



PDF Days
Europe
2025

When PDF is production critical

What can other industries learn from an industry
that relies on PDF quality?

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Overview

- **Prepress, print and PDF (intro)**
- Dealing with production critical PDFs
 - PDF - File format requirements
 - PDF/X and GWG – PDF based print specifications
 - Business logic - Workflow requirements
- Automation
- Outlook

Very high level print business development, since 2020

- Publishing (magazines, newspaper etc) 
- Commercial (flyer, business cards etc) 
- Variable data print (VDP)
(invoices, mass mailings etc) 

- Textile (fashion, wallpapers etc) 
- Display and Large Format Print (LFP) 
- Label and Packaging 

Print – general business considerations

- PDF is the input format for all print products
(minor vanishing exceptions for textile and variable data)
- Customer is the supplier of the input (PDF)
=> Complicates ensuring quality of input data
(education has proved to not work)
- While the total number of all printed substrates may decrease
the total number of all printed PDF pages increases dramatically
=> Automation (“dark room” processing) is a must

PDFs feed printing machines

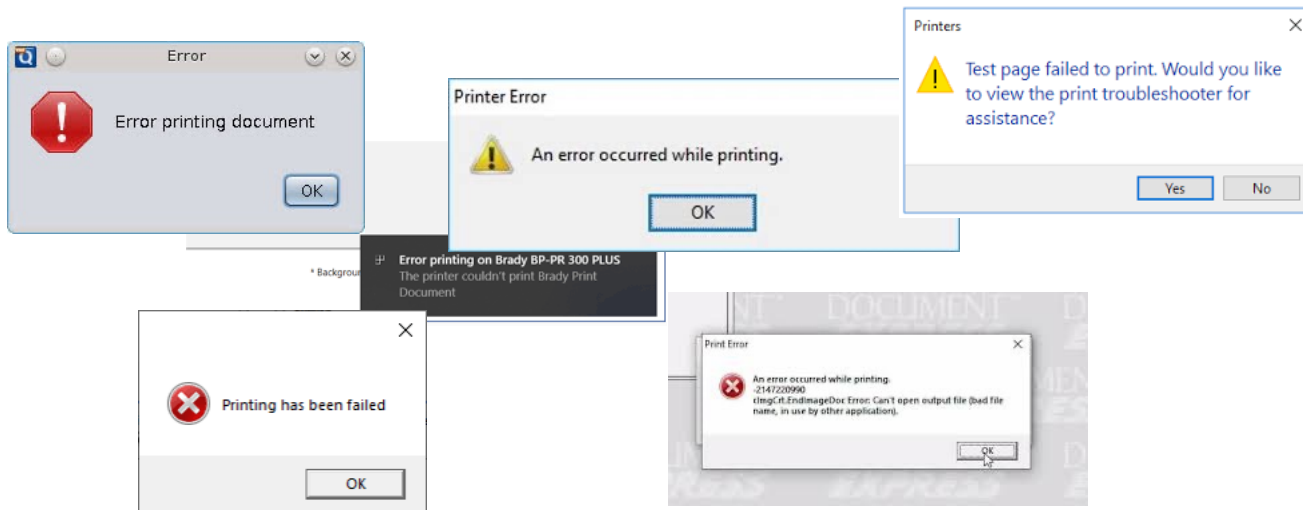
- Average number of prints
 - Conventional (offset): above 5,000 clicks (prints)
 - Digital: below 2,000 clicks
- Number of PDF pages printed per hour
 - Sheetfed offset: ~ 50 pages (imposed on a sheet)
 - Digital toner: ~10,000 pages
 - Digital high speed ink jet: ~100,000 pages
- Downtime cost for a digital printing machine
~ €1,300/hour

