30th, 2006

## CAA V5 Program: Open for Innovation

*"A strong partner ecosystem built on a powerful open platform, providing scalable levels of integration and openness to meet all market needs."*

**Nathalie Neusius,**  
PLM Competence Center, Dassault Systèmes

**Michael Moser,**  
Corporate Marketing, Dassault Systèmes

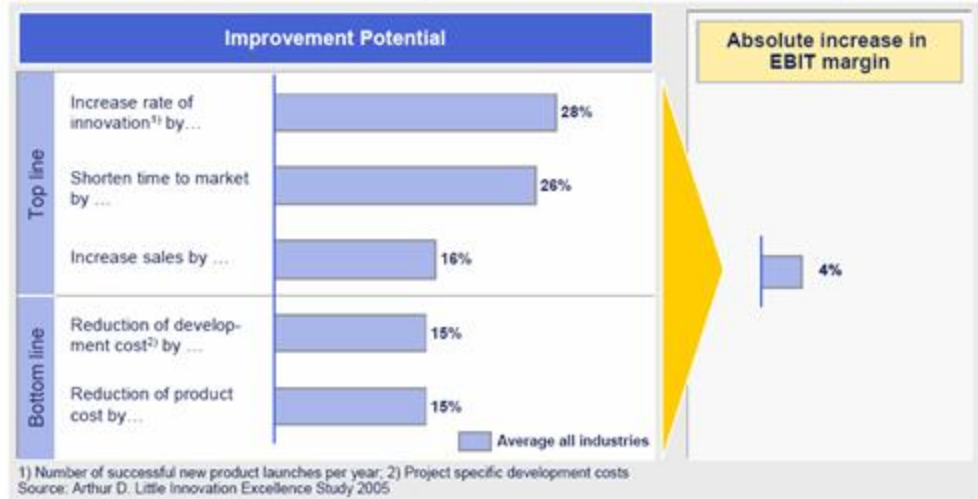


# „Innovators are Winners“

„*Innovation Excellence Study 2005*“  
**Arthur D Little**, *Technology and Innovation Management*

## ■ Business Benefits from Innovation:

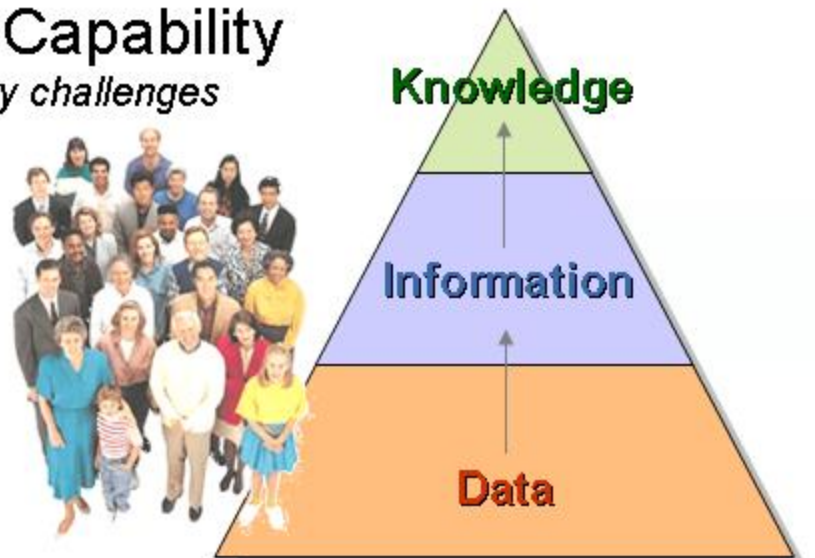
- Innovation rate
- Revenue from new products
- Time-to-market
- Dev'cost reduction
- Product cost reduction
- EBIT increase



## Openness supports the Innovation Capability

... and is becoming a strong requirement to meet industry challenges

- Support customer-specific processes
- Integrate enterprise and legacy applications
- Customize - for security or usability reasons
- Share, exchange and extract information
- Work together as a global team
- X-Collaboration



# Dassault Systèmes' Vision



Enable people to *create innovative products* and simulate the *Whole Product Life Cycle* to preserve the environment for the future



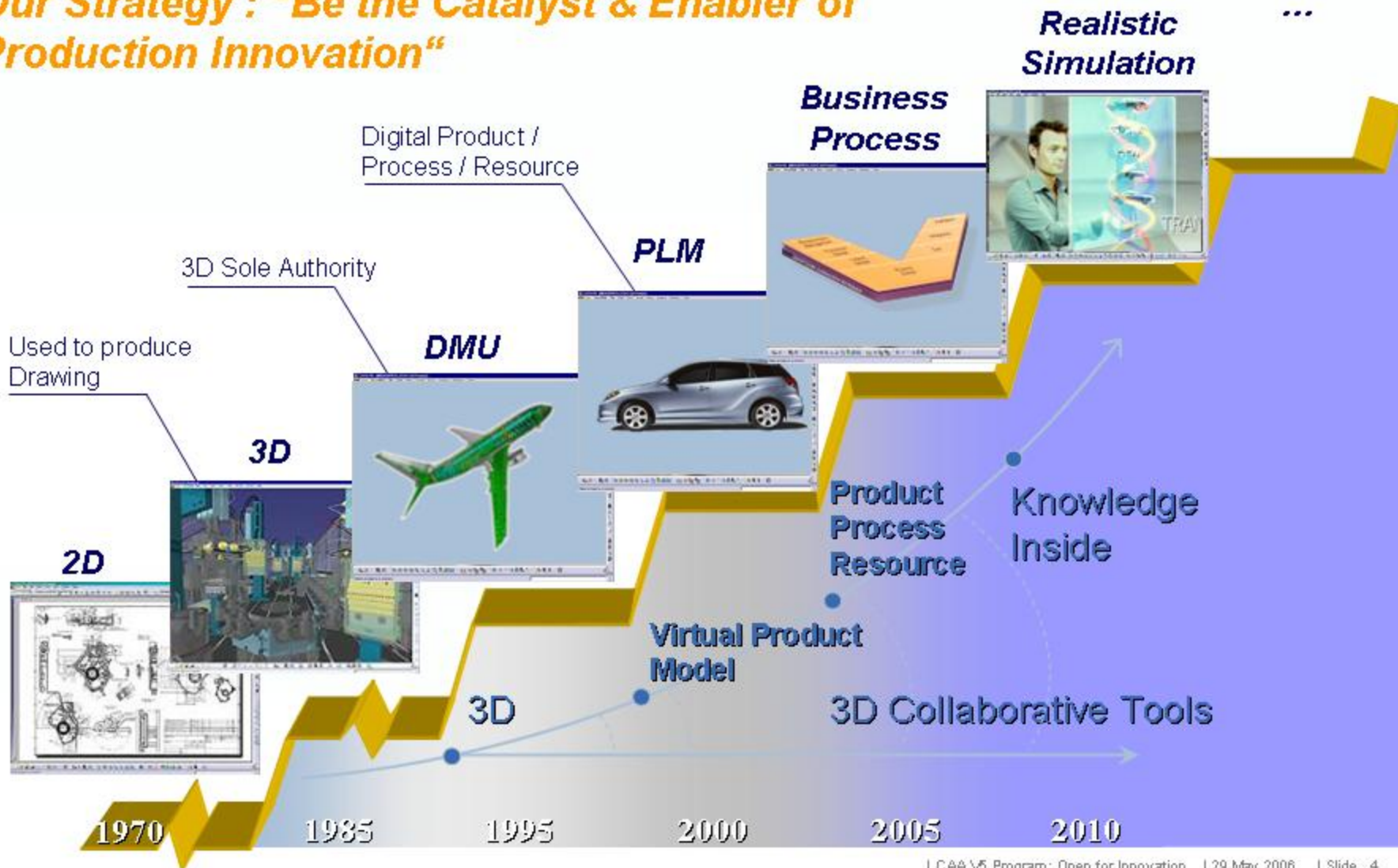
*3d* to Communicate  
Knowledge To Understand





