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The Guide to...

Preproduction Data Management & Quality Control

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Digital Dots Technology Guides

The Guide to Preproduction Data Management & Quality Control

Second Edition

Digital Dots Technology Guides

The Digital Dots Technology Guides

This publication is part of a series of independent technology guides for publishers, graphic arts professionals, printers and print buyers. Technology Guide titles provide straightforward explanations of how technology works, what it's for and considerations for investment.

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About Digital Dots

Digital Dots is an independent graphic arts research and content development company established in 1999. The company is a collection of like-minded graphic arts consultants, pixies and professional journalists specialising in digital print production and publishing technologies. Digital Dots provides exclusive market research and content based on its own testing and evaluation services for prepress and publishing applications. It also publishes Spindrift, the industry's only independent journal for graphic arts news, analysis and comment.

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Introduction

Welcome to the Technology Guide to Preproduction Data Management & Quality Control

Companies use print because it works and fortunately print has become increasingly affordable. Costs have dropped and the value for money print represents has never been higher. Unfortunately print production is still a bit of a mystery for many people, even though easy to use software, standard platforms and generic data formats have made production more accessible. The problem with all this easy access is that too many people still haven't a clue about producing documents for a printing device, be that conventional or digital presses.

In the following pages we cover everything you need to know about preflighting and quality control. We explain how print media production workflows can be quality managed for efficient, automated production. Good housekeeping practises for print media production can help cut costs through delays and reworkings, and it's relevant for anyone in the print and digital media supply chain.

An understanding of basic working practices and how to resolve problems is what this Technology Guide to Preproduction Data Management & Quality Control is all about. It is intended to help printers, prepress professionals and their customers understand the importance of preflighting for print production. It can help anyone who buys print, from marketers to publishers.

Successful investment is about choosing the right technology for your business, but process automation is as much about workflow optimisation as it is about technology. It all comes down to providing the best service and process support for your customers, so we hope this guide helps you and them to better understand the process. We hope you find the Technology Guide to Preproduction Data Management & Preflighting useful and we welcome your feedback.

Preflight Reinvented

Everything changes and everything stays the same. We know less, forget more and need to keep track of truckloads of extra stuff, even though much of it is a complete mystery to us. Sounds familiar? Well, of course it will, if you're the dusty side of 30. But even if you're on the fresh and dewy side of it, the feeling should be familiar, especially if you're in the media production business. It's the fate of any workflow not kept in constant trim, and for many contributors to the digital supply chain, when it comes to file checking and preflighting, it's doing their heads in.

Preflighting. What a word. What does it really mean? These days rather less than it used to, unless you're a pilot or into your dusty post-30 slide. The term, originally borrowed from the aeronautics industry, refers to the collection of checks done to a digital data file or aeroplane, prior to sending it off elsewhere, be that to a production workflow or the runway. Apart from the security issues, not much has changed as far as checking an outbound aircraft's fitness for purpose, but for prepress production, much has changed, not least workflow expectations.

Preproduction & Preflight Checking

The whys and wherefores of how workflow has changed is a discussion best addressed over a ripe and ready Shiraz. What is less opaque and Shiraz-dependent, are the factors shaping the evolution of preflighting and production process management: standards, automated pagination and layout technologies, PDF's dominance in workflow management, the Internet, process audit requirements, people and job functions, competitive issues, cross media production, asset utilisation and protection, the list is endless. For this reason, preflight checking is about managing preproduction data for all parts of the workflow.

Not that the need for accurate Postscript and PDF processing has gone away. Producing accurate files isn't the shot in the dark it once was, but improvements in Postscript and PDF have rendered obsolete the need for blunt instrument data processing checks. Postscript and PDF evolution are intertwined with advances in digital workflow management, in step with changes in digital production. Thus the scope of data and process checking is considerably larger.

Whatever the application, from newspapers to packaging, it's all about managing print production more effectively, including all relevant equipment, skills, customers and costs. No longer can we speak exclusively of proofing workflows, platesetter workflows, or editorial, layout, asset management and archiving workflows. They all can, and increasingly do, share a digital foundation and the composition of this foundation determines data management requirements, not only preflight checking for individual output processing lines. This is where systems such as Agfa's Apogee and Delano technologies, Esko-Graphics' Scope and Web Centre, Fujifilm's Celebrant, Screen's Trueflow, Kodak's Prinergy and Dalim's Twist fit in the picture. However, they are largely production driven systems and do not yet fully reach all file originators' desktops.

The difficulty of managing efficient, automated dataflows is made worse by the fact that prepress production increasingly involves people for whom print production is a bit of a mystery and the language completely obtuse. The territory between ideas and their mass produced expression is no longer the exclusive preserve of prepress, hence the evolution of project management systems such as Delano

Afga's Delano was the first product of its kind to be developed for graphic arts project management. In the above example, it is being used for magazine production.

and Web Centre. Virtually anyone can, and does, create digital documents, ostensibly ready for full colour print. This is probably the single biggest reason that prepress production control has changed so dramatically in recent years. The rise in digital printing and on demand print media applications will complicate matters further.

