PLM Vis
custom visualization for the advancement of in-house processes

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Agenda

- PLM Components
- In-house Processes
- PLM Vis
  - What is PLM Vis?
  - When is PLM Vis the right solution?
  - Benefits
- Versatile Technology
- Versatile Format
- UGS uses PLM Vis
- Customer Successes
- Summary
Central to UGS PLM Open Strategy

- produce component technology, translators
- technology available to entire PLM community
In-house processes – competitive differentiation

- Reflect the company
- Evolve over time as a company develops
  - Culture
  - Methodology
  - Partnerships

- In-house software (by definition, Custom)
  - Not part of core-competency
  - Reluctantly developed
  - No suitable off-the-shelf applications
  - The “glue” that make some processes work
  - Hard to access data embedded in proprietary formats
  - Collaborating with third parties and suppliers
What is PLM Vis?

PLM Vis is leading-edge visualization component technology that enables:

- Viewing, Interrogation, and Markup of nearly every popular 2D format as well as JT (3D), NX, Solid Edge and Parasolid XT data in a single environment
- Portable architecture – Java beans and ActiveX controls
- Rapid development of custom visualization solutions through the use of building blocks
- Seamless real-time internet & intranet collaboration
- Extending the value and reach of 2D and 3D intellectual property across the enterprise
- Broadening the scope of product data through the use of PLM XML
PLM Vis Product Line

- **PLM Vis Base**
  - 2D, viewing, navigation, image capture/export
  - 3D, simple viewing

- **PLM Vis Standard** (cf Teamcenter Visualization Standard)
  - 3D, viewing, part selection, rubberbanding
  - Save/load sessions, navigation

- **PLM Vis Pro** (cf Teamcenter Visualization Pro)
  - 3D, measure, markup, properties, appearance
  - Animation, cross-section, PMI, conferencing
# PLM Vis supported file formats

**3D formats supported**

<table>
<thead>
<tr>
<th>Extension</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>.jt</td>
<td>Common 3D format promoted by JT Open organization for enabling product visualization and information distribution and enhancing data sharing between PLM software applications. Includes data describing model's geometry, material, assembly, PMI (product manufacturing information), and other attributes.</td>
</tr>
<tr>
<td>.v</td>
<td>UGS Teamcenter Session file – state file that include session parameters as well as mode</td>
</tr>
<tr>
<td>.x, .x.b, .xml_info, .xmc_bin</td>
<td>File formats used by Parasolid® – the geometric modeling kernel software that serves as popular CAD, CAM and CAE products.</td>
</tr>
<tr>
<td>.prt</td>
<td>Model and drawing files created by NX and its predecessor Unigraphics® – UGS' integrat application.</td>
</tr>
<tr>
<td>.prtx</td>
<td>Model and drawing files created by Solid Edge® – UGS' value-based 3D CAD application Version 6).</td>
</tr>
<tr>
<td>.vrml</td>
<td>Virtual Reality Markup Language</td>
</tr>
<tr>
<td>.stl</td>
<td>Stereolithography format for rapid prototyping.</td>
</tr>
</tbody>
</table>

**2D formats (cont’d.)**

<table>
<thead>
<tr>
<th>Extension</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>.dxf</td>
<td>AutoCAD Drawing Web Formats v5, v4, v3, v2</td>
</tr>
<tr>
<td>.emf</td>
<td>Enhanced Metafile</td>
</tr>
<tr>
<td>.gbr, .gbr</td>
<td>Gerber plot file formats RS274D and RS274X</td>
</tr>
<tr>
<td>.hpg, .hp2, .pls, .prn</td>
<td>HP Graphics Language 1 and 2, HP Raster Transfer Language</td>
</tr>
<tr>
<td>.igs, .iges</td>
<td>Initial Graphics Exchange Specification</td>
</tr>
<tr>
<td>.jpeg, .jpg</td>
<td>Joint Photographic Experts Group (JPEG) is a common format for storing images.</td>
</tr>
<tr>
<td>.mdl</td>
<td>Model file</td>
</tr>
<tr>
<td>.md</td>
<td>MetaDataStamp</td>
</tr>
<tr>
<td>.mds</td>
<td>MetaDataStamp</td>
</tr>
<tr>
<td>.mi</td>
<td>HP CoCreate (not available on SGI or AIX platforms), ME10 and ME30</td>
</tr>
<tr>
<td>.mrv, .mil, .milr</td>
<td>MIL-R-28002 Type I Raster</td>
</tr>
<tr>
<td>.mpc</td>
<td>Multi-page CALS file</td>
</tr>
<tr>
<td>.ovl, .ovl, .ovk</td>
<td>Markup layer</td>
</tr>
<tr>
<td>.pcx</td>
<td>Windows Paintbrush</td>
</tr>
<tr>
<td>.pct</td>
<td>Macintosh PICT – PICT</td>
</tr>
<tr>
<td>.png</td>
<td>Portable Network Graphics</td>
</tr>
<tr>
<td>.ai, .eps</td>
<td>PostScript Levels 1, 2 and EPS</td>
</tr>
<tr>
<td>.ras, .sun</td>
<td>Bilevel Sun</td>
</tr>
<tr>
<td>.rvg</td>
<td>Raster viewing format</td>
</tr>
<tr>
<td>.dft</td>
<td>Solid Edge Drafting Format</td>
</tr>
<tr>
<td>.tif</td>
<td>Tagged Image File Format</td>
</tr>
<tr>
<td>.tcl</td>
<td>TLC file format</td>
</tr>
<tr>
<td>.fxx, .oxm, .fsm</td>
<td>TIF/IFF – Monochrome, single and multi-page tiled raster format</td>
</tr>
<tr>
<td>.prtx</td>
<td>NX (formerly Unigraphics) part file drawings</td>
</tr>
<tr>
<td>.txt</td>
<td>ASCII text</td>
</tr>
<tr>
<td>.zip</td>
<td>The files contained within the ZIP are displayed in a single multi-page 2D image window. You can navigate through the pages (files) using any of the available 2D multi-page navigation options.</td>
</tr>
</tbody>
</table>