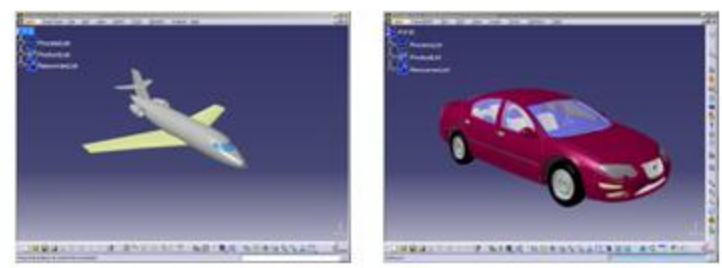
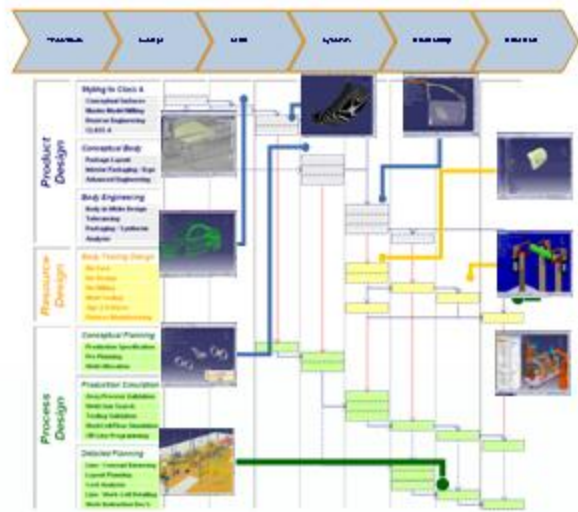
# PLM : Industry Business Transformation

**Our Strategy : "Be the Catalyst & Enabler of Production Innovation"**



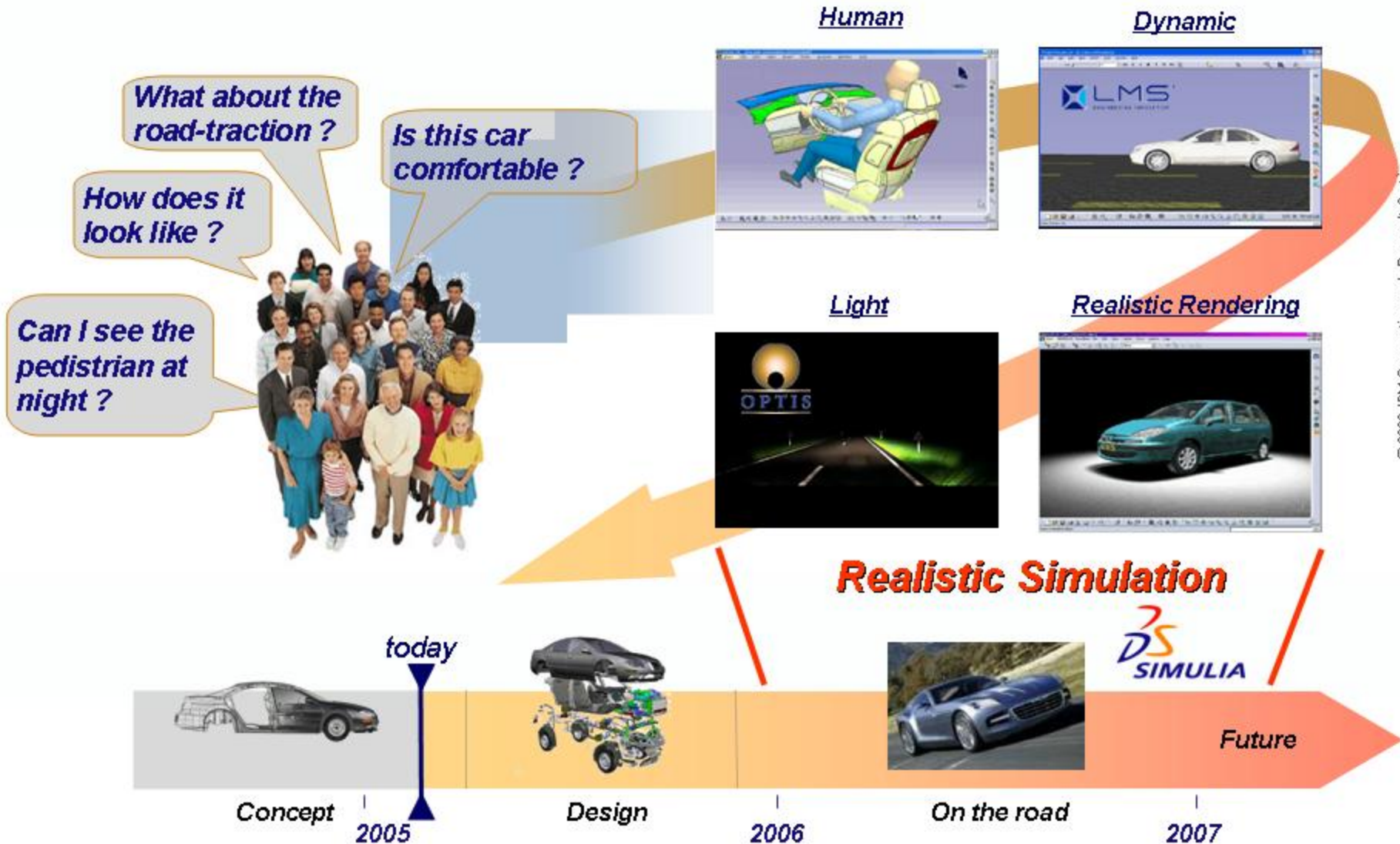
# V5 PLM Fundamentals

- Single User Interface
- Common PPR Model
- Process-oriented Applications
- Open Standards





# Customers experience the Future



# Realistic Simulation ... built on a Common Open Platform

**LMS** ENGINEERING INNOVATION    **MSC SOFTWARE** SIMULATING REALITY    **FLUENT** The Right Answer in CFD  
**Samtech**    **no0sis**    **FLOWWORKS**  
**CD-adapco**    **ESI GROUP** THE VIRTUAL TRY-OUT SPACE COMPANY    **Altair Engineering**    **OptiStruct**  
**Fi FORMING TECHNOLOGIES INCORPORATED**    **ICEM CFD**    **OptiStruct**  
**cfdesign** Upfront CFD    **OPTIS**    **FiatLux**  
**MotionAnalysis**    **D-adapco JAPAN**  
**AUTOFORM** ...    **ABAQUS**  
**CATIA**    **DELMIA**

CAAV5  
BASED

**DS**  
**SIMULIA**

Open Scientific Platform

**DS**  
**ENOVIA**

**IBM** Information Management Software    **WebSphere** software    **Tivoli** software    **Lotus** software    **Rational** software  
**.net**    **Windows**    **Windows Server System**    **Microsoft Office**

**DS**  
**SMARTEAM**



# V5 PLM Innovation enabled by the DS Ecosystem



**ASAP**  
ASSOCIATION OF STRATEGIC ALLIANCE PROFESSIONALS

**News Release**

FOR IMMEDIATE RELEASE

Contact: Media Contact: Melinda Parsons  
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**ASSOCIATION OF STRATEGIC ALLIANCE PROFESSIONALS (ASAP) PRESENTS ITS 2006 'ALLIANCE EXCELLENCE AWARDS' TO BRITISH TELECOM, PLC, DASSAULT SYSTEMES, HP-MICROSOFT AND SPRINT-CISCO**

**BOSTON, Feb 27, 2006** – The Association of Strategic Alliance Professionals (ASAP) announced the presentation of its global 2006 ASAP Alliance Excellence Awards to British Telecom, plc, Dassault Systemes, Hewlett-Packard Company-Microsoft Corporation, and Sprint-Cisco Systems. The awards ceremony, during the Association's Alliance Excellence Awards Dinner, followed the annual competition and was a highlight of ASAP's 8<sup>th</sup> Global Alliance Summit held at the Westin Buckhead, Atlanta, Feb. 13-15. The 2006 Alliance Summit Sponsors were CA, Cisco Systems and Eli Lilly and Company (Platinum) and Boehringer-Ingelheim Pharmaceuticals (Silver).

The awards recognize and celebrate companies that have achieved dramatic success in their alliances. This year ASAP presented awards in two categories – Alliance Program Excellence and Individual Alliance Excellence. Alliance Program Awards went to Dassault Systemes and British Telecom, plc, to acknowledge their systematic approaches to forming and managing their broad portfolios of significant alliances. Dassault has built its entire business model on leveraging external partnerships to create and deploy world-class capabilities. IT management, recognizing its need to adapt quickly in a dynamic environment, made a strong commitment to build out its alliance capability over the past four years.

Individual Alliance Excellence Awards went to the HP-Microsoft Front-Line Partnership and the Sprint-Cisco Systems' Strategic Alliance. The HP-Microsoft collaboration has grown over the past two decades to drive dramatic value for both companies. The Sprint-Cisco relationship, although newer, has a very significant material impact for both parent companies. Both of these alliances continue to evolve from their initial form and goals, with executives working closely to find new sources of value.

"A critical component of ASAP's mission - to advance the state of the art in alliance management - is to recognize and publicize exemplary companies," said William Lundberg, Founding President and Executive Director of ASAP. He cited as examples the Association's global sponsors, who include Accenture, Boehringer-Ingelheim Pharmaceuticals, CA, Cisco Systems, The Dow Chemical Company, Eli Lilly and Company, GlassSemiKline, Hewlett-Packard Company, IBM, Microsoft Corporation, Oracle Corporation, P&G, SAP, Siemens, Sun Microsystems, Suntec, Unisys Corporation and The Warner Company.