The Workflow Reality Check

Preproduction data management efficiency is entirely shaped by the workflow and production goals, particularly in on demand models. It starts with understanding the scope of the workflow and where data management might improve matters, both directly and indirectly. Should one for example check PDFs or native application files or both? Should file checking be server or desktop based or both? Should the quality control system be open or closed? Is it production or file originators' responsibility or both? Is it enough to use plug-in utilities and extensions? Should the workflow's ethos be production or editorially determined? Who is responsible for what, and where in the workflow does responsibility shift to the next stage?

Whatever the answers and wherever you sit in the workflow, keeping the dataflow moving is the prime objective. It's even more important in distributed environments and for companies planning to implement JDF. Preproduction data management is of course one of JDF's central purposes, but we are still a very long way from realisation of that particular dream (nightmare?). In the meantime, effective data management is the route to production efficiencies, and the more people and processes involved, the trickier it will become.

Applications Development

Customer requirements are also changing. The art of printing may still be the preserve of the few, but document creation is definitely no longer confined to the niche that prepress used to serve. The desktop publishing revolution (a dim and distant memory even for the post-30 sliders), put publishing technology into the hands of the masses. Having it in their hands, the masses have used the technology wonderfully, and developers have kept pace. A few years ago some basic understanding of preflighting and quality control and their importance in the workflow was enough, but now prepress involves many and different resources, from pencils to presses, and everything in between.

Applications are getting more complex, but production understanding isn't always keeping

up, so many forms of print, such as marketing materials and sales collateral, are now produced by people who don't know or care about production processing. Composition, layout, image capture and processing, font usage, printability, finishing worries, and so on are not their primary concern. They are the concern of the system, and the IT department supporting their applications.

Changing Developer Landscape

Several early players in the preflight business have reshaped their business models to thrive in a rapidly changing market, where IT departments play such an important role. Many of those companies contribute technologies to the powerful workflow management systems offered by the leading prepress suppliers. For example Enfocus, Markzware and Onevision all started life as developers of Postscript checking tools and yet all three have extended their technologies to provide comprehensive workflow management utilities and extended their reach to the web. Enfocus Certified PDF is gaining serious kudos as a tool for quality control and file life cycle management. Enfocus' business is based on an OEM model plus direct sales, so this technology crops up in other systems. The company has updated all of its products to be fully compatible with Acrobat 7 and PDF 1.6.

Markzware's technology is increasingly used in web based file delivery and management, although often under the name of a Markzware customer. The company's Flightcheck Professional quality control software has recently been updated to support PDF 1.5, with improved speed and more robust OPI support, and such subtleties as user definable path searching and detection of application generated clipping paths.

Onevision hasn't been snoozing either, adding more functionality and sophistication to its technologies which, in the case of the Solvero editing and post processing tool, look more like layout management systems than preflight tools. Onevision's latest developments illustrate just how far preflighting has come, with controls over the amount of toner or ink used, automatic control of rich black and support for PDF standards such as those developed by the Ghent PDF Workgroup.

According to the 21,000 customers Readex Research asked in January 2006, Enfocus Certified PDF usage has increased to 60% compared to 30% in 2004.

Next Generation Workflow Developers

Established suppliers will clearly die before they get old, but they will have to contend with some new young hippies elbowing their ways into the business. A rising number of prepress services and repro houses are building bespoke systems, often using Markzware technologies, to serve their customers. Many have found they can sell their technologies to other companies and some have taken the idea to extremes. For example, Stibo, a Danish printing company founded in 1794, now has three divisions including CCI Europe, one of the great names in newspaper systems, and a software division responsible for all sorts of clever things. One such clever thing is Eprint for online production status viewing. This woefully dull sounding product is actually quite interesting, having been developed in conjunction with some of the largest European catalogue, directory and magazine publishers.

Few can match Stibo's ancestry but W&Co, Colour Systems, JJays and Atelier are some other good examples of poachers turned gamekeepers. All used to be pure repro houses, but of these Atelier with its Digital Publishing Desktop, a set of web applications for publishers has moved farthest from its repro roots. Atelier's technology is the basis of an automated online workflow service for customers, for example of Polestar, one of the largest printing companies in the UK.

By providing and helping to extend the links to the digital supply chain, all of these companies are edging their businesses into new territory. They are getting into the workflow management business by developing utilities to help their customers and of course, in order to keep them.

Where Will it All End?

What to expect for the future? Hard to say, but with printing and finishing the most stable part of the production process, the emphasis will obviously be on preproduction improvements. Efficient IT management is the ultimate driver for efficient digital prepress, so looking at the stampede to digitisation, asset management, versioning and usage tracking are the next logical extensions to current workflow models. Data management is not the same as asset management, so we would also expect to see more sophisticated anticipation of potential problems in the mechanics of production data and file management, particularly for distributed profile driven and colour managed PDF workflows.

We also expect preproduction management to support the increased consolidation in print purchasing, through tighter links with distributed MIS and content databases. Large companies are starting to consolidate their print purchasing, not to use print less, but to use it more effectively as part of their media strategies.