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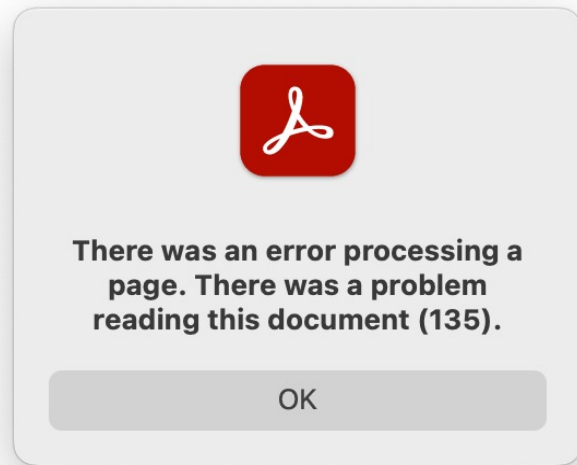
Avoiding RIP / print issues

- Validity of the internal structure
- Completeness of the internal structure



Issues with the “valid PDF” requirement

- Customer is king
- Many internal structures are not important for rendering
 - Metadata
 - Tagging
 - Bookmarks (outlines)
 - File specifications
 - Text (unicode)
- Others are only sometimes important
 - DPart
 - Layers
 - Annotations
 - Forms / Signatures



Frequent production critical PDF issues

(Based on an internal analysis of customer cases)

- Incomplete images (most frequent)
- Missing indirect objects
 - Fonts
 - XObjects
- Invalid compression filters in inline images

PDF validation?

- Using Arlington
 - Machine-readable data model of all PDF objects
 - Developed by the PDF Association
 - Open
 - Can be adjusted to error only on objects that are relevant for rendering
- But: The structures that matter would require analysis of streams...

Not covered by Arlington

None of the frequent issues are addressed:

- Incomplete images (most frequent)
- Missing indirect objects
 - Fonts
 - XObjects
- Invalid compression filters in inline images
- => More useful for PDF creators, not so much for prepress / processors

How to deal with invalid input PDF: Checking

- Identify and analyze issues in customer files
 - Read content streams (invisible, 'strict' rendering)
 - Analyze structures of all streams mainly fonts, ICC profiles
- Not the best solution:
What to tell the customer?
 - Re-create it?
 - How?

How to deal with invalid input PDF: Fixing

Fix known issues in the internal structure wherever possible

Ongoing task for PDF software vendors

1. Identify and analyze issues in customer files
 - Read content streams (internal 'strict' rendering)
 - Analyze structures of all streams mainly fonts, ICC profiles
2. Implement fixes for known issues if unequivocally possible

Processable input PDF – performance

- Processing speed is often similarly critical
 - High cost of “unused machine”
- Indications
 - Many objects in a certain page area (often created with CAD applications)
 - > 1300 transparent objects
- Measuring issues is often slow too, smart approach required
- Fixing: Pre-rendering

