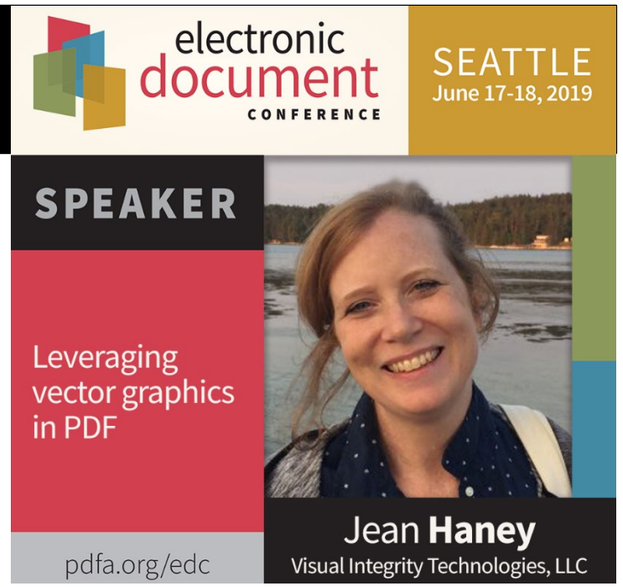
electronic document CONFERENCE

Vector PDF

Leveraging the Vector Objects in PDF files

Why Me?



- Co-founder and CEO of **Visual Integrity**; now in our 26th year
- Specialized in PDF and vector graphic technologies – conversion, creation and object access
- Experience with a broad array of customers across industries – end-users and developers alike
- Solution oriented

VisualIntegrity®

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Workshop Goals

- Set the Stage - Vector versus Raster – What's the difference
- Leveraging Vector Content
  - End-users - Editing PDF content in PowerPoint, Visio and CAD programs
  - Integrators - Workflow PDF Solutions & Automation
  - Developers - Access and work with vector PDF objects in applications and services
- A glimpse toward the future

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Vector vs. Raster

How to Know the Difference

What is Visual Information?

- Forms
- Mechanical, Electrical, and Architectural Drawings
- Flow Charts
- Organizational Diagrams
- Business charts
- Financial Charts
- Reports
- Maps
- Scientific Plots
- Schematics
- Technical Illustrations
- GIS
- Equations
- Line Art
- Logos
- Floor Plans
- Network Diagrams

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Vector vs Raster

- Scanned documents are **raster PDF** files
- Computer-generated documents are primarily **vector PDF files**
- Why "**primarily**"?

VECTOR

- Fonts/text
- Graphs & charts
- Call-outs & block quotes
- Logos
- Drawings & schematics
- Tables

RASTER

- Photographs (raster)
- Screen snips (raster)
- Original art (raster)

Vectors –draw/objects
EPS, WMF, SVG, DXF, DWG, HPGL, CGM
Line art, technical drawings, logos, illustrations

Raster – paint/pixels
PNG, JPEG, TIFF, GIF, BMP
Photos, scans, blends

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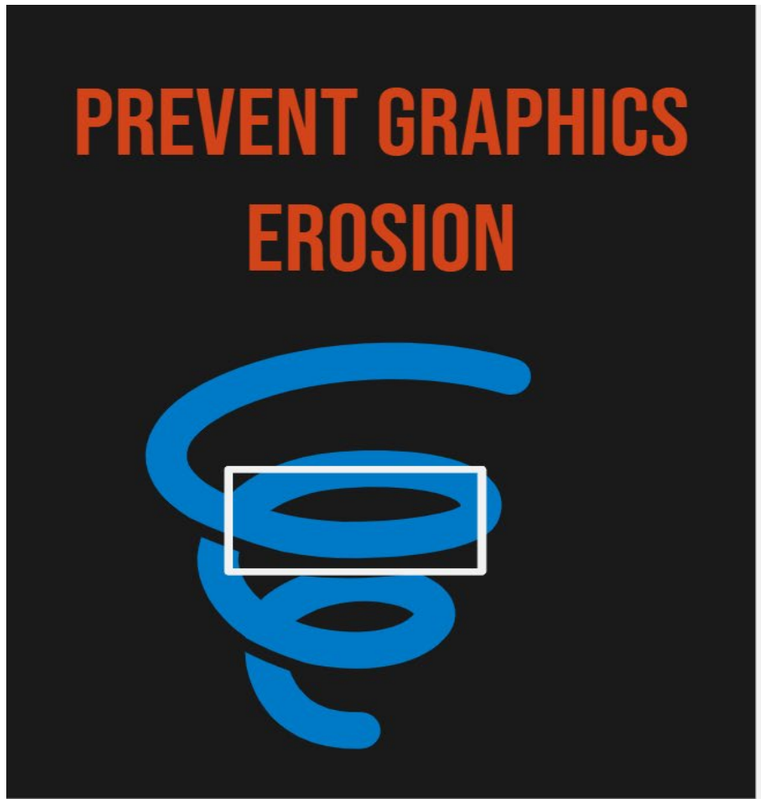
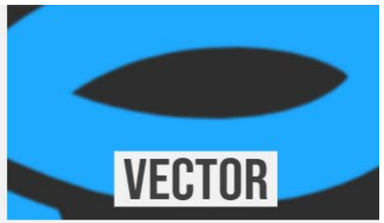
Maximize Your Vector Content