Increased regulation and compliance will also encourage the trend towards in-house management and control. For technology developers, workflow systems will have to have considerable scope to interact with datastores, on and offline, plus manage file distribution and delivery, communications and relationships with service providers such as agencies, and internally.

Managing the mechanics isn't just about data, so workflow management will need to manage complex and distributed resources, such as presses and platesetters, with load balancing across related hardware and software, and even skills and distribution options.

Although we've a development community bordering on the fanatic in their efforts to help smooth the paths of production data flows, mayhem lurks snarling all too close. It will get worse as the printing and publishing industry starts to work with variable data output and on demand production. Web based proofing, distributed production modes, compliance management, standards implementation including, PDF/X-1a, PDF/X-3 and ICC standards, multiple format support, profile management; all are turning what used to be a collection of discrete and manageable tasks into a digital rat's nest. Yet we still refer to it as workflow and still we speak of preflighting. Time to change shoes.

Living on the Digital Edge

Have you ever sat at a dinner party and tried to explain what you do? For most people it's no big deal, they buy, they sell, they make or build stuff, they fix things or people, or they move money about. It used to be that printing was about making stuff so it was easy to just say "I'm in printing" or "I'm in publishing", if you wanted to be a little more enigmatic. But these days, explaining what you do isn't that simple, because in these digital days what this industry does is about computing and data, not just the mechanics of print.

And there is nothing in the least bit enigmatic or romantic about digital technology, apart from the fact that it is confusing and often obscure. Even for digital production professionals there are holes in our knowledge and awareness. To at least partly remedy this, this chapter presents some of the digital technologies we need to understand and keep in mind as we develop our digital workflows and work out how to manage preproduction data efficiently.

Service Orientated Architectures

Probably the most fundamental thing to appreciate is that digital production depends on collaboration, not just of individuals, but of services related to digital data processes. Service Orientated Architectures are the digital equivalents of buildings designed for specific purposes, but based on the same principles of materials and construction. SOAs provide IT flexibility and the basis of a specific digital environment. It comes down to taking advantage of digital technology to provide better services to customers. For print media production that means services that improve automation, quality control and throughput of digital files.

> Efficient IT management is the ultimate driver for efficient digital prepress, so looking at the stampede to digitisation, asset management, versioning and usage tracking are the next logical extensions to current workflow models.

For preproduction data management this means we have to embrace IT and accept that this technology shapes print media production environments. It is even more important because increasingly we operate in a mobile environment, using the Internet as both a

commercial and a production platform. Digital delivery of production files and remote soft proofing are just the start of it: preflighting and preproduction data management are about process automation and quality control in a distributed and increasingly mobile environment.

With increased production complexity and the need for faster turnaround and workflow automation comes the need to better appreciate the role of information technology in the information industry. Production workflows are shaped by low cost computing and data storage, superfast, high bandwidth networks and increasingly a mobile model for interacting with technology and media. Mobile technologies, such as wireless networks and digital handheld devices are changing expectations for how we interact with media and of course with production processes.

Process automation depends entirely on two fundamentals: solid database management technologies and standards. These two function within a client server architecture operating across a network. Amongst the most important data standards for graphics production are PDF plus its derivatives, and JDF and XMP. We are all well aware of the importance of the first two (if not see the Digital Dots Technology Guide to JDF), but why should we care about XMP?

The Exensible Metadata Platform was developed by Adobe to provide information about files and data. Metadata is data that describes a file's content or characteristics, so that the information can be used elsewhere by another digital system. XMP provides file details and information about a file's properties so that other applications can use the information. In some respects XMP is like a very basic job ticket, and XMP is indeed compatible with JDF. XMP is an open source technology that Adobe has included in all of its software. XMP captures meaningful descriptions and information such as the date and time a file was created, how it was created and where. Digital photos captured with a mobile phone and sent to a newspaper will thus be automatically identifiable, with tagging data that stays with the image throughout production and throughout the image's life. The implications of this for copyright ownership are tricky, to say the least. The point is that XMP is metadata for all types of digital files.

Just Don't Forget:

JDF: An interchange format for sharing job information, including customer intent and processing specifications across digital systems.

With an XMP-enabled application, information about a project can be captured during the content-creation process and embedded within the file and into a content management system. This is where XMP will most likely be used for professional publishing applications. Meaningful descriptions and titles, searchable keywords, and up to date author and copyright information can be captured in a format that is easily understood by ordinary people as well as by software applications, hardware devices, and even file formats such as JDF.

Both JDF and XMP are written in XML, the Extensible Mark-up Language. This language is derived from SGML, the Standard Generalised Mark-up Language originally developed to provide electronic mark up for compositionally complex documents,

such as dictionaries and scientific journals. XML is simple and extremely flexible. It was designed to handle very large and complex material, so it plays a vital role on the Web and elsewhere for exchanging all kinds of data. Anyone involved in printing and publications production should be aware of XML: the language was designed for publishing applications and its scope is so enormous that it can embrace every type of data format and so every type of information production requirement.

