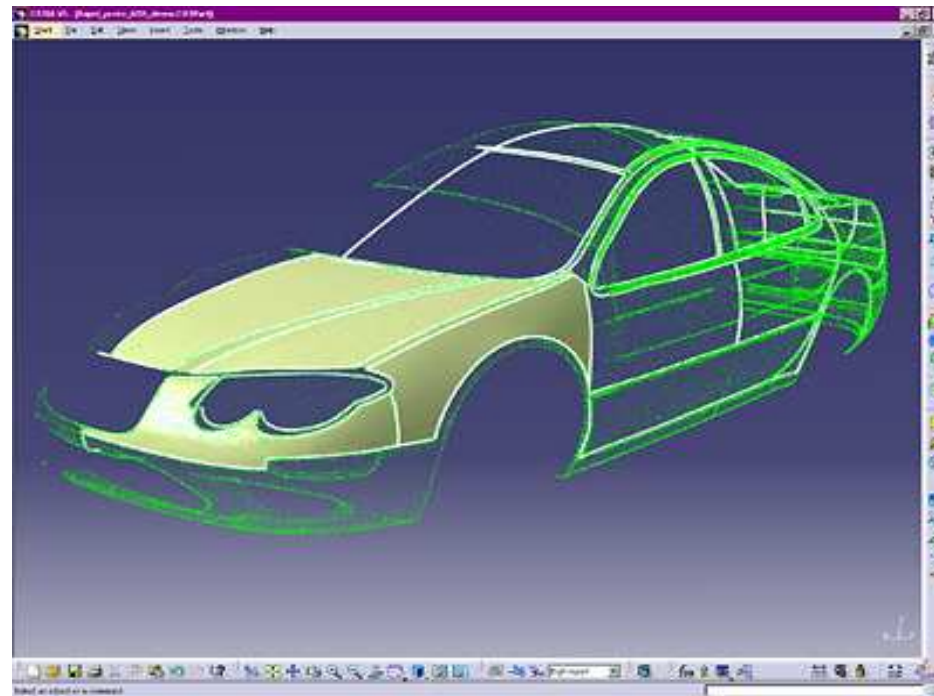IBM

CATIA
Reverse Engineering
for the Automotive Industry
Technical Overview Presentation

CATIA

CATIA Reverse Engineering
for the Automotive Industry

Content

| 1	Key messages / fundamentals
2	Industry challenges
3	CATIA solution and value
4	Conclusion

Key messages / fundamentals
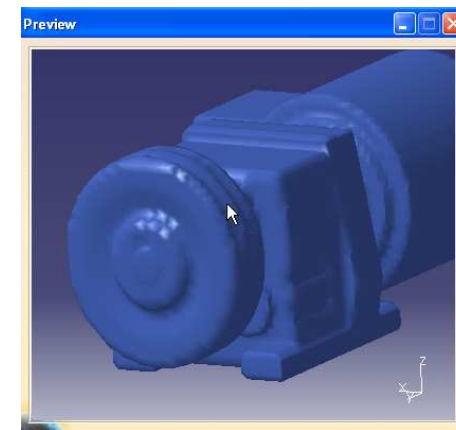
Key Messages | Definitions

- **REVERSE ENGINEERING:**
  - any work done on a **cloud of points**

- **CLOUD OF POINTS:**
  - result of the **digitization** of a physical mock-up, an existing part, a sample, a prototype…
  - or mesh computed by a specialized software
    - By simulation
    - Or as a DMU Wrapping or Swept volume
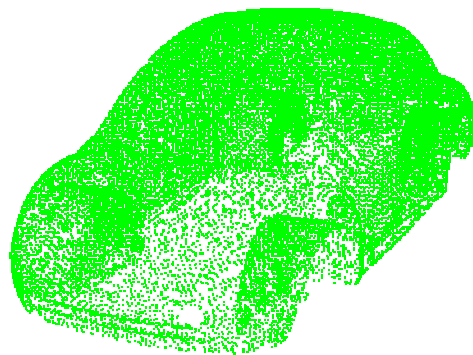
Cloud = Points only
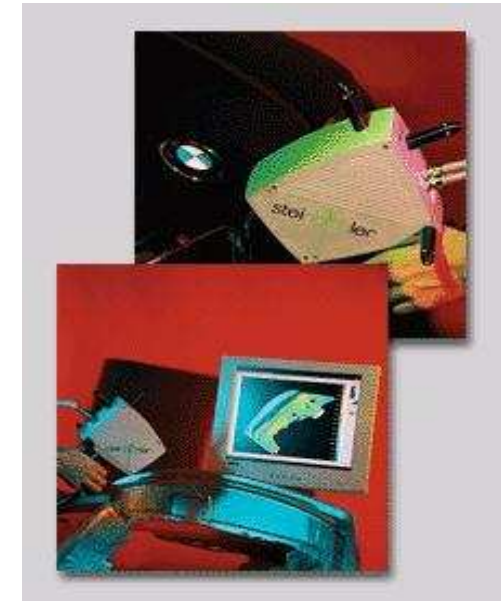
Cloud = Mesh

DMU Wrapping (mesh)

Key Messages | Definitions

- DIGITIZATION:

  - measurement of points on the surface of the object with Coordinate Measurement Machine (CMM)

  - Generally based on an optical device producing dense clouds = clouds with huge number of points (up to 10s of millions)

  - Measured points may be directly output in a mesh

Key Messages | Overview

1. Integrated Process Centric Portfolio
   – Integrated reverse engineering solutions developed in partnership with industry leaders
   – Continuous data flow shortens product development cycle and facilitates communication