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# CAA V5 Communities & Business Model



## CAA V5 SW Partners

Develop, market and sell commercial applications based on V5 PLM with strategic fit with DS offering

License: *DS channel : Development, evaluation & demonstration licenses that includes CAA-RADE/3D PLM solutions (Interactive & API)*  
 Usage: *ISVs develops CAA V5 apps and markets, sells and support*  
 Contract: *Software Community Program*  
 Support: *High level of support from R&D + Standard CAA Technical support Consulting for the specifications and the architecture provided by DS*  
 Marketing: *Support through event, press, brochure, web site, etc.*

## CAA V5 SW Adopters

Independent Software Vendors developing on open access to V5 PLM

License: *DS channel, Development, evaluation & demonstration licenses that includes CAA-RADE/V5 PLM solutions (Interactive & API)*  
 Usage: *ISVs develops, markets & sells CAA V5 apps*  
 Contract: *CAA V5 Adopter Program, Adopter declare the product intent (scope of the project). No detailed specifications required*  
 Support: *Standard CAA Technical support (hotline, ...)*  
 Marketing: *Web site, etc.*

## Development Service Provider

Develop and sell on demand customer specific applications based on V5 PLM

License: *IBM channel*  
 Usage: *Service Provider develop CAA specific program on behalf and for the account of a customer and for that customer's internal industrial use exclusively. Intellectual Property remains Customer's Intellectual Property*  
 Contract: *Development Service Program (Extension of the existing CAA license rights for development and training package)*  
 Support: *Bug report + training + Standard CAA Technical support (hotline, etc.)*

## V5 PLM Customers

Develop applications based on V5 PLM for internal use

License: *IBM channel*  
 Usage: *Internal use only,*  
 Contract: *Standard IBM customer agreement*  
 Support: *Bug report. IBM educational program (optional)*

- ⇒ **Open development infrastructure**
- ⇒ **Clear & coherent business model for each community**
- ⇒ **... all benefit from same architecture & support**

**CAAV5**  
Developer Conference  
**DEVCON**

# CAA V5 Global Ecosystem Reunion



**CAAV5**  
Developer Conference  
**DEVCON**

**INNOVATE**  
WITH  
V5 OPENNESS

June 27<sup>th</sup> & 28<sup>th</sup>, 2006  
CNIT - Paris La Défense - FRANCE  
[www.3ds.com/devcon](http://www.3ds.com/devcon)



**CAAV5**  
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**INNOVATE**  
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June 27<sup>th</sup> & 28<sup>th</sup>, 2006  
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## DEVCON 2006 - Worldwide Conference

The DEVCON is a unique event for Dassault Systèmes' customers and partners, to receive latest information on V5 PLM strategy and developments, gain technical insights and examples of practical applications on CAAV5. Discover new ways to grow your business, meet people and enhance your network.



### PROGRAM : 2 DAYS EVENT

- > Plenary, Strategy & Technical Sessions
- > FREE Technology & Methodology Consulting
- > Technology Area with Partners, DS Brands & Solutions

### MAJOR NEW TOPICS THIS YEAR

- Advances on Enterprise Collaborative Business Process Infrastructure
- All about SIMULIA, the open multi-physics platform that supports realistic simulation
- 3D for All, the Dassault Systèmes break-through for opening up 3D technology to any user
- A unique 3D behavioral platform following the recent acquisition of Virtools
- Latest update for 3D XML, a universal light-weight XML-based format
- What's new in V5 PLM R16
- Preview of R17 highlights



### WHY YOU SHOULD ATTEND

#### You are a manager

- Anticipate future challenges
- See the possibilities for improving your business performance
- See how other managers have transformed their innovation processes
- Benchmark your company's development process and learn from best practices

#### You are a developer

- Gain practical knowledge about using the CAAV5 platform
- Meet DS experts
- Tips and tricks for CAAV5
- Get real user feedback
- Best-in-class practices
- Get answers to your technical questions
- Opportunity for free CAA Consulting

### WHO SHOULD ATTEND

- Industrial Customers, Software / Technology / Service / Business Partners,
- CAAV5 Developers, Technical Managers and Executives,
- Academia, Industry Analysts, Press

A selection of companies who have participated at previous events include:

AKOBU ALPHA, AIRBUS, AIRBUS COMPA, ALCATEL SPACE, ANCOR PET PACKAGING, AND, APC INTERNATIONAL, BAEI GROUP, BOBIT, CAXA, OEA, GENT AD SYSTEMHAUS, CT CORPTECHNOLOGIE, DANLIER GRYVELER, DASSAULT AVIATION, DELL, EDAG ENGINEERING AND DESIGN AD, ESI GROUP, ETA SA, EUROCOPTER, FAURECIA, FLUENT FRANCE, FONTANA PIETRO, FORD MOTOR, GIGAL, GEOMETRIC SOFTWARE SOLUTIONS, GODOYEAR, GERRY TECHNOLOGIES, HELIX, HOKA HUBER & CO, HITACHI, HP, IBM, JCB, KUKUKO GROUP, INCAE, INERGY AUTOMOTIVE SYSTEMS, INTEL, ISCAR, KOREA AEROSPACE IND., LAND SYSTEMS, HÄGGLUNDE, LMS INTERNATIONAL, LOCKHEED MARTIN INFORMATION SYSTEMS, MAN NUTZFAHRZEUGE, MOT VISION, NICHIA, MICROSOFT, MOLZOWE, RFPACTOFT, MSC SOFTWARE, M-TORRES, DISSEPOS INDUSTRIES, OMRON OPTIS, PRODUCTIVITY ENGINEERING, PRATT & WHITNEY CANADA, PROSTEP, PSA PELISSIOT OTORINA, RENNAULT, SAMBUS, SAATCHI, SCANA, SCHNEIDER ELECTRIC, SIBRAM AD, SINGMA MOTORS, T-SYSTEMS, T.V.H. FORGLUPHARTS, THALES R&T ENGINEERING, TOYOTA COMMUNICATION SYSTEMS, TRINAGAT, VILED, VOLKSWAGEN...