Time Spent in Document Production Related Breakdown:

Can't find file 12%

Searching for information 20%

Nondocument related time 60%

Other file related activities 8%

Source: Xerox

XML is a computer programming language suitable for very small as well as highly ambitious projects. Companies with the resources to support and develop their own print media production environments, such as newspapers and magazines, often hire people well versed in the use of XML to support their systems. Companies interested in JDF need look no further than to a capable XML programmer in order to plan and implement a workflow that uses JDF to manage jobs.

One of the particularly interesting developments in recent years is the use of XML databases, which are databases specifically for storing XML data. This isn't of immediate relevance for preproduction data management and preflighting, but as variable data production applications develop, it is likely that the role of content databases will also develop in tandem. Preproduction data management of variable data content will depend on interactions between job management and multiple content databases, many of which will rely on XML for document management and for interfacing to other databases. The hows and wherefores of this have barely been glimpsed, but that's a story for another day.

In the meantime, effective preproduction data management and preflight checking procedures depend on two key things. The first is an awareness of the nature of digital data, how it behaves and its vulnerabilities, and the second is to understand the constraints of print data processing, including all aspects of colour management and digital imaging. These are the dual imperatives that drive the digital reality of modern prepress.

What's Inside a RIP, and Why Should We Care?

Most designers are happily unaware that the documents they produce on their computers, and see developing on screen as they work, need to be properly processed before they can be output on paper. What you see on the screen might not always be what you will get on the colour printer, the hard copy proofer, or on press. Why this is, and what both joins and separates the two main technologies used to create output pages – Postscript and PDF – is what this chapter is about.

The technology that processes page content so that black or coloured dots can be output onto paper or plates is a raster image processor, a RIP. There are basically two main types of RIP: embedded RIPs which are built in into a printer, and dedicated RIPs which are often referred to as software RIPs. Although adjustments and changes to processing parameters are possible in embedded RIPs, it's the server based software RIPs that offer the greatest scope for extension and customisation with additional functionality for processing both Postscript and PDF files in a more sophisticated way.

Working with Postscript and PDF

When working with design in layout or illustration software, the software generally doesn't work directly with Postscript or PDF commands. Be it Adobe Indesign or Quark Xpress, the software assumes output to Postscript or PDF, but it works with its own internal graphics engine. The software saves the document files in its own native file format, not Postscript or PDF. Ideally the graphics engine in the layout software will warn the user if the design they are about to finish will be impossible to render properly when printed on paper. This is possible to some extent, but with the introduction of cross media publishing, where the documents might be published on screen via the Internet, or through multimedia CDs, it's not always clear (for the software) what the publication intent really is. It's important that designers keep in mind what the final output will be for the files they are preparing. Process awareness is key to good preproduction data management, because the monitor can be deceptive. The monitor can show virtually anything that it is possible

In slightly simple terms the three basic processes inside a RIP are interpretation, rendering and finally rasterising.

to create with the software, from colourful RGB images to smooth colour blends with numerous transparency layers. But although it looks gorgeous on screen, the screen image may or may not be rendered correctly when printed on paper. This is where the RIP comes into the picture.

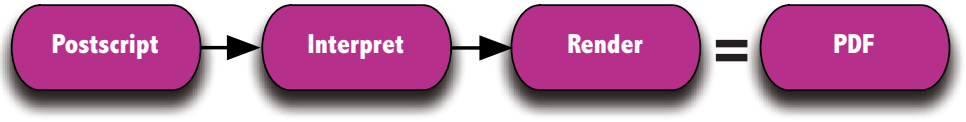
The design, as it is presented on the monitor as a series of raster dots, needs to be translated into a language the printer understands before it can be imaged at a higher resolution, that is, as a different series of dots. The RIP is the software engine that calculates how rasters on the screen should be imaged on an output device taking into account differences such resolution, and output requirements such as trapping and screening. For many years now, Postscript has been the preferred page description language for the graphic arts industry. Given the endemic uptake of PDF (Portable Document Format) as the basis for graphic arts workflows, one may well wonder why we can't simply save a file as a PDF and have it correctly processed in the RIP. Well we can and we can't.

In all of today's RIPs, one way or another, pages have to go through a final rasterisation and screening stage, a stage that still requires the Postscript language to execute. And even the latest version of Postscript, version 3, doesn't support everything that can be saved in the latest PDF version, version 1.6. The gap between what we can create in layout and illustration software, and save or export to PDF, and what can be understood by a Postscript 3 RIP, has widened continuously over the last few years. Let's keep that in mind, and look into what actually happens in a RIP.

There are three main things that a Postscript based RIP has to do. The first stage is interpretation of the core Postscript code, in other words the interpretation of the programming language instructions. Depending on output requirements

A Word On Postscript

Adobe Postscript is a computer programming language designed specifically for page description. Anyone can learn to write their own Postscript language based interpreter. Probably the most commonly used interpreter in high end RIP systems is the Adobe CPSI RIP (Configurable Postscript Interpreter) which can either be the basis of a more sophisticated software based RIP system, or built into a hardware RIP sitting inside an output device. Besides the Adobe Postscript interpreter, there are a few well known alternatives to choose from, for example the Global Graphics Jaws and Harlequin interpreters, as well as Artifex (also known as the Ghost Script interpreter).



