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Transform Your Print: Making Something New Out Of Something Old

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Howard Turetzky

InfoPrint Solutions Company

howard.turetzky@infoprint.com

Agenda

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- What are Transforms?

- Why use Transforms?

- Transform Inputs

- Transform Issues

- Where does the Transform run?

- Where does the Output go?

- Configuration and Execution

- What Doesn't Translate

- Summary

What Are Transforms?

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- Convert Documents Between Page Description Languages (PDLs) or Image Formats
  - Typical PDLs
    - AFP, line data (text), PDF, PCL, PostScript™, LCDS/metacode
  - Common Image Formats
    - JPEG, TIFF, GIF, IOCA

Why Use Transforms?

- Repurposing: A different use than the original was created for

    - From print to web

        - Online bill presentment

        - email

    - From print to archive

        - Reprint for customer service or legal

        - content protected from alteration

    - From Print to Print

        - Merge unlike PDLs into single target stream

Why Use Transforms?

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- Hardware
  - Inexpensive printers don't print AFP or PostScript™
  - Less expensive to print on fast AFP printer than inexpensive printers
- Viewing
  - AFP viewers are limited in function
  - Viewers for PCL, LCDS/metacode are expensive
  - PDF viewers are free

What Goes in?

- File or files to convert

- Resources
  - fonts, images, control information

- Setup instructions
  - describe, control, limit, define how the transform is work
  - define the output characteristics

Transform Output

- Transform Output: What Comes Out?
  - Text-based Output
    - Text is converted to a text form in the output PDL
      - Typically text characters in a font
    - Non-text converted to most similar format
      - Barcode to font, image, graphic
      - Image and graphics to image and graphics
  - Image-based Output
    - Document content converted to a single image

Transform Issues: Fidelity

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- Fidelity: difference between original and converted page

  - Printing

    - Ideally, original and converted output should be identical

      - Can come close when converted to page images

        - Resolution may affect size, quality and aspect ratio

Transform Issues: Fidelity

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- Text transforms limited by fonts and font metrics
  - Glyphs may differ due to font substitution
  - Line endings may move
- Resolution may affect appearance

Transform Issues: Fidelity

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- Non-text objects may not transform identically
  - Barcode commands (e.g., AFP BCOCA) may be transformed to image or lines
    - Printer generates optimal barcodes, conversion might not scan
  - Image conversions may change appearance and color

Transform Issues: Fidelity

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- **AFP original for print**
  - Uses printer fonts and rules
  - Heading layout for print and mailing
  - Fit to physical page

- **Repurposed for the Web**
  - Browser fonts and rules
  - Colored and live areas for navigation
  - Fit to browser window
    - Column widths, alignment altered

Transform Issues: Archive

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- Archive
  - Document metadata may not be transformed
    - Metadata is information about a document
    - PDL may not support equivalent information, e.g., Indexes, tags, active content (URIs, links)
  - Transform output must be complete with required resources
    - Some PDLs do not support external resource types
    - Archive system may require all resources inline

Transform Issues: Web

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- Web presentment
  - Document is repurposed
    - Live selection or other interaction
    - HTML cannot faithfully represent document appearance
      - Fonts, line spacing, image position
      - Pagination

Where Does The Transform Run?

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- Pre-spool: between application and print system
  - For example, program creates AFP line data, but transform puts PDF on the spool
- Post-spool: between print system and printer
  - For example, program creates AFP line data but printer only prints PCL
- Stand-alone command
  - Command line or batch job

Where Does The Output Go?

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- Output Destinations could be:
  - Spool
    - for printing
  - File
    - for further processing
  - Server
    - print, archive, mail
  - Printer

Configuration and Execution

- Performance
    - Pages per minute a useful measure
    - Transforms usually are CPU-intensive
        - Vendors seldom provide a measurement because they can vary widely depending on the data and system
        - Ask to test with your application

Configuration and Execution

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- Single execution vs. Multi-threaded
  - Batch or automatic execution may transform pages or documents in parallel
    - Page-parallel systems distribute groups of pages to multiple processes
      - Usually each process runs on its own processor
      - Only PDLs with independent pages are candidates: PDF, AFP
      - Common in printer controllers
  - Some systems can run multiple different transforms or multiple instances in parallel
    - Dataset-parallel, not page parallel
    - Aggregate thruput higher, but same for a single document

Configuration and Execution: Font Resources

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- Usually required
  - Fonts may be substituted or mapped
    - may not exactly match the original
    - encoding may not be the same
  - Or they may be converted
    - output file will be larger

Configuration and Execution: Image Resources

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- Images and formatting resources must be supplied
  - How does transform require them?
    - Inline
    - In a directory

Configuration and Execution: Other Resources

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- Name of formatting resources
  - Essential to correct conversion
    - FORMDEF, PAGEDEF
    - macros
  - Setup parameters
    - controls transform execution
    - affects output appearance

What Doesn't Translate

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- Some PDL characteristics have no equivalent in another PDL
  - Indexes
  - "Foreign" objects
    - transform may convert
  - Color mapping and management
  - Control objects
    - setup files, configuration controls

In Summary…

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- Know what the purpose of the output is
- Find out performance requirements
- Determine the level of fidelity
- Learn where all the parts needed for conversion are located
- Understand how to control output appearance

Questions??