- Ideal for Document Management, Exchange and Display
- The moment a graphic is saved as a bitmap, all “intelligence” is lost.
- Vectors are:
  - Device independent
  - Resolution independent
  - Simple to edit
  - Searchable
  - Actionable
  - Intelligent
  - Precise





VECTOR GRAPHICS
ARE CLEAR & CRISP
NO MATTER HOW
LARGE OR SMALL.

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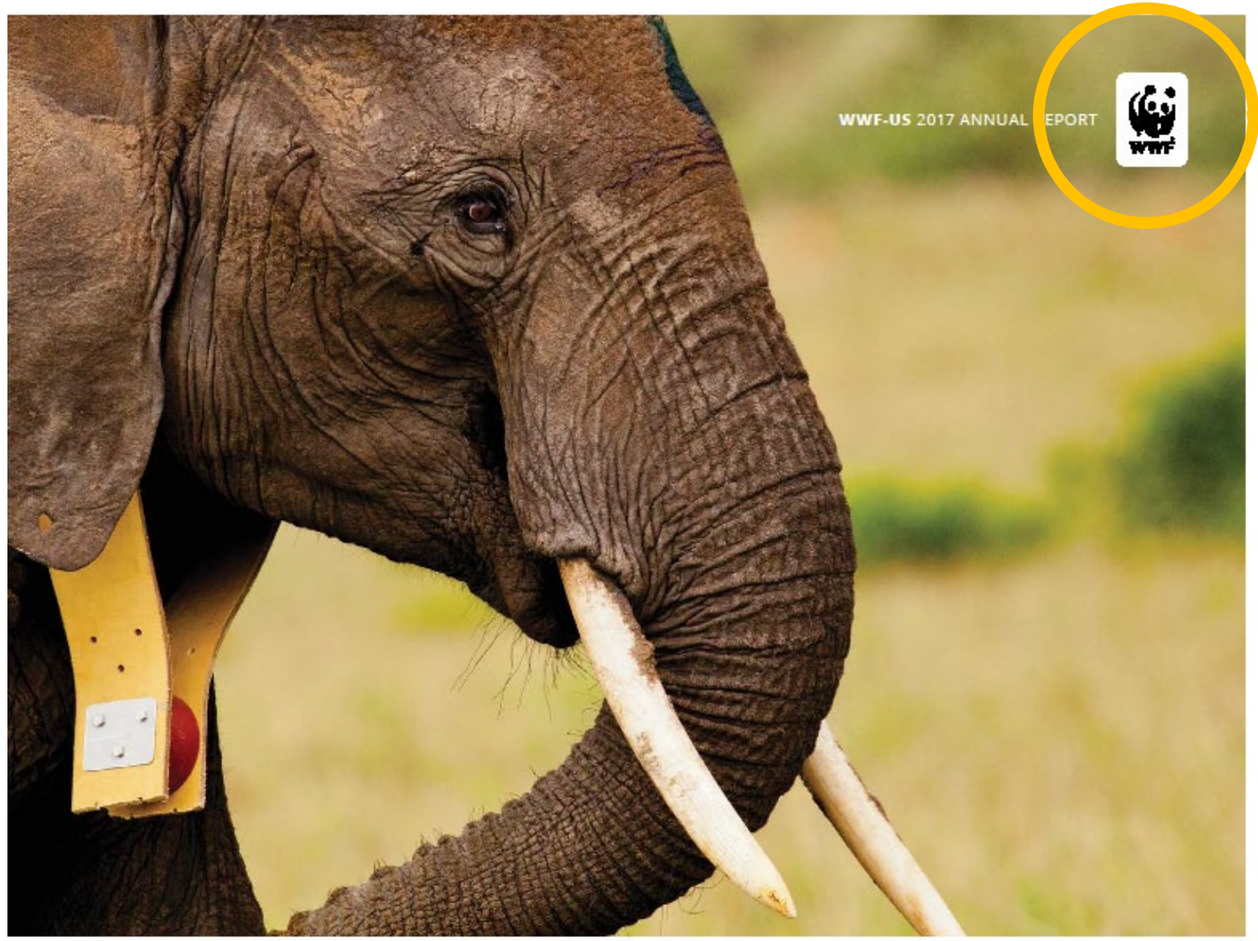
End-User Examples