Postscript to PDF Data Interpretation: A PDF file has gone through the first two RIP processing steps, interpreting and rendering Postscript. The result is then saved as a composite unscreened PDF file.

A Word On PDF

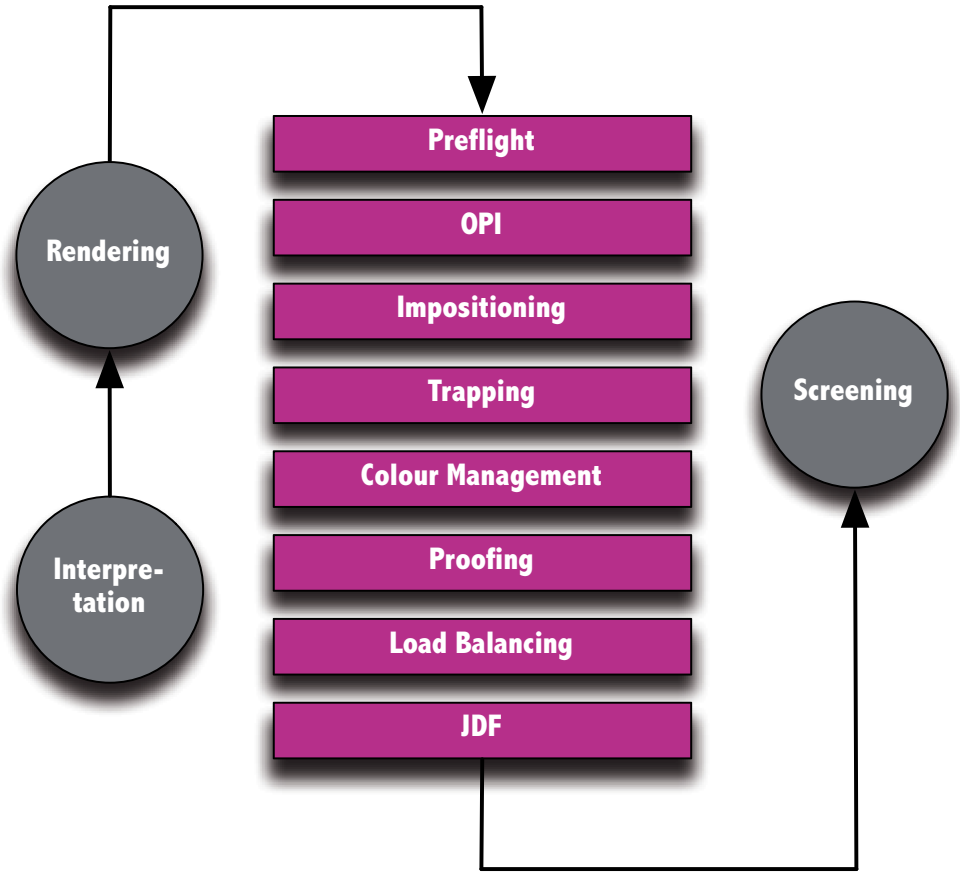
Like Postscript, the Portable Document Format created by Adobe is an open technology, but it is a format rather than a programming language. The PDF specification can be downloaded from the Adobe web site, so software vendors can write their own PDF compatible software to create, edit or in other ways process PDF files. While for the most part this is a very welcome thing, it also means that PDF today suffers from the same inconsistency as Postscript. If we must constantly keep in mind where the PDF files we work with have come from, how they were created and what publishing intent was the basis of their creation. Also, PDF as a format has the scope to support many more features and functions than Postscript, which is one of the main reasons why not all PDF files are suitable for a print workflow. Even PDF files created using Adobe's own software can be problematic for print output, so we need to impose restrictions on PDF files, according to the print process we intend to use.

(resolution, scaling, colour modes etc), these instructions render or rasterise the page content into individual picture elements, or pixels. Before transfer of those pixels to a film, plate or paper, the RIP has to execute a third stage: screening and separation to create individually screened colour separations based on the cyan, magenta, yellow and black components of the page image. Only after screening can the one bit data be imaged on the output device. The processes are basically the same for server based RIPs and for embedded RIPs, but the sophistication of the data handling is much reduced for embedded controllers, which have much more limited functionality.

In a server based RIP the three basic processes can be split up into several subprocesses. For example, a separate print queue could be set up for proofing and include the required colour management to ensure a close match between the colour printer output and that of the final print. Another task is impositioning, which a server based RIP can support, or print specific trapping, and so on. All of these tasks require checking for output accuracy, which has fuelled the development of preflighting tools, and their gradual integration into the workflow and into RIP technologies.

Specific task management has become integral to multi-functional Postscript RIP systems. A modern RIP system is therefore modular in design and typically processes both Postscript and PDF files. The user can start with a simple system, and purchase additional functionality when needed. Preflighting can of course be incorporated, coexisting with different modules and working according to the requirements of the workflow.