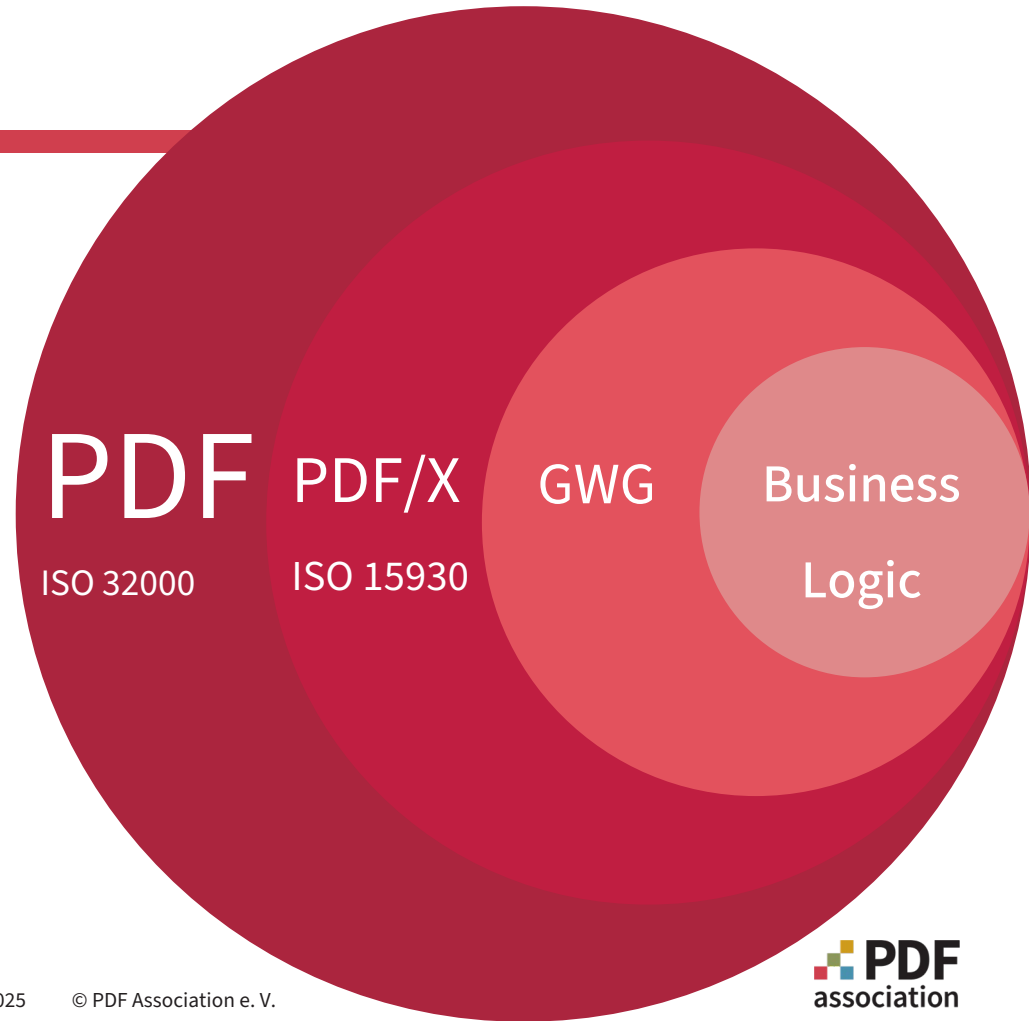


Processable input PDF – performance special case VDP

- Variable data print issue #1
 - Reused content is not part of a form XObject or interferes with dynamic content (e.g. via transparency)
- Fixing: Introduce new form XObject structure