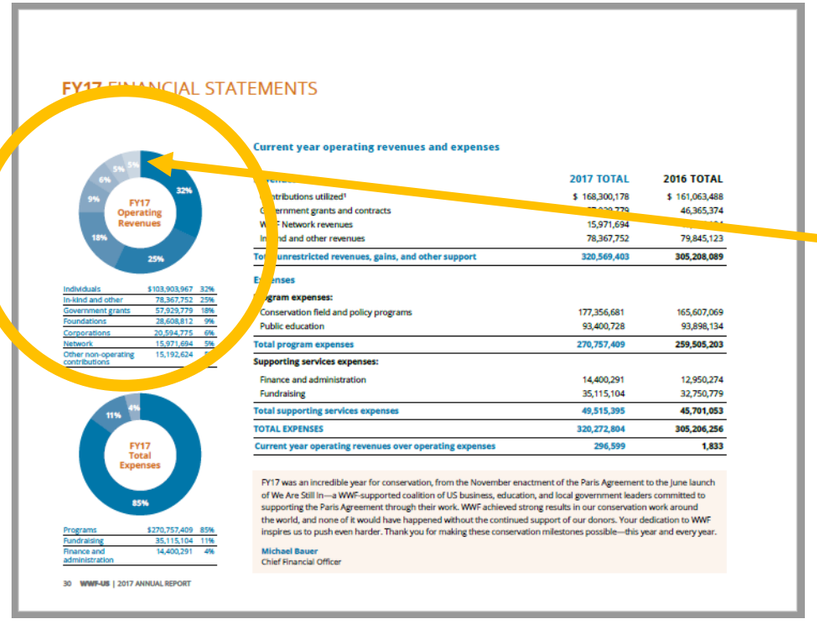
Ways to leverage the rich vector content in PDF files

PowerPoint | Visio | AutoCAD

Access High Quality Original Graphics



cover



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Source: WWF-US 2017 ANNUAL REPORT.