Because Postscript language instructions need to be interpreted, there can be variation in the details of its interpretation. This is one of the main reasons why preflight checking software is so important. It is a means of minimising the variability of Postscript language processing, which was incidentally one of the reasons Adobe developed PDF. PDF makes it possible to save the interpreted and rendered page using a dedicated and mostly unambiguous data format. Although it was not designed specifically for graphic arts production, the printing and publishing industries have wholeheartedly embraced PDF. Its adoption as the basis for prepress



In a modular RIP system, the border between interpretation and rendering is quite blurred. It's possible to extend a RIP with a range of additional features and functions that take place after interpretation and affect how the rendering will be done.

production has substantially reduced erratic and inconsistent Postscript interpretation. It has also simplified document interchange, which is what it was originally designed for.

With PDF, document creators have a third choice for file delivery, besides native documents and Postscript files. PDF offers many possible advantages, such as file compression and font embedding, but it is still important to remember that several print related parameters must be defined when creating a PDF file. Not only does this give the designer a measure of control and responsibility for their print process, it also imposes preflighting discipline.

Workflow Systems

Modern RIP systems have been extended to act as workflow management systems and include even more sophisticated functions. This includes handling electronic job bags written in JDF (Job Definition Format),

managing colour, trapping and impositioning, just to mention a few common features.

Although a RIP system often handles a range of historic file formats, a RIP's architecture generally assumes that it will be processing standard data formats, such as Postscript and PDF. RIPs do not assume they will be processing native documents such as Adobe Indesign, Quark Xpress, Microsoft Word or Power Point, or Corel Draw and so on. Most high-end workflow and RIP systems are built around Adobe's Postscript Extreme architecture, which assumes PDF as the base processing format, and are designed to optimise PDF processing as far as they can. Therefore at the RIP system all documents are automatically converted to PDF. Even if the incoming files are already saved as PDFs, they need to be validated and checked for such things as resolution and print specific parameters. A modern RIP and workflow system supports multiple processors and can also split up a multi-page Postscript file into single page PDF files. This can speed up production, but it makes the need for preproduction data management and preflight checking even more vital.

Rob White at Hexprint in the UK, on automated workflows:

"We were formally outsourcing all our prepress work to a repro house. The installation of the Platerite 8000II and Trueflow has given us more control over both costs and turnaround."

Once pages are checked and validated, in RIP impositioning, colour management and trapping take place. Rendered, but as yet unscreened, single page device independent PDFs are output according to the workflow requirements, for example to a proofer or remote user's computer screen. The proof requires its own colour data management if it is to match the final print, and this is managed in the RIP and workflow system. If the proofing device cannot manage the full size of the spread, the imposition will need to be temporarily changed, which a RIP system should be able to do automatically. Quite often single pages may need to be corrected or replaced and this too should be handled without having to re-RIP or re-render the whole spread.

While many RIP Systems are said to handle PDF, there is an uncertainty today as to how best to handle files created with the latest version of PDF, version 1.6. The PDF version that is closest to Postscript 3 is PDF version 1.3, which is the basis of data standards used for graphic arts production such as PDF/X. More on PDF/X in the next chapter.

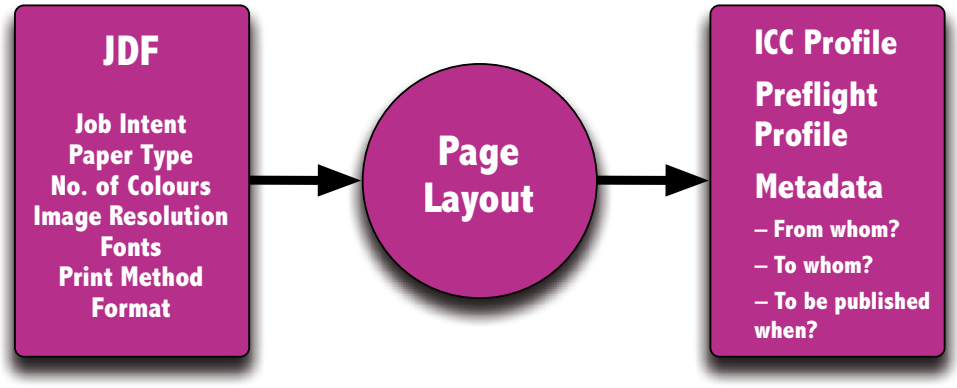
Adobe recently announced a completely new RIP architecture, one that can process native PDF files up to version 1.6. RIP system developers are introducing new RIP and workflow strategies based on the technology outlined in Chapter 5. Until these technologies are reality, we must struggle with how best to process PDF files created with versions higher than 1.3. Many designers downgrade, or "flatten" their PDF files to version 1.3 before sending them to the printer. This may be the safest way of processing pages at the moment, but it is not at all satisfactory, since it prevents designers from taking full advantage of features in Adobe Indesign and Quark Xpress. A far better option is to have a common standard for printable PDF 1.6 files. This is what Adobe has introduced.

Preflight or Postflight Checking?

Non-printable files are a common problem in the publishing workflow. There are many ways to try and ensure that documents really can be output and that is by checking them very carefully beforehand. This is the process commonly called preflight checking. But how and when should it take place, and with what tools? This is perhaps less clear and there are various options and strategies that can ensure both file integrity and the printability of documents prepared for high end graphic arts production.