**2D formats**

<table>
<thead>
<tr>
<th>Extension</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>.906, .907</td>
<td>Calcomp plot file formats 906 and 907</td>
</tr>
<tr>
<td>.pdf</td>
<td>Adobe Acrobat Document Format</td>
</tr>
<tr>
<td>.bmp</td>
<td>MS Windows bitmap</td>
</tr>
<tr>
<td>.bmp</td>
<td>OS/2 bitmap</td>
</tr>
<tr>
<td>.c4</td>
<td>JEDMICS C4 tiled raster format</td>
</tr>
<tr>
<td>.cgm</td>
<td>Binary Computer Graphics Metafile MIL-D-28003, ANSI X3.122</td>
</tr>
<tr>
<td>.dgn</td>
<td>Microstation DGN file format (on Windows)</td>
</tr>
<tr>
<td>.dxf</td>
<td>Autodesk Drawing Exchange Formats 2002, 2000, 14, 13, 12, 11, 10, 9</td>
</tr>
</tbody>
</table>
PLM Vis adds viewing to your applications
PLM Vis - Customer Benefits

- Application building is very easy
  - Drag and drop - e.g. Visual Studio, JBuilder,…

- Set of connecting building blocks that enable application development

- It is THE solution for developers when there is no off-the-shelf application that meets requirements

- Java Beans - Portable (Unix and Windows)

- ActiveX Controls - Windows optimized

- Extends the reach of JT and other 3D and 2D intellectual property in the enterprise
ActiveX and Java
Standalone vs Embedded in Web Page

Visual Studio

Internet Explorer
PLM Vis is Highly Configurable

1. Objective: deliver dynamic 3D content to the entire support team to enhance training and cut costs associated with maintenance and repair.

2. The solution leverages the same lightweight JT models that are presently being created.

3. Users can access the JT models using a simple web interface and the proven EDS applications Vis View or Vis Mockup.

4. For specialized tasks, Vis View can be embedded electronic documentation to seamlessly augment current processes with intelligent 3D models.

5. This will create innovative and more cost-effective methods of communication.

Selected Examples:

Note: Some examples will launch VisView while others will use the embedded viewer.

Data Access

Rollover Navigator

[Component Locator] Select from each pull-down menu and click "Build View".

Reference Geometry is Grey, the selected component is Yellow. Left-Click on any part for detailed information.

Available Documents for:

1. Parts List
2. Assembly instruction
3. Replacement Ordering
PLM Vis - Versatile Technology

- Reuse of intellectual property
- Create focused applications
  - Simpler user interface – easier to develop and use
- Scaleable configuration
  - Range of functionality
- Internet
- Intranet
**JT - Versatile Format**

<table>
<thead>
<tr>
<th>Model</th>
<th>Bodies</th>
<th>Faces</th>
<th>CAD File</th>
<th>JT File</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Design Quality</td>
<td>View Query</td>
</tr>
<tr>
<td>![Model 1 Image]</td>
<td>9</td>
<td>165</td>
<td>XT - 247 Kb</td>
<td>10,658 fct</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>302 kb</td>
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<tr>
<td>![Model 2 Image]</td>
<td>56</td>
<td>1293</td>
<td>XT - 346 Kb</td>
<td>74,904 fct</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1208 kb</td>
</tr>
<tr>
<td>![Model 3 Image]</td>
<td>394</td>
<td>7596</td>
<td>NX – 48 Mb</td>
<td>313,160 fct</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4427 kb</td>
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<tr>
<td>![Model 4 Image]</td>
<td>1,240</td>
<td>48962</td>
<td>NX - 35 Mb</td>
<td>1,371,113 fct</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>22521 kb</td>
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<tr>
<td>![Model 5 Image]</td>
<td>331</td>
<td>4390</td>
<td>NX - 20 Mb</td>
<td>184,024 fct</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5672 kb</td>
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<tr>
<td>![Model 6 Image]</td>
<td>9</td>
<td>346</td>
<td>NX - 1.45Mb</td>
<td>10,447 fct</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>355 kb</td>
</tr>
</tbody>
</table>
PLM Vis and the JT Universe