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PDF/X: base requirements

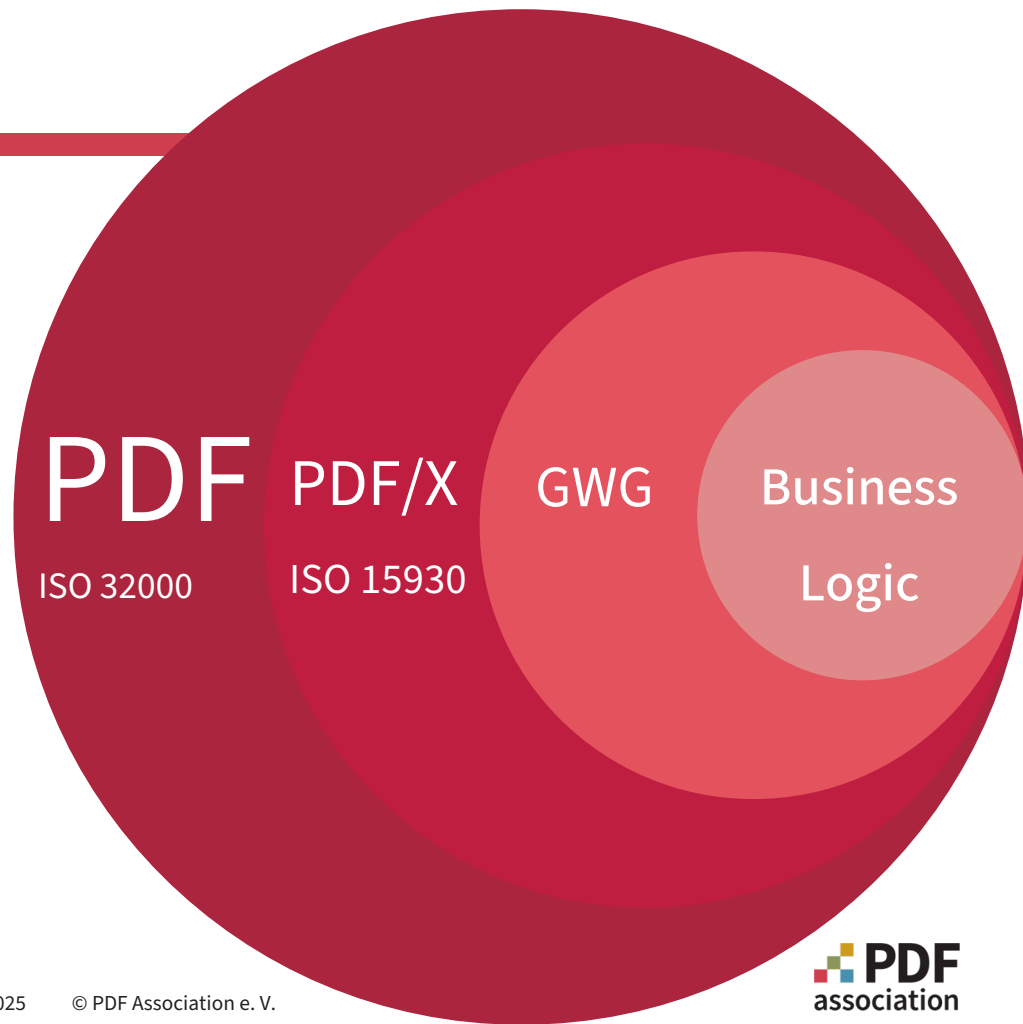
- Completeness and device independence
 - Fonts embedded
 - Color device independent defined
 - etc
- Often used by “educated” customers/suppliers
- Fixing often clear, only rarely hard: eg. if font is missing
- No encryption
- PDF/X-4 allows for transparency!

GWG: specific requirements for print methods and products

- Based on PDF/X-4
- Sets of additional requirements
(34 variants)
 - Image resolutions
 - Color spaces (spot colors, RGB colors etc)
 - Processing Steps (ISO 19593) specification
for label and packaging
 - ...
- Often not directly used but as a basis for custom checks