Chuck Weger, an American technical editor and consultant within the graphics arts industry, is said to have been the first person to use the term "preflight" in relation to graphic arts production. However Esko-Graphics was the first company providing tools for checking production readiness. The company didn't call it preflight back then, but in essence Esko-Graphics' tools, such as Print Rule Checker, were preflighting technologies. Markzware was the first company to file a US patent for a "method for examining, verifying, correcting and approving electronically recorded documents, prior to their final output, whether printing, transmission or recording".

Several companies recognised the problem, even if they didn't have a snappy way of describing it. The term "preflight checking" originated in the aviation industry and refers to the checks a pilot completes before heading off for the runway. For a document creator or designer, preflight checking corresponds to the document checks made before sending a file off for output and/or final printing. While this is all well and good, and it's done more and more in automated workflows, we need to



Ideal job preparation: Ideally all vital job parameters and job intents should be clearly stated and defined before design and layout starts. In this way the designer or document originator knows at an early stage for example what ICC colour management and preflight profiles will be used in the production path.

introduce critical parameters and production intents even earlier than in the design process. Ideally preflighting profiles and job intents should be established even before the layout and paste up starts. If the document checking doesn't take place until the files actually reach the prepress department, we have a situation of "postflight" checking rather than preflight. Errors not found until this late in production, may cause unnecessary delays to the publishing project.

Order! Order! Order!

Before starting a publishing project it's a good idea to think through the production chain, all the way from concept to distribution. What software will be used? What procedures will be followed? Where will content data come from?

Nigel Clark, Lynx dpm's technical director:

"I have devoted a lot of my time in prepress finding ways to link disparate systems to reduce manual intervention and improve information flow".

Who will create it? How will it be printed? Will it be printed in multiple locations? Any point where the slightest uncertainty or doubt creeps in, is the point at which to cross check requirements, ideally with someone with sound experience of a similar production workflow. Many of the problems occurring in prepress can be avoided by establishing working practices that suit the project early in design and production planning.

Preflight checking is about quality control and different technologies are available to suit different types of production environments. Many common mistakes can easily be avoided well before a file gets into the production chain. Much of what is considered an early preflight, is in fact about good working practices and using the tools best suited to a production process.

While preflight checking is mainly associated with using dedicated software to check files, using checklists and defining standardised "best practices" can take you quite far towards trouble free production workflows. In Quark Xpress 7 for example, many of those "best practices" can be defined in Job Jackets, which are based on JDF. A Job Jacket is an electronic order form, which can call for specific set-up parameters. But while this can be of great help, the designer still needs to think through the production chain, and to know about and understand the more vital production parameters.

Frequent Errors to Avoid

Missing images or fonts is by far the most common error in documents that are supposedly ready for print. For example, most layout software links images used in the file to the high resolution versions residing elsewhere on the system. On the page it looks as if the correct image is there, but in fact it is only a low resolution proxy version. The final image, the one that should end up in print, must of course be the high resolution version. This is the sort of error that preflight checking tools will pick up.

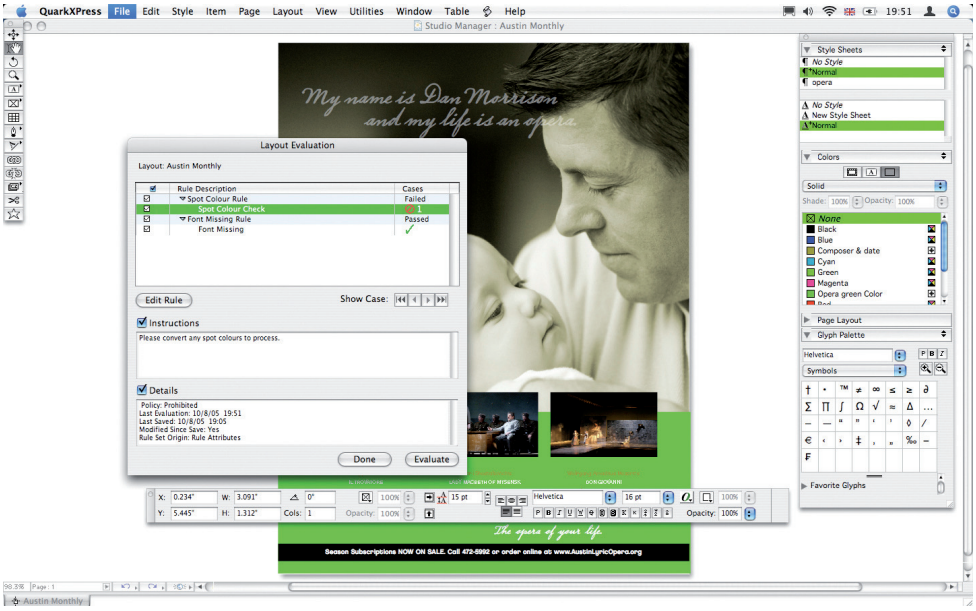
For those designers working exclusively in a Macintosh environment, the idea of file extensions is almost unheard of. File extensions help a computer's operating system to handle files efficiently, providing it with information about the software used to

create the file, so that it knows how to open and process it. Commonly used extensions are .doc, .tif, .jpg, .eps and so on. They are a useful means of managing files, because they can simplify file processing, particularly in hybrid environments with for example Macs, Windows PCs or Unix servers.