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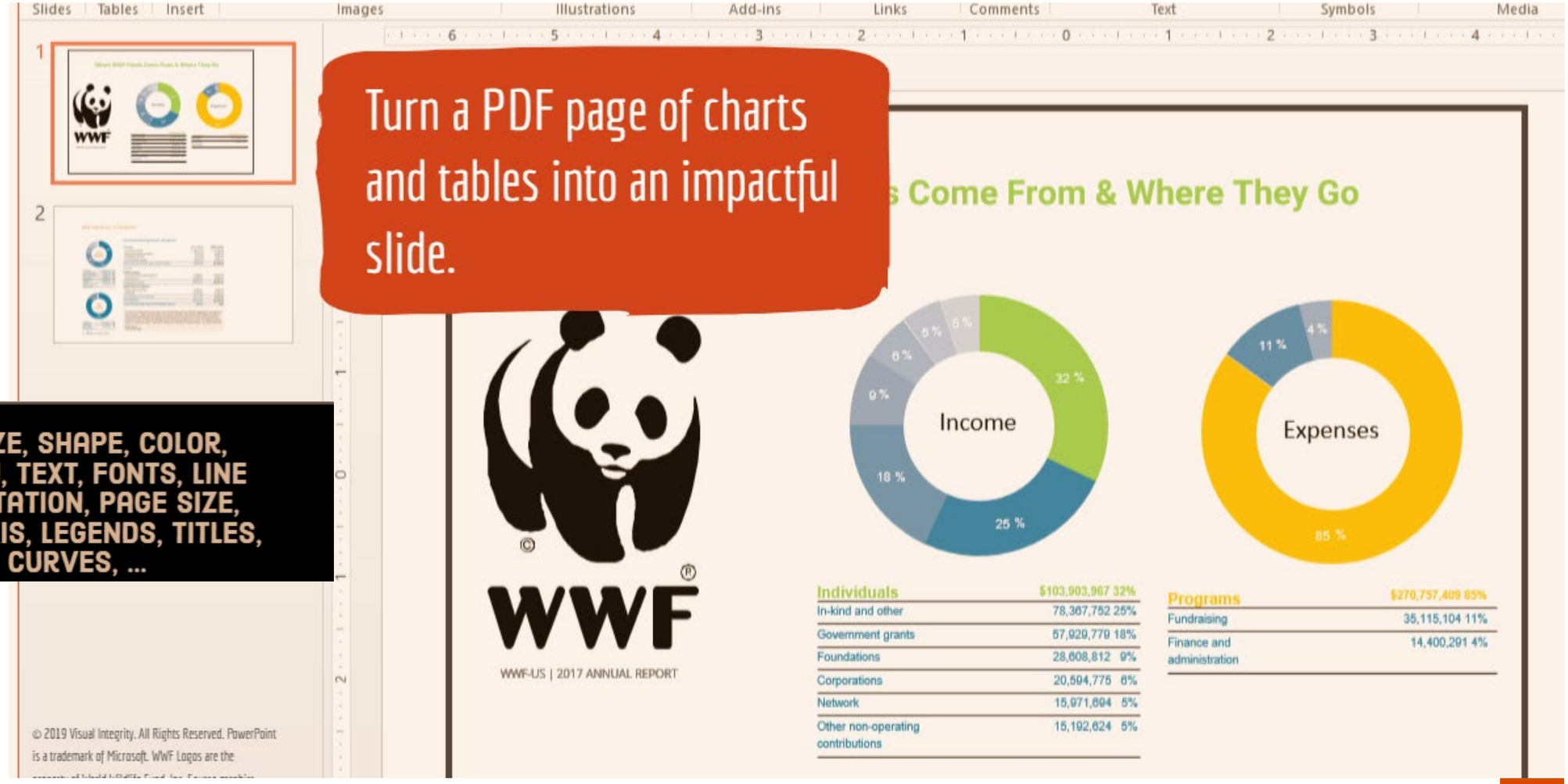
Use Vector PDF Graphics in PowerPoint



CHANGE SIZE, SHAPE, COLOR, ORIENTATION, TEXT, FONTS, LINE WIDTHS, ROTATION, PAGE SIZE, PATTERNS, AXIS, LEGENDS, TITLES, GRID, CURVES, ...

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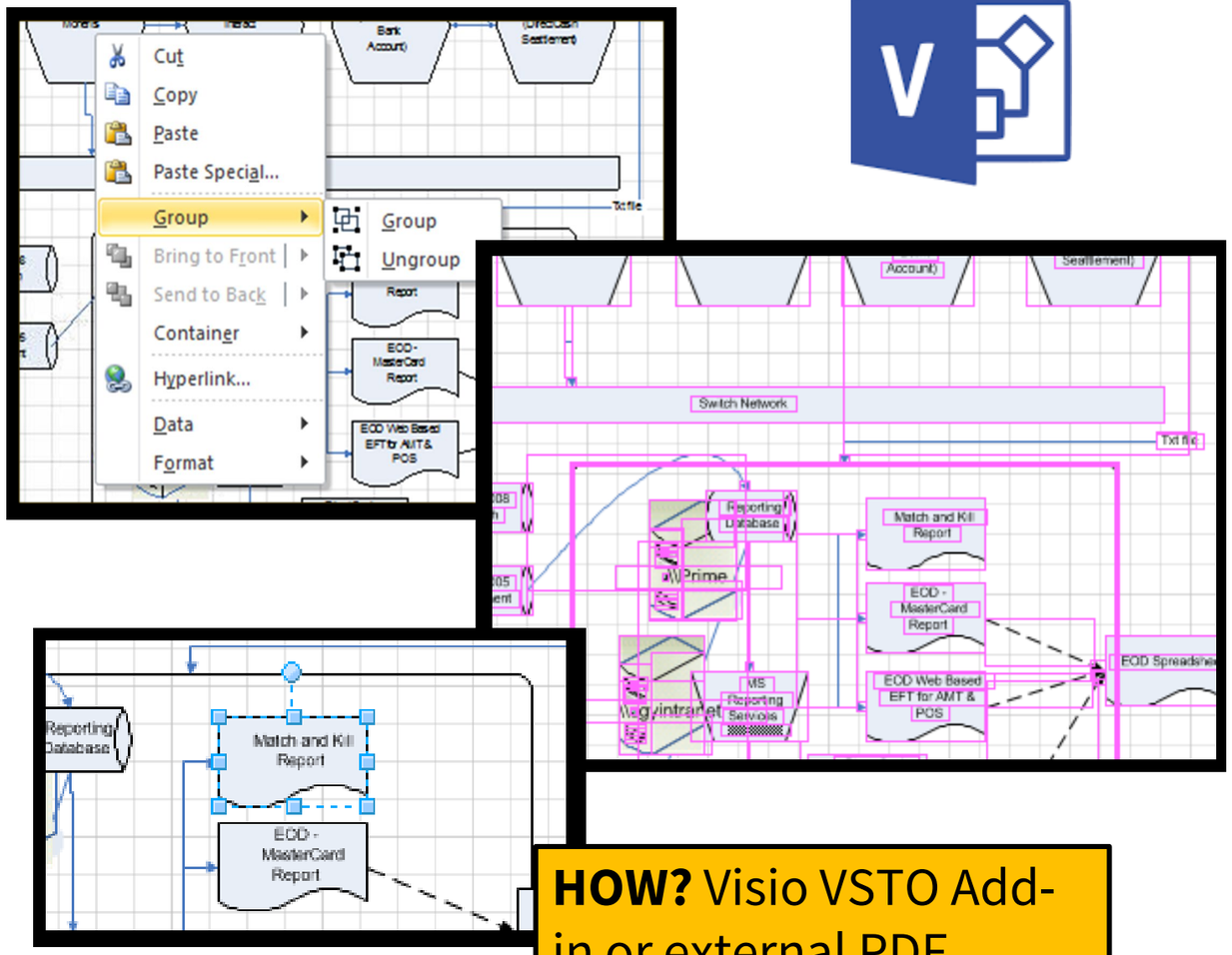
A short demonstration