- **What is it?**
  - Teamcenter Visualization, Community, Enterprise, Engineering
  - Applications where JT visualization is pervasive
  - Provides visualization, collaboration and management for JT formatted Data
  - End users

- **What does it enable?**
  - Component Technology
  - Embed visualization of JT formatted data in your application
  - Level playing field

- **Availability**
  - End users

- **PLM Vis**
  - Level playing field

- **JT Open Toolkit**
  - SDK + Business model
  - Enables read/write of JT data. Part of the PLM Open Platform.
  - Level playing field

PLM Vis complements the Teamcenter Visualization products
UGS’ common visualization component technology

- Teamcenter Visualization enabled through PLM Vis:
  - Teamcenter Manufacturing
  - Solid Edge Insight Connect
  - Teamcenter Engineering
  - Teamcenter Enterprise
  - Teamcenter Community
  - NX/XpresReview
  - iSeries
  - JT2Go
Solid Edge – Insight – View and Markup

- View/Markup PDM integration
- Supports measure and native Solid Edge, NX viewing
- Solid Edge development customized with their own functions
- PLM Vis accelerated the development of Insight Connect
- www.jtopen.com
- PLM Vis provides the gallery
- Leverages lightness of JT
- 10 days to implement
- 35MByte CAD data displayed in 470KByte of JT
JT2Go – JT viewing for everyone

- No Charge, JT viewer
- Built with PLM Vis, same core as Teamcenter Visualization
- Natural upgrade path to Teamcenter Visualization
- Reads PLM XML CGM, TIFF
- Trial Measure and Cross Section
- View Microsoft Office JT documents
- JT Open Edition
  - Available to full JT Open members
  - Markup and Measure included
  - Publish Microsoft Office JT Documents
PLM Vis in MS Apps
JT2Go – JT Document export to MS Office

JT2Go - export to PowerPoint, Word, Excel.
Capabilities

- Electronic design/review solution
  - Both Publisher and Viewer
  - Packages data for collaboration
- Free download for viewing
- Markup/Measure/PMI/Section
- Publish models and drawings from NX
- Solid Edge supplier viewer
- Any data can be added to the packages

Why is this important

- Collaboration beyond the enterprise that is cost free down the supply chain
- Rich bi-directional information exchange without an NX license
- XpresReview publisher shows NX user exactly what supplier will see
- Complete package that includes any supporting documentation in a single email attachment
Client Successes
In-house development

Shop floor application

Dirty environment, no mouse, no keyboard

Use TC Vis, Engineering and Pro-E in harmony. “Open by design” at work.

Example of PLM Vis and TC Vis complementing each other

Simple user interface, modelled on the VCR

Application walks animations, demonstrating “how to”
In-house development
Shop floor application
UG NX user
IExplorer leveraged to facilitate data accessibility/distribution
Electronic manual is always current.
Thumbnail images provide visual indexing
Targeted user interface. Easy to learn.
Cost effective desktop solution
Application walks animations, demonstrating “how to”
Simulation

- In-house development
- Parasolid/PLM Vis combination
- Highly specialized defense application
- No commercial equivalent available
- Supports Java and ActiveX
- Able to read a variety of formats including JT, UG NX and Parasolid XT
PLM Vis frees customer to concentrate on core competency

Customer retains total control over the look and feel of the application

Added new formats without having to write a single line of code to interpret the data.

Displays every popular 2D format as well as the 3D formats JT, UG NX, and Parasolid XT.
Medical specialist collaboration

- Collaborative Application
- Production of orthopaedic implants
- Author with UG NX
- Often collaborate with surgeons to verify the fidelity of an implant
- Surgeons can log in over the Internet and use an ordinary IE explorer that automatically downloads PLM Vis and provides a customized view of the data
- PLM Vis’ view markup capabilities provide surgeons the means collaborate and critique the implant design
2D Design

- PLM Vis supports all the popular 2D data formats
- Another example of extending Internet Explorer
- Cost effective desktop solution
- Targeted user interface. Easy to learn
PLM Vis increases productivity

- Components that add visualization
- Extend in-house applications, IExplorer
- Portable – ActiveX Controls as well as JavaBeans
- High level abstraction – develop in days not months
- View markup, navigation, simulation, sectioning…
- Supports view/publish paradigm
- Rapid deployment means fast payback