# CAA V5 Global Ecosystem



**5000 +**  
CAA V5 Developers

**140+**  
CAA V5 Partners



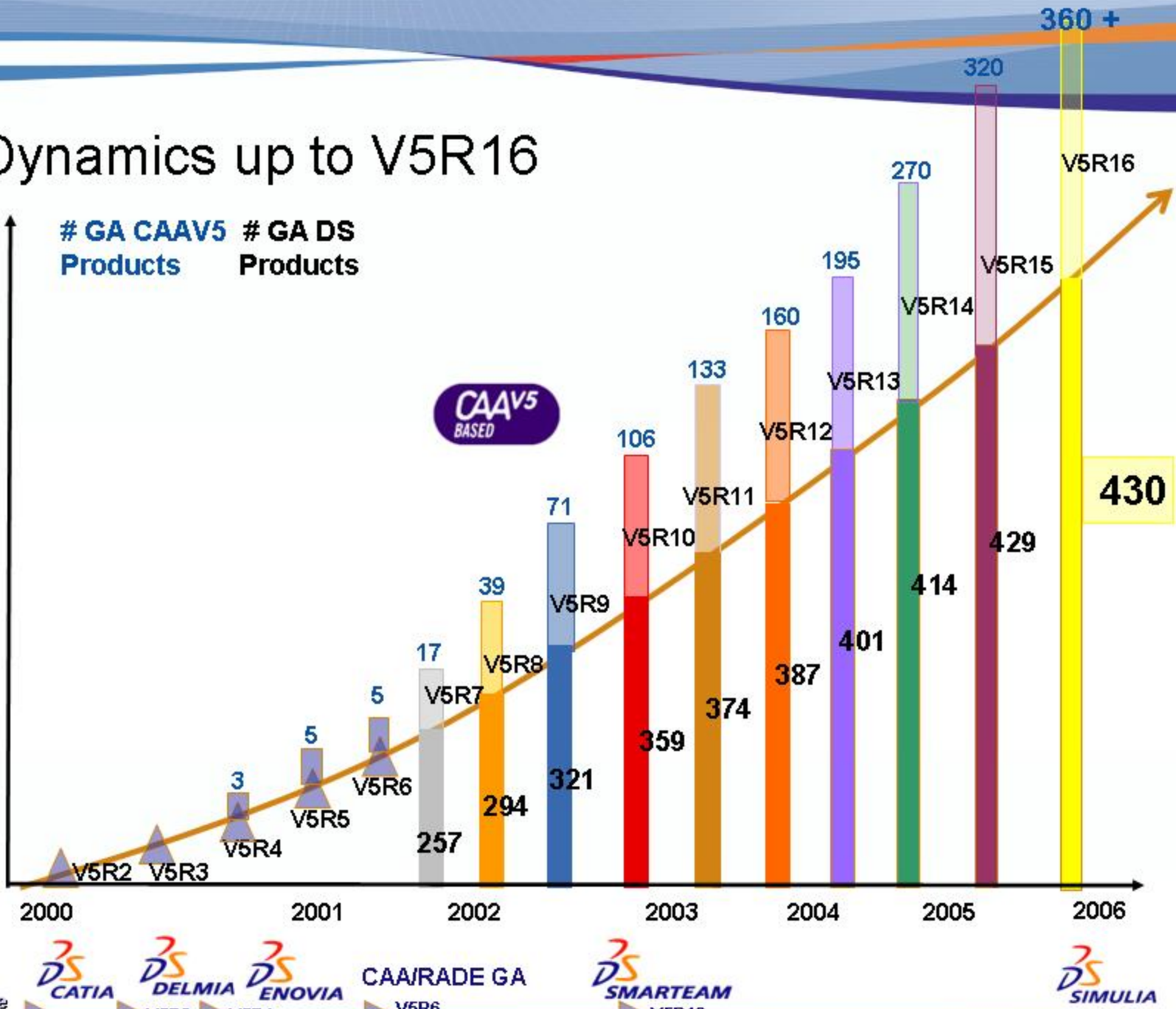
**360 +**  
CAA V5 Products



*“Build the extended V5 PLM Ecosystem”*



# PLM Dynamics up to V5R16





# CAA Web Survey Summary

- 79% to 83% of respondents consider that CAA is bringing them a high or medium value on the following criterias:

- Easiness to develop
- Easiness to maintain
- Simple User Interface
- No data re-creation
- Generative approach
- ROI

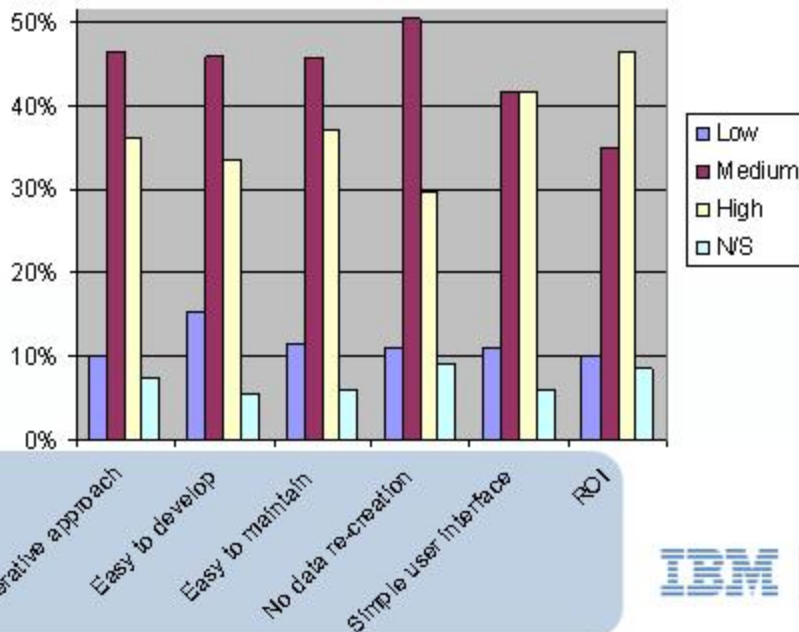
Conducted 02/2006:

Based on responses from 390 CAA industrial end-users and partners (emailing to target list of 3290 names)

- 48% of CAA end-users willing to be contacted for further projects

- 40% → New projects on CAAV5 platform
- 25% → Services on CAAV5
- 19% → To know CAAV5-based partner solutions

"Please indicate your rating by order of importance of the following criteria for integration/development of application around V5"



"DS has provided a unique and revolutionary CAA structure to allow multiple developments for the applications. This results overall in good pace in the development with no compromise on the quality of the development. ... V5 PLM openness broadens the designers and manufacturers view on inventory data by bringing them to a common platform" – GSSL

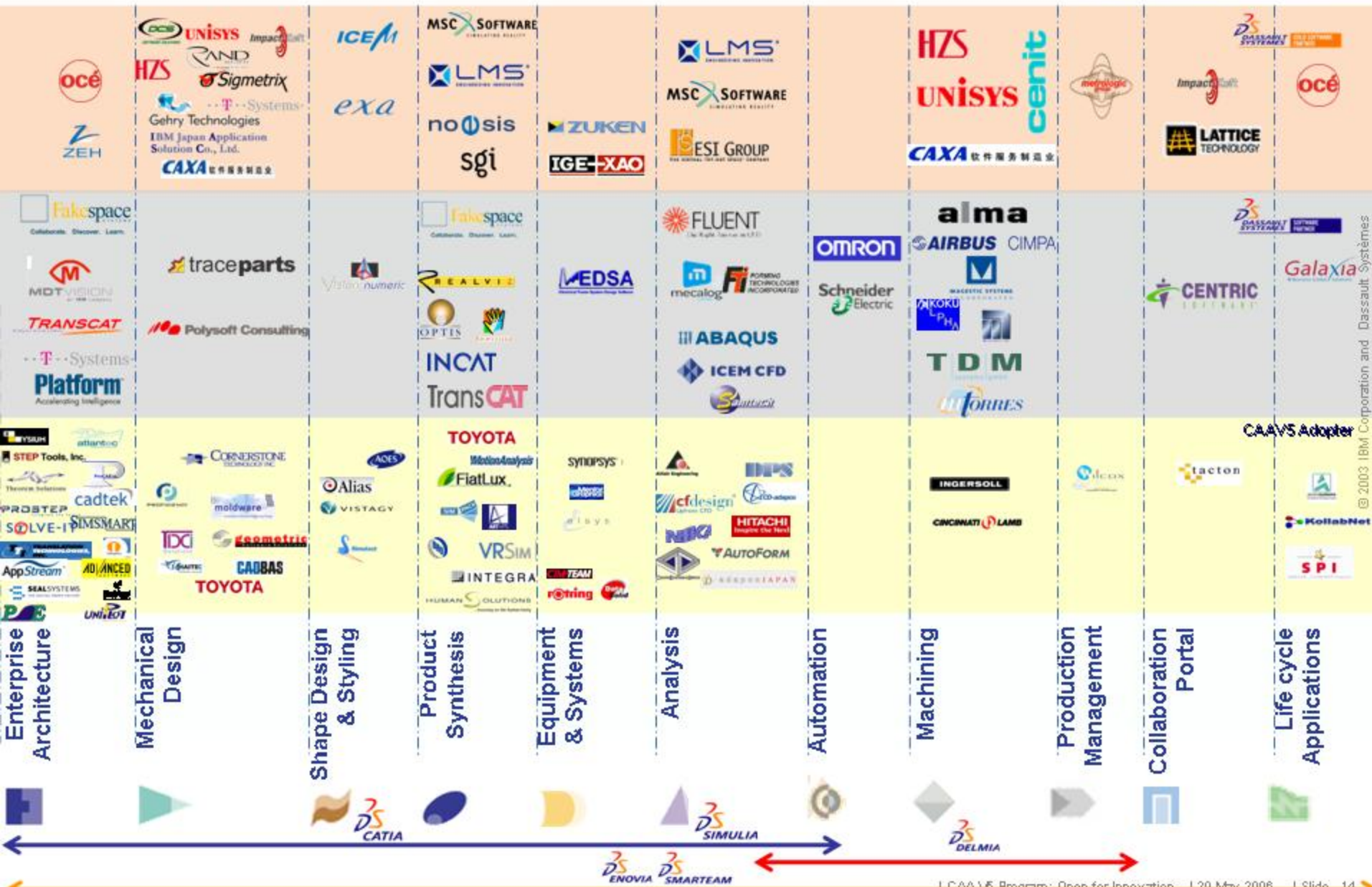
"Easy to learn, easy to implement, easy to integrate" – IBM Service Provider

"CAA/RADE is great, it is very powerful ...." – Brigham Young University

"...I would say that it's a very powerful solution that few are using.... I have been able to develop a Bill of material program that really speeds up the drawings production for us." – Alstom



# CAAV5 Partner Contributions by Domain



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# CAAV5 Partner Contribution by Industries