Using PDF in Visio®

- Open PDF drawing as an editable Visio diagram
- Specify page to open from multipage file
- Scale to drawing or to page size
- Emulate PDF cropping
- Rotation
- Editable text with kerning and font substitution
- Recognize ellipses/circles
- Ignore images



HOW? Visio VSTO Add-in or external PDF conversion to WMF/SVG

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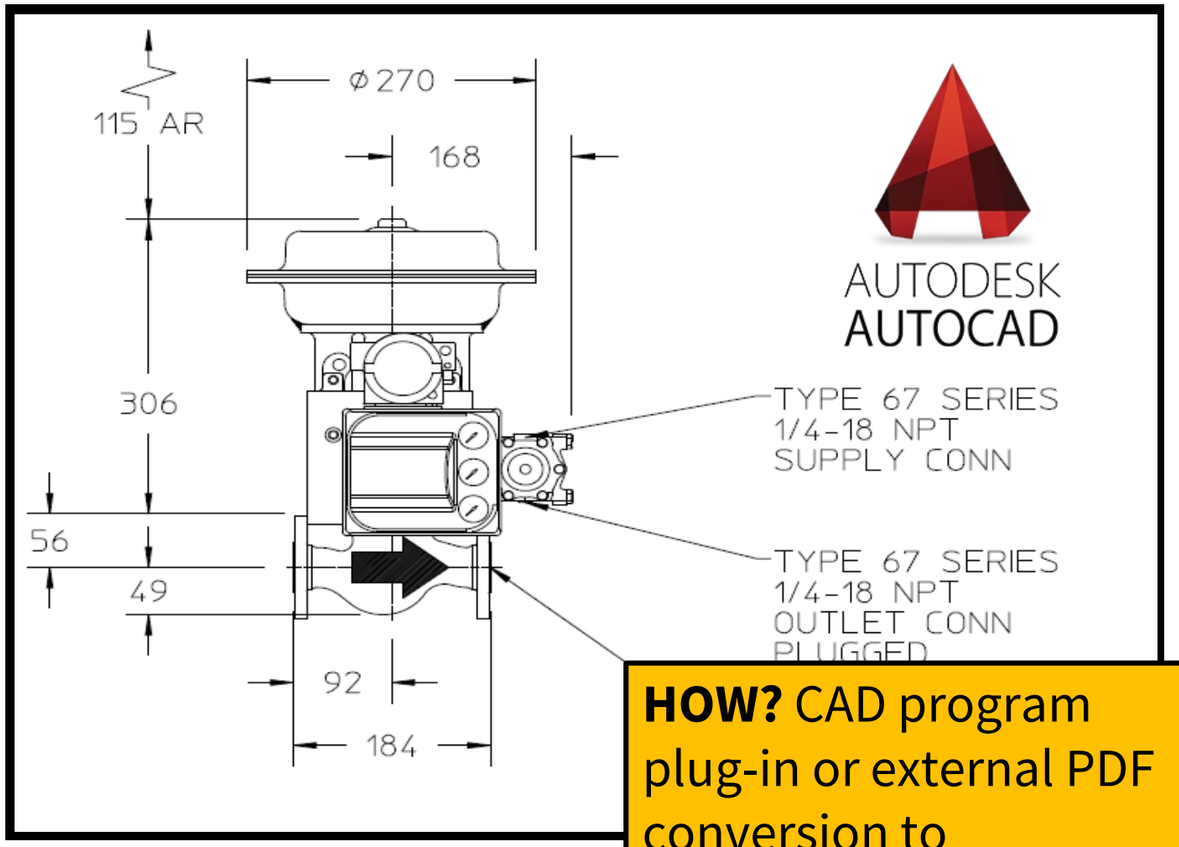
Using PDF in AutoCAD®