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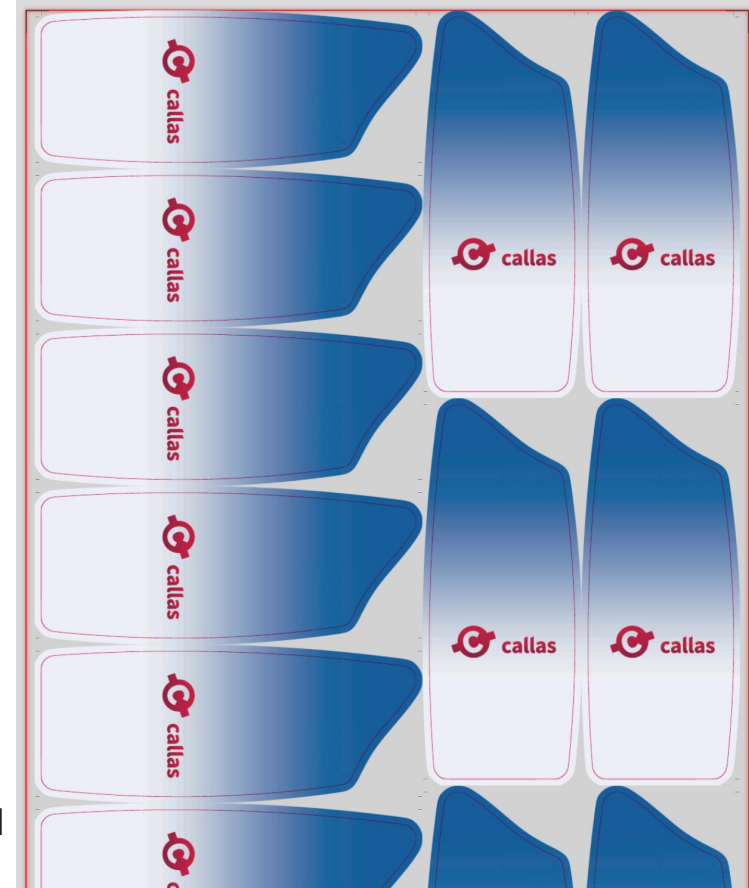
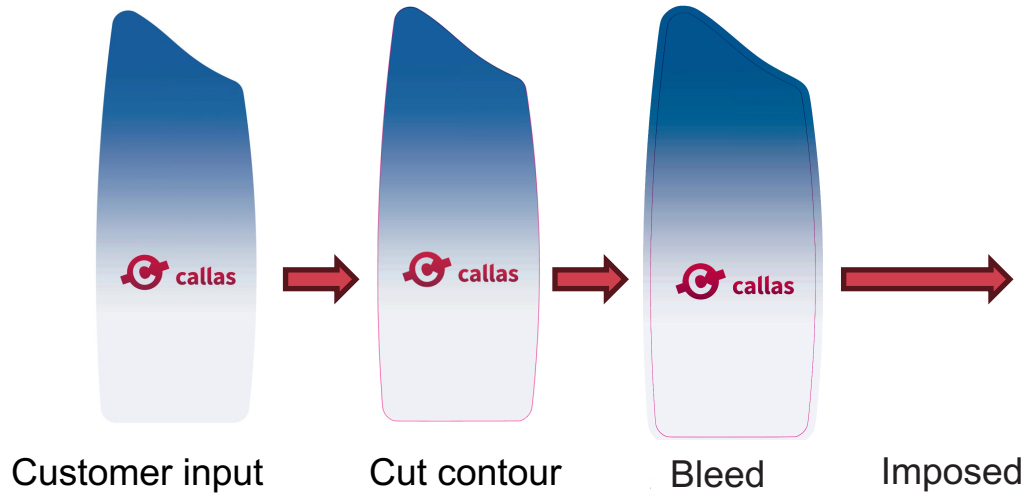


Job and internal Workflow requirements

- Color adjustments to respective output device
 - ICC based to printing machine
 - Spot color to CMYK
- Cutlines for specific cutter
(several cutting technologies with different requirements exist)
- Imposition

Job and internal Workflow requirements - example

1. Create cut contour
2. Generate bleed
3. Impose



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Automation

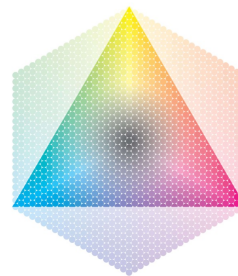
- Automation need is a given (business reasons)
- Preparing PDF for print is a complex task with many interdependencies (PDF, job, workflow requirements)
- Rules for automation engine are complex and require knowledge and experience with the production process
- Human resources setting up the engine are not programmers
- Checks and modification instructions are set up using „Low code“ UI combined with variables for flexibility

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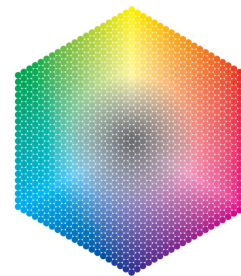
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Outlook

- HDR images (high dynamic range)
- Multichannel (CMYKOVG) transparency interactions
- New tools for PDF creation
 - Adobe Express
 - Canva?
 - => See and hear next session



CMYK



CMYKOVG



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When PDF was production critical:

Feedback, suggestions, questions or ideas?

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