Domain	MECHANICAL										PRODUCTION										MANUFACTURING										MAINTENANCE										PORTAL																																																																									
	CATIA		SolidWorks		Solid Edge		NX		AutoCAD		SolidWorks		Solid Edge		NX		AutoCAD		SolidWorks		Solid Edge		NX		AutoCAD		SolidWorks		Solid Edge		NX		AutoCAD		SolidWorks		Solid Edge		NX		AutoCAD																																																																									
Sub-Domain	Mechanical Design		Simulation		Manufacturing		Assembly		Quality		Production Planning		Process Control		Maintenance		Inspection		Inventory		Logistics		Customer Support		Reporting		Data Analytics		Integration		Security		Compliance		Performance		Scalability		Flexibility																																																																											
Partner	MASC		IGCAT		INTEGAT		DARBY TECHNOLOGIES		EGE		HZE		CAXA		NINON UNIVERZA		HINON UNIVERZA		FOKUS		SIAMORIS		TRESBITS		GAYBROS		INTEGAT		TEGAT		OLE		ZEH		VISION PARTS		EUS		SOMER		FABRIS		INDUSTRIAL		MASC		ORBIT		EADZE		INTEGAT		EBSA		DOEKAD		ZARSO		EBC GROUP		EJED		EJ		AUBUS		GEM CEO		MBCAD		MBC		SARFIELD		ABBY		ALMA		SINIAO		ARQUE CIMECA		HZE		MAGNUS		MOSHUIS		ERKON		INFINITIB		TEAM		MORSE		MOTIVION		Platform		OLE		T-SERIES		INTEGAT		ZEH		CUMBI		LABILE		CORCO	



Automotive	Cars & Light Truck OEMs, Motorcycles		Auto Suppliers, Engine Makers		Trucks & Heavy Equipment, Buses, Trains	
	X	X	X	X	X	X



Aerospace	Airframe OEMs		Defense (Electronics/Aeronics)		Missiles & Drones, Spare Systems		Aero Supplier, Propulsion	
	X	X	X	X	X	X	X	X



Shipbuilding	Military, Commercial, Cruise Ships, Yachts	
	X	X



FM	Fabricated Metal Products		Industrial Machinery		Mobile Equipment & Products		Industrial Equipment	
	X	X	X	X	X	X	X	X



Electrical/Electronics	PC & Peripherals		Appliances		Home Entertainment		Telco OEMs		Medical		Industrial Automation		Power/Buiding Systems		Electrical Components		Semiconductors, Contract Manufacturing		Lighting	
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X



Consumer Goods	Furniture		Home Garden, Jewelry		Leisure and personal goods	
	X	X	X	X	X	X



Process, Power, Petroleum	Power		Process		Chemicals & Petroleum	
	X	X	X	X	X	X



Architecture & Construct	Architecture	
	X	X



# V5 PLM and CAA V5 Value Channels



## V5 PLM Customers

Channels



Offerings



Solutions



CAA = Component Application Architecture  
RADE = Rapid Application Development Environment



# Generative Car Solutions

## Supplier Collaboration

TRANS CAT

- S4 / Part and Tooling Supplier
- PLM for Large Module and System Supplier

Standards Compliance / Quality Assurance

## Enterprise Collaboration

- VPDM / Engineering Hub
- xPDM integration
- Engineering Package Exchange
- Vehicle Synthesis
- Ext. Ent Visualization & Collaboration

Kick-off

Hard Point Freeze

Styling Freeze

SOP

Business & Program Controls

Production Monitoring

Styling & Portfolio Alternatives

Service After Sales

End Of Life

Product Architecture & Physical Integration

Product Systems Engineering

Performance Integration & Correlation

Manufacturing Engineering & Assembly Integration



Acoustic / Motion / Durability / Structural



CFD/Flow



Composite

## Vehicle Synthesis



Body

Interior

Chassis

E&E / SW

Powertrain

## CAE Simulation

- In process simulation
- Advanced CAE

## Generative Tooling

- Tooling Fixtures
- Mold
- Stamping Die
- Progressive Die
- T-Systems

## Digital Manufacturing

- BiW Assembly
- PWT machining
- Final Assembly



Class A

## Generative Car Design

- Vehicle Architecture
- Styling to Class A
- Body In White
- Interiors & Exterior Trim
- Chassis
- Electrical
- Powertrain



HZS

Core & Cavity Mold

UNISYS

Die Structure & Mold

Press Die



Stamping

cenit

CAM / Post-processing

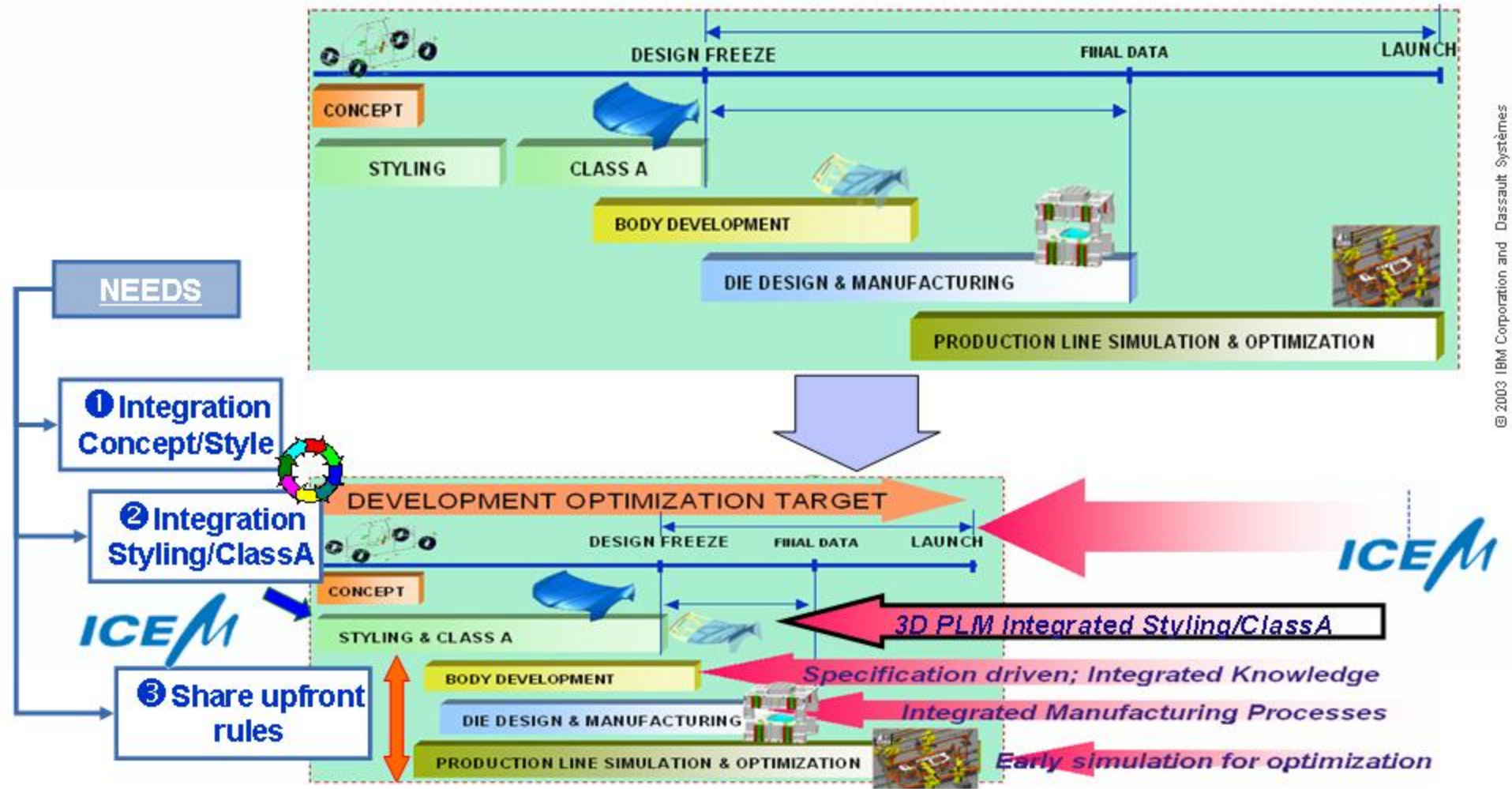
TDM

Tooling Management



Inspection

# Reduce Cycle Time and Cost in Body Design



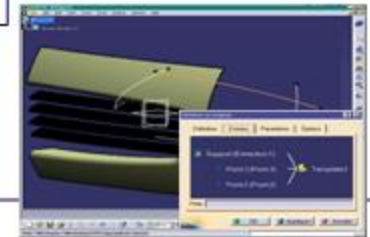


# Integrate Styling and Class A Design Processes



## DMU Collaboration

- ❑ Capability to design parts inside the context of a product, by creating associative links between parts.
- ❑ Quicker completion of Variants for decision support