- Open and edit PDF drawings in any CAD/CAM program (DXF/DWG/HPGL)
- Specify scaling factor (model space vs paper space)
- Extract drawings from multipage PDF files
- Recognize compound objects with adjustable error tolerance
- Render paths as polylines/polygons
- Recognize dashed lines
- Map custom line styles
- Adapt line widths
- Ignore paths, text, images
- Keep or remove 3D effects
- Adjust format incompatibilities (PDF white fill = DXF black fill)
- Separate layers based on attributes in the PDF file (color, line weight, spot color, PDF layers, mix)



HOW? CAD program plug-in or external PDF conversion to DWG/DXF/HPGL.

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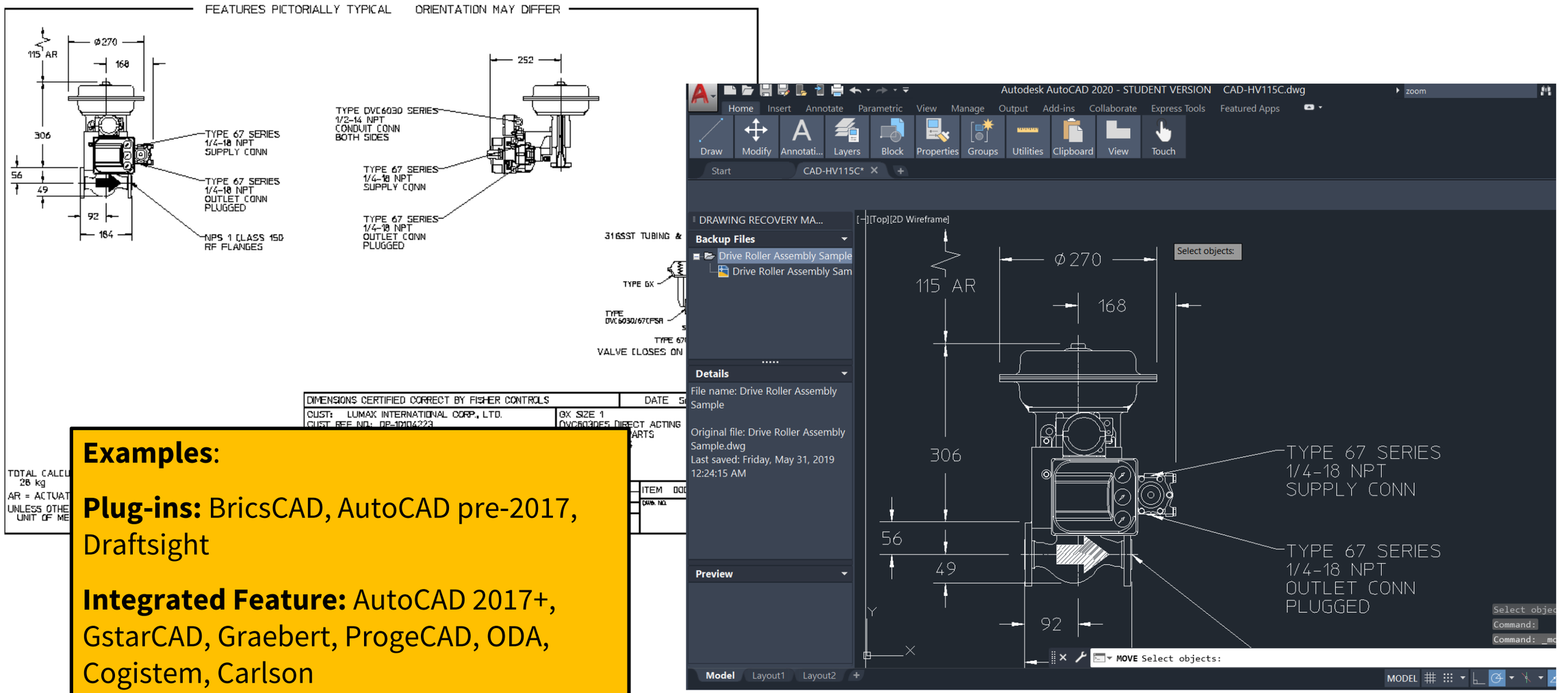
Using PDF in AutoCAD®