2. Design Performance for Innovation
   – Support process of shape creation to unleash creativity

3. Breakthrough technologies
   – Unmatched tools for creation of surfaces based on latest developments of subdivison surface technology
   – Capacity to apply global deformations to any kind of shapes

4. Collaborative PLM
   – Enhanced capability to communicate between teams favors concurrent engineering

5. Easy, Open, Scalable
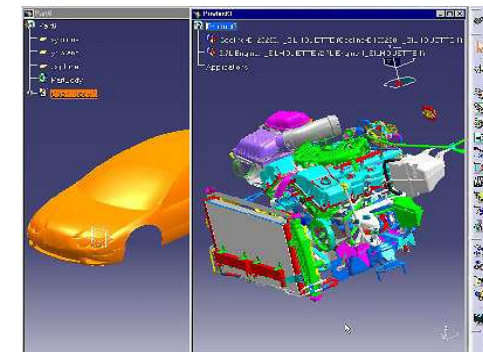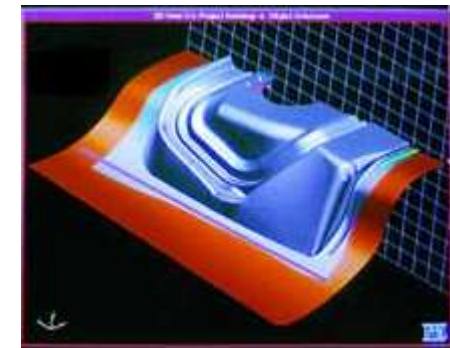   – Modular and flexible solution completed by an ecosystem of CAA V5 partners

Industry challenges

Industry Challenges
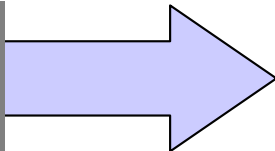
- **In the DESIGN sector :**
  - Work with physical mock-ups
  - Design copy
  - Tuning

- **In the TOOLING sector :**
  - Work with prototypes
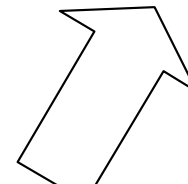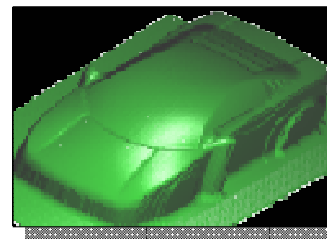 - Work with finite element simulations

- **In the DMU sector :**
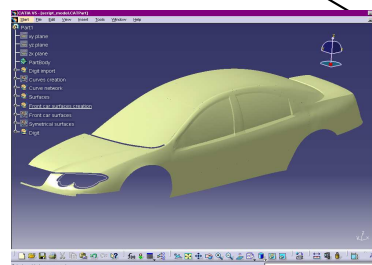 - Space analysis
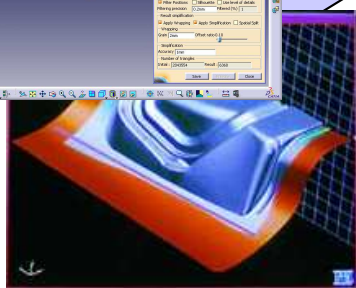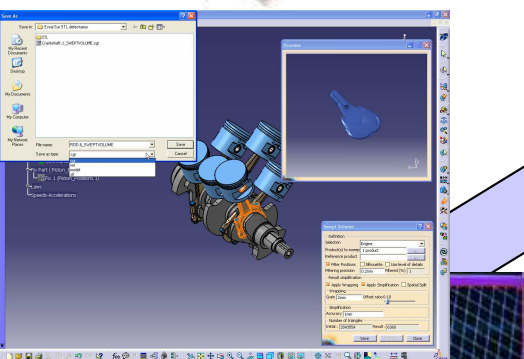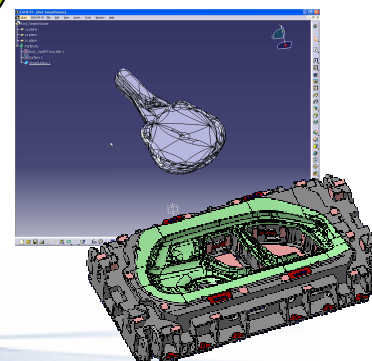 - Kinematics

Reverse Engineering

Prototype, mock-up, sample, …

Computed shapes

DSE

MESH

QSR

Surfaces and solids

Optimized shape

RSO

Freestyle

Rendering

Manufacturing

Digital Mock-Up

…
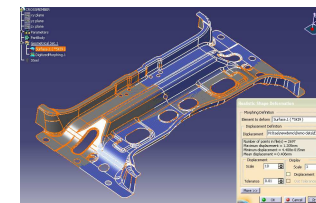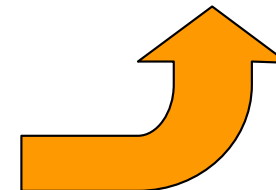
Reverse Engineering | Partners

- All measurement hardware suppliers supported via neutral cloud formats:
  - ASCII
  - IGES
  - STL

- Most common proprietary formats supported

- Special partner = CREAFORM
  - Measurement hardware manufacturer
  - Proposes CATIA to his customers
  - Soon to provide on-line import of cloudinto CATIA

Ascii free
Atos
Cgo
Gom-3d
Hyscan
Iges
Kreon
Opton
Steinbichler
Stl
3DXml (tessellated)

More on http://www.creaform3d.com/

CATIA

Conclusion

Conclusion | Benefits

- **Key Messages**
  - Integration to CATIA, technological breakthrough for surface creation and surface deformation

- **Benefits**
  - Key for collaborative engineering

- **Reference customers**
  - Major car makers and tool makers

- **Strength vs competition**
  - The only Reverse Engineering solution natively integrated to a complete PLM platform

Thankyou