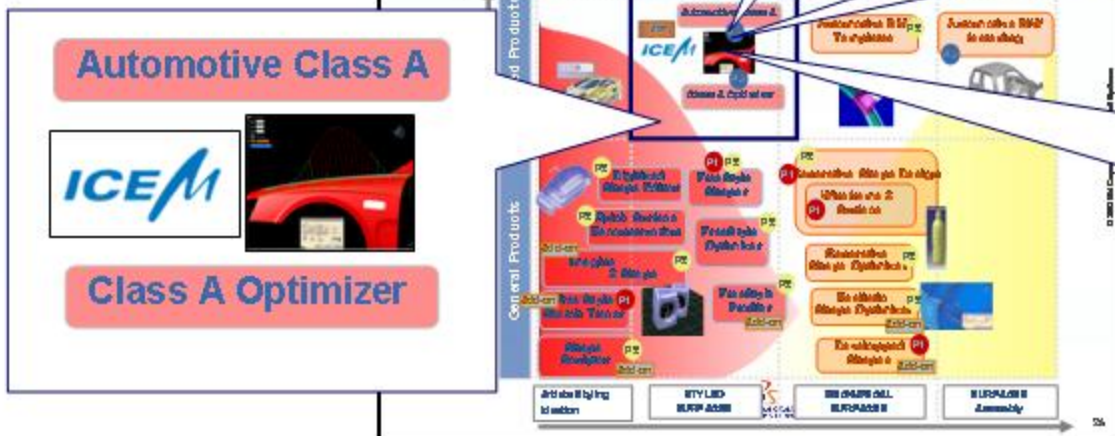


ation and Dassault Systèmes

## Knowledge

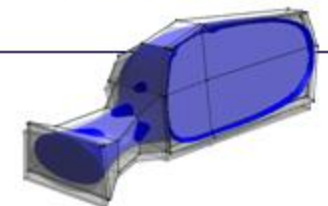
- ❑ Ability to capture and reuse a part or perform an engineering task
- ❑ Ability to introduce knowledge in any form

## Shape Design & Styling product portfolio

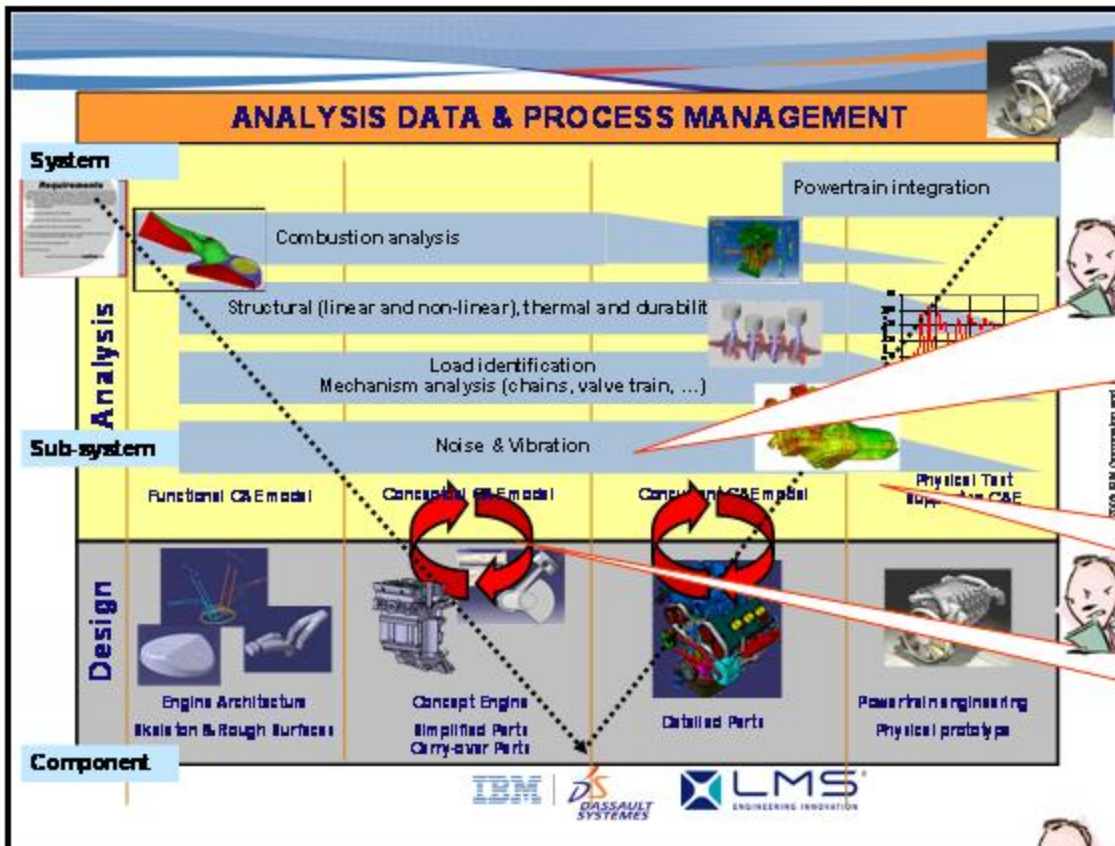


## Surface Modeling Technology

- ❑ Imagine & Shape : 3D intuitive modeler for aesthetical shape design
- ❑ Accessible to non CAD-experts and designers



# Challenges with Engine Functional Performance Engineering



❑ Today, design, load identification (MBD) and stress analysis (FEA) are done **sequentially by different people**, resulting in these **disadvantages**:

- ❑ Process inefficiencies
- ❑ Long iteration cycles
- ❑ Non-value-added activities
- ❑ Limited number of design iterations

❑ **Problems only found late** in the development process when physical prototypes are built

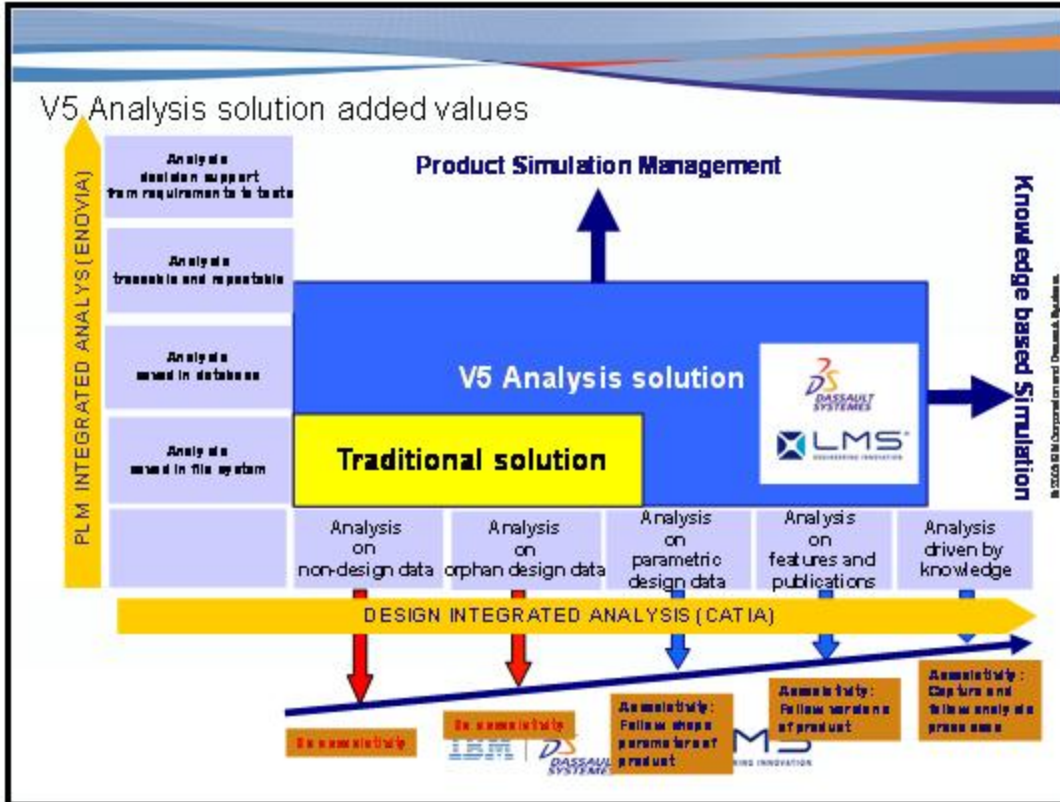
❑ Multiple **disconnected** analysis tools

❑ High **maintenance cost** of various tools



# Engine Functional Performance Engineering –

## DS-LMS Value Proposition



### ENOVIA

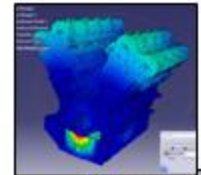
- Maximize information reuse – PLM integrated CAD and analysis

### CATIA V5 analysis

- Design integrated analysis

### LMS Virtual.Lab

- Analysis leads design – reliable, practical and in-time functional performance analysis
- Analysis in context – from component level to system level
- Increase value added engineering time – integrate CAD, CAE and test data, co-simulation with external FEA and variety of tools for cam design, control simulation, hydraulics simulation, ...