Examples:

Plug-ins: BricsCAD, AutoCAD pre-2017, Draftsight

Integrated Feature: AutoCAD 2017+, GstarCAD, Graebert, ProgeCAD, ODA, Cogistem, Carlson

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Servers & APIs

Ways to leverage the rich vector content in PDF files

Workflow | Developers

Workflow & Automation Servers (CLI)

Live Content
SDL LiveContent is an dynamic and interactive technical publication viewing engine meeting commercial and military data standards. PDF graphics are inserted as EPS to neutralize font issues.

SDL Live Content Example
Equations in PDF-based FDA submissions are converted to EPS insuring accuracy. For example, unknown and custom fonts are rendered as Bezier curves to ensure WYSIWYG integrity while maximizing searchable text.

Document Design and Delivery
PDF is converted to WMF/EMF for data driven, high volume mailings incorporating graphics and accurately placed text (checks/statements).

Technical Publishing
LinkOne Publishing and Viewing System. Converts PDF (EPS & AI) graphics into Windows Metafiles for production of parts catalogs and other technical publications.

Technical Publishing
Convert PDF and PS files into SVG and EPSF for their Technical Documentation System.

Technical Publishing
Technical documentation system, using browser to view PDF/EPS drawings as SVG.

Document Services for Healthcare providers
Manage and print high-volume database-generated print streams for customers who provide 10k+ page PDF pages per job. WMF/EMF for automated printing. ASCII text is extracted in parallel for data management.

Print Ready PDF
Export high-volume, >10k page PDF mainframe reports into equivalent text forms (max 132 char/line). Text to PDF (ASCII/ASA encoding), adding logo.

Reporting Workflow
Oracle Reports to SVG for Financial Portfolio Analysis

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PDF Conversion APIs

- Convert PDF (EPS/AI/PS) to other vector formats, image formats, text formats
- It's becoming a checklist item to add support for PDF import/edit in commercial applications
- Conversion is not always straightforward; compensation for differences in PDF/target formats must be considered
  - PDF cropping
  - Line type definitions
  - Layers
  - Fonts

+ Gräbert CUSTOM CAD

PDF Import/Edit Functionality
Open and edit 2D PDF files as CAD-standard DXF and HPGL formats. Access object data for snapping to underlay.

DraftSight™

Plug-in to open PDF drawing
Open a PDF drawing for further editing in Draftsight. As a plug-in program, it provides additional revenue opportunities.

iECHO 爱科科技

PDF for Laser Cutting
iECHO added PDF as an input format for their high speed digital cutting system through PDF to DXF (their native format) conversion.

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PDF Creation APIs

- Create PDF Files from “scratch”, Data, Text, Print Streams, PostScript, EPS and PDF
- Modify PDF
  - Add content (Corporate graphics, logos)
  - Extract Pages
  - Merge
  - Combine
  - Stamp
  - Watermark

It’s your choice!

For routine documents, there are lots of good open source and commercial PDF Creation API’s.

BUT!

Vector graphic intensive documents need special attention to ensure WYSIWYG accuracy.

NORGES BANK

Pump Charts with Added Graphics to PDF

The National Bank of Norway feeds economist’s PS/EPS charts and graphics from various analytical tools (MatLab, EViews and MarketMap Analytical database into their production system to produce PDFs for presentations/reports, EMF for MS Office charting and PNG(or SVG) for Web. Page numbers and their logo are stamped on all documents.