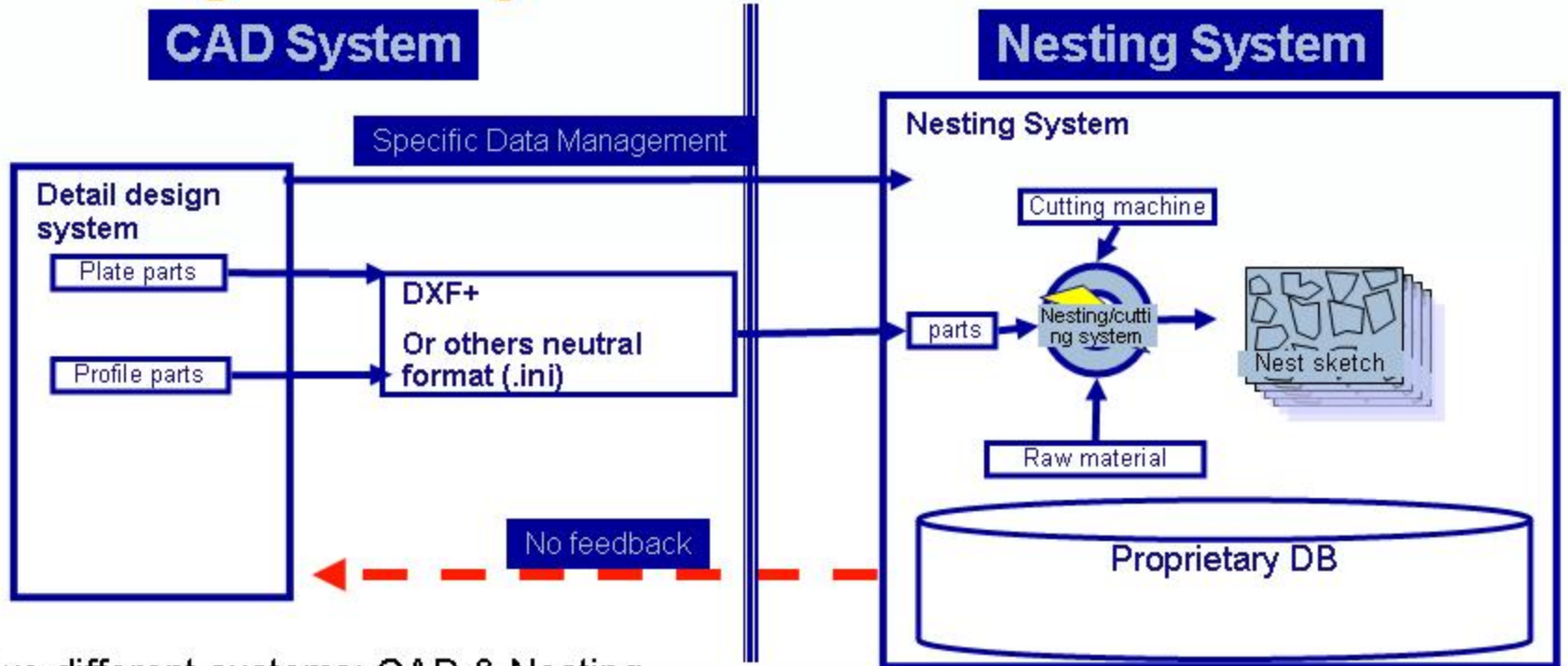


## ■ End to End Integrated Functional Performance Engineering Solution

- Minimize non-value-added engineering time
- System level, "analysis in context" approach makes calculation results more reliable.
- Reliable simulation results while keeping calculation times realistic
- Short iteration cycles by integrating design-load identification and stress calculations

# Sheetmetal Manufacturing Challenges

*from heterogeneous systems ...*



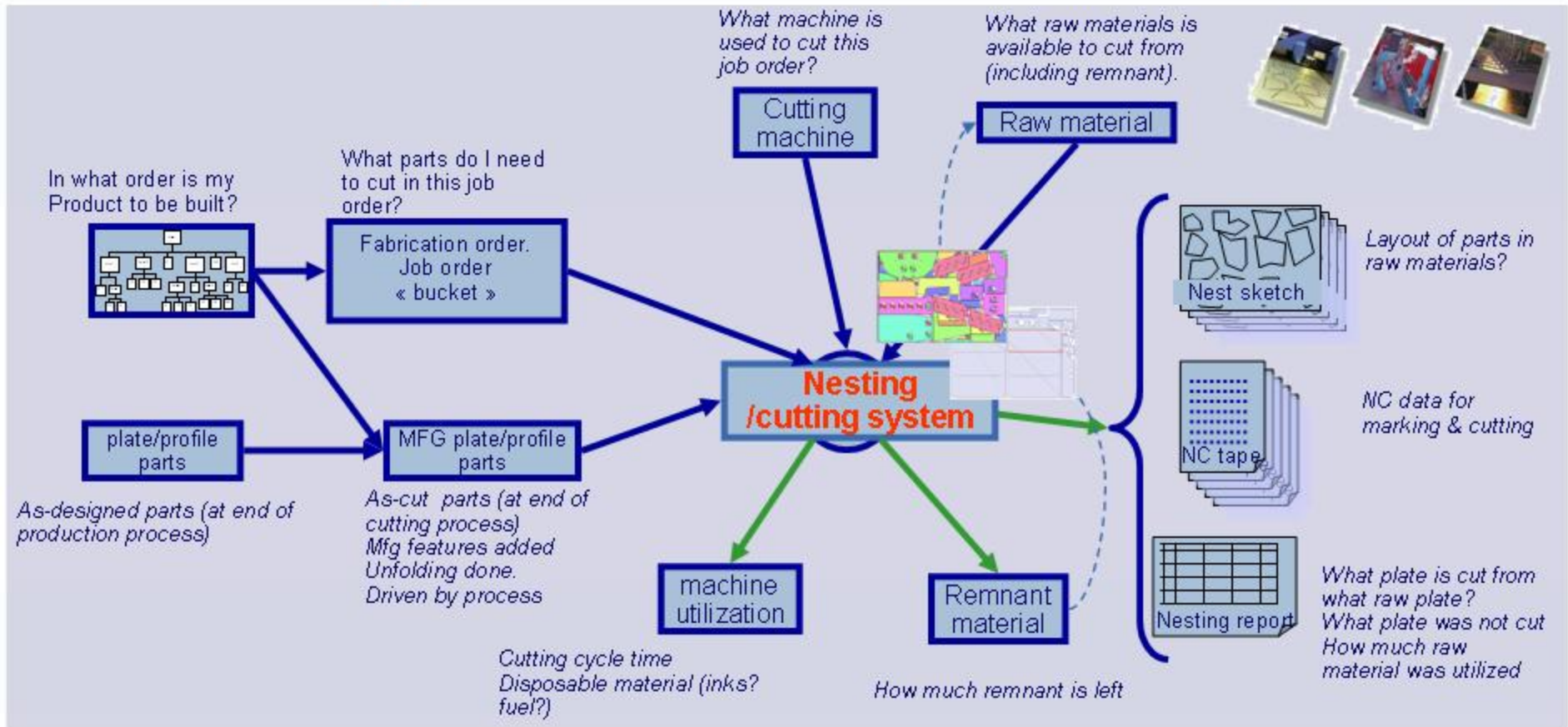
- Two different systems: CAD & Nesting
- Geometrical Interface
  - Intermediate file management (DXF, INI)
- Management interfaces
  - Based on “list of parts to produce”
  - Based on job orders





# DS – ALMA Value Proposition

## ... to one comprehensive solution



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- One single solution to Capture, Simulate and Optimize Production process

# Value of V5 PLM Integration



Illustration with CAAV5 Partner OPTIS

## Process description :

1. Create geometry in CATIA V5

~~2. Exchange a version through neutral format IGES~~

~~3. Repair and tune results ...~~

4. (Re)Define the material and input parameters

5. Run the computation

6. Analyze the results

~~7. Explained to the designer what should be modified ... and why...~~

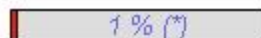
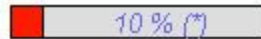
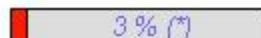
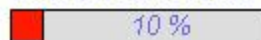
8. Perform the design modification in CATIA V5

~~9. Exchange again in order to re run and check the results...~~

..... Steps not needed with V5 PLM integrated solution

X Loop

Unit cost (per loop)

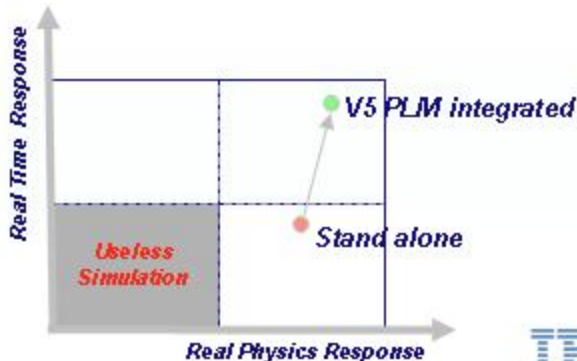
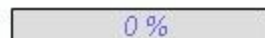
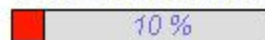


(\*) Must be done each loop

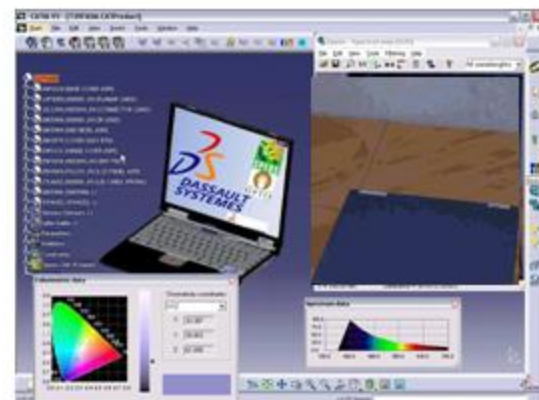
Global cost (6 loops)



PLM integrated cost

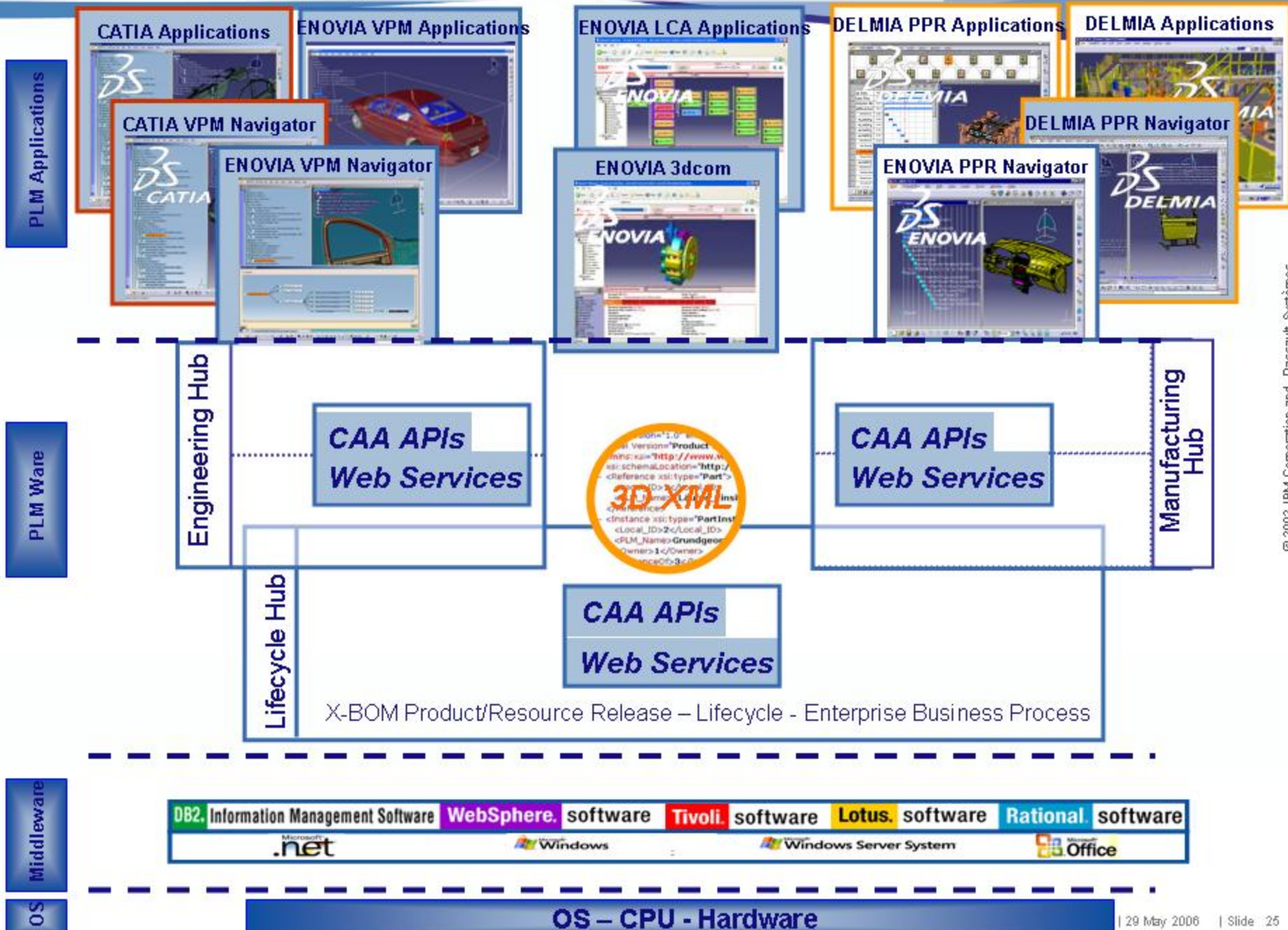


\* Test Data Courtesy of OPTIS





# CAA V5: Designed for Openness

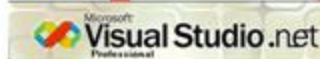


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# CAA V5 RADE: Key Values

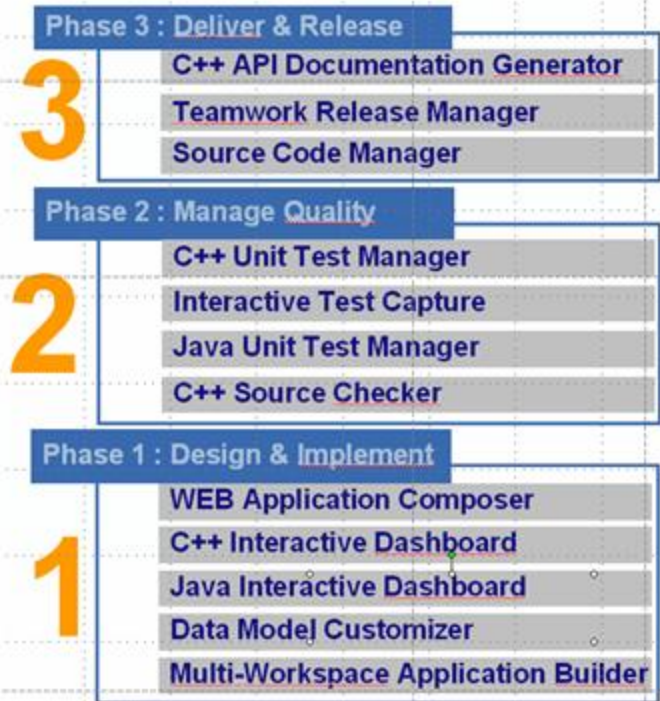
- Support of open standards
- Support of best in class middleware
- Openness with 3D XML
- Comprehensive range of published APIs and Web Services
- State-of-the-art development tools

XML



- 3D
- CAA
- Coll. Hubs
- Real-Time Col.
- Portal
- EIF
- AS
- Security
- Communication
- RADE
- RDB
- Lang.

- OpenGL, VRML, HSF, XVL, TIFF ...
- CORBA (IDL), Web Services
- STEP, IGES, XML
- Peer to Peer, Server Based, Async / Sync.
- Mozilla, IE, WebSphere Portal, SharePoint Portal
- ANSI C++ API, Web Services
- J2EE, .NET
- LDAP, SSL / TLS
- HTTP, HTTPS, CORBA, IIOP,
- UML
- SQL
- ANSI, IEEE



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# Detailed Summary

- **Industry recognized object oriented architecture, CAA RADE development tools and support services**
  - ⇒ with holistic openness
  - ⇒ comprehensive range of published APIs and web services
- **Optimized performance and ease-of-use**
  - ⇒ CAA V5 applications fully embedded in V5 PLM
  - ⇒ V5 architecture and PPR Hub manage both product and process data
- **CAA V5 ecosystem program**
  - ⇒ for industrial users and software editors
  - ⇒ 3rd party applications and integrations around V5 PLM
  - ⇒ thriving CAA ecosystem with 140+ ISVs, 360+ CAA products and 5000+ developers
- **Extended V5 PLM end-to-end process coverage**
  - ⇒ addressing industry process needs
  - ⇒ comprehensive solutions with embedded CAA products
  - ⇒ brought to you via our value channels

1

PLMware powered  
CAA V5 Apps

OPEN

2

Customize V5 PLM  
Applications

OPEN

3

Expand V5 PLM  
hubs models and  
solvers

OPEN

4

V5 PLM Enterprise  
Integration

OPEN

5

3D XML

OPEN

# Conclusion on CAA V5

- Open, open, open
- Based on standards
- Complete end-to-end PLM
- ... innovation happens

... thanks to the Ecosystem