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PDF Object Access APIs

- Deep Level Control for Preprocessing PDF files
  - Extract or search for objects on a page
  - Create a conversion engine with no intermediate step or print driver
  - Find text object strings
  - Perform operations on object data
  - Delete object data
  - Change attributes of object data
  - Snapping

OpenDesign alliance

The Equalizer for CAD Development

Snap to PDF Underlay
Uses PDF Object Access API to support PDF underlays and clipping. Support attachment of PDF files to CAD drawings and then snap to the geometry stored in the file specifying location, scale and rotation.

GstarCAD

Map internal format to ODA object database
As an Open Design Alliance member, GstarSoft uses the ODA platform to render CAD drawings. By importing the PDF file into the ODA object database in memory, they can access objects, improve performance and implement features such as snapping.

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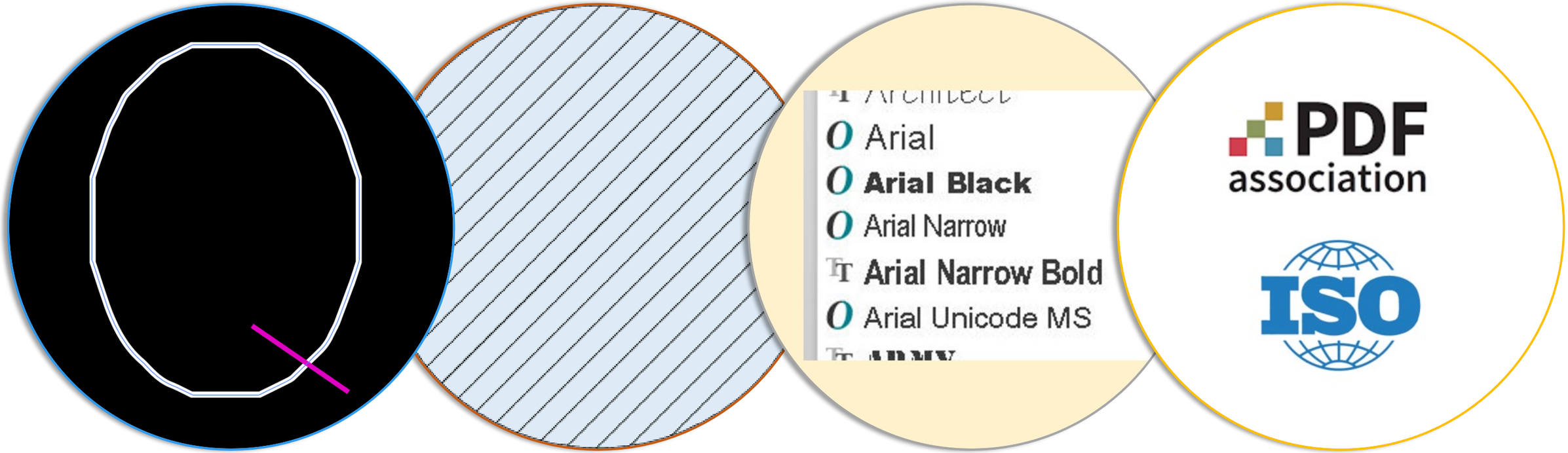
What’s Ahead?

A glimpse towards future possibilities for vector PDF

Short-Term Vector PDF Developments



Plotted Text Recognition
Plotted ==Vector

Recognize Hatch Fills

Intelligent Font Variant
NAME Recognition

Compliance with Evolving
PDF Standards

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Vector Search & Action

- **Problem**: Organizations have a wealth of information locked inside in their PDF-based visual content. Mining it will lead to better business intelligence, streamlined workflows and result ultimately in an increased competitive advantage.

- **Solution**: **Search & Action**
  Visual content mining needs a platform/API that enables the enterprise to use the intelligence stored in their visual content (through facilities for retrieval, viewing, discreet “search & action”, dynamic modifications, analysis, publishing and more) to find, correlate, analyze and publish results.

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Two Parts to the Platform

- Prototype examples developed with grants from the Netherland Government's Innovation Fund
- Two Parts:
  - Compound Object Recognition
    - Pin-point specific objects within files
    - Recognize object orientation and size (scaling)
  - Object Query Language will integrate into databases, content management systems other repository systems
    - Dynamic Functions
    - Allows data driven graphics, merging of files, stamping, watermarks, etc

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Thank You!

Questions?

If we have time, I welcome them now.
Otherwise, please find me during a break today.

To contact me after EDC 2019:

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