Although it's possible to work with RGB images during page layout, colour conversions must be made at some stage. Generally it is the printer who handles this, so it is important to know which ICC profile will be used early in the production workflow. Designers

probably won't be absolutely accurate. If the printing really will be done with CMYK plus additional spot colours, it's important to specify this in the job intent, or the spot colours will most likely be converted for CMYK output only, automatically.

Missing images are bad enough, but at least they are pretty easy to spot. But images with insufficient resolution generally take rather more effort to identify. The image resolution required for print output is generally calculated to be twice the resolution of the screen frequency that will be used on press.



Defining Job Intents: In Quark XPress 7 many of the job parameters can be defined using Job Jackets. Throughout the design process, the document can be checked for compliancy to the parameters set up in those Job Jackets.

like to suggest certain colours in a layout by choosing among the special colours in the colour palette, from companies such as Pantone. Ideally the document then should be printed with those additional spot colours to ensure full colour accuracy. But what is more common, and cheaper, is to convert those spot colours to CMYK only, but then the colour

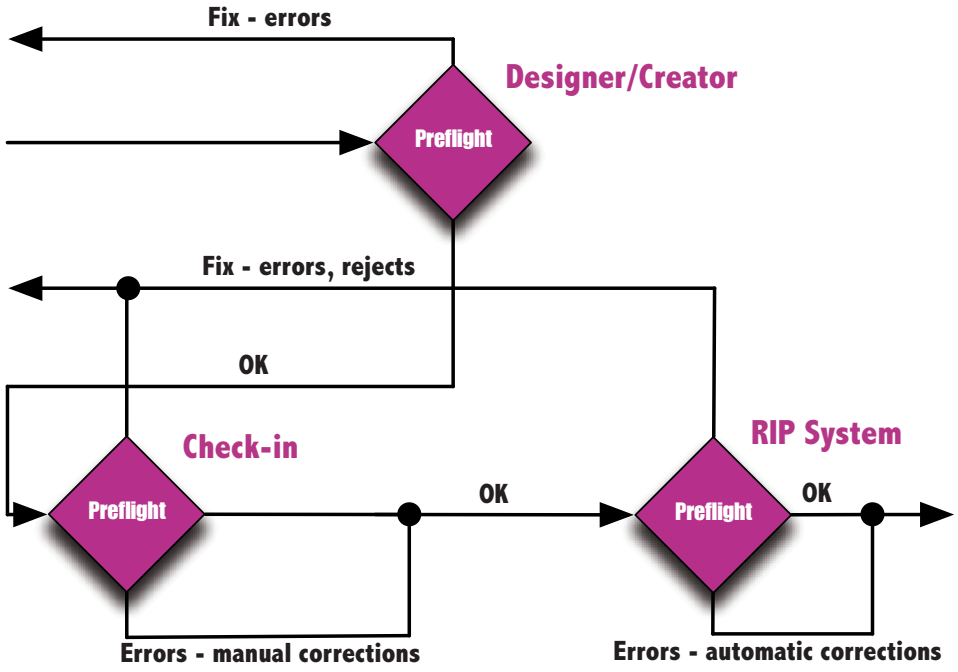
Using for example a screen frequency of 150 lpi (lines per inch) means that images require resolution of 300 ppi (pixels per inch). Make sure the image resolution is high enough for the type of production at hand, including any scaling that might have been applied to the image.

Truetype fonts are known to sometimes cause problems in a Postscript based workflow, so check early that fonts pass through the printer's RIP without any problems. Some preflight profiles don't accept Truetype fonts, so an early preflight check will reveal this.

Bleed is the term used to describe a printed image that reaches all the way to the outer edges of a page. Making a mess of the bleed is a very common error and one that preflight checking will identify. Images printed with full bleed require an extra three to four millimetres added to their dimensions, so that when pages are trimmed in the finishing process there will be no white gap. Using the correct bleed settings prevents the appearance of this gap around the image in the printed document.

Working with Preflight Checking Software

Proper and complete preflight checking of native files, as well as Postscript and PDF files, requires dedicated preflighting software. The software might operate as a plug-in or extension to other software. Most preflight software not only identifies production errors in the document: these tools also explain why something is considered an error and how to correct it. There is plenty of room for improvement in this area, as sometimes error explanations are unfortunately quite brief.



Three Stages of Page Processing: Ideally all documents should already be checked by the designer or originator, before they are sent off to the prepress department or printer. No manual file editing should be required in the RIP System.

Preflight checking for production readiness should ideally take place throughout the production process, at each transition point as the file moves through the workflow. Some basic preflight checks can be performed in Indesign and Quark Xpress as part of the file preparation stage. Another logical point is immediately after a Postscript or PDF file is generated or, even better during PDF creation. Preflight checking is an absolute must for files entering the final stages of production. Internet based, on-line preflight checking and production management is becoming increasingly popular and is incorporated into several online collaborative production management and softproofing systems. The final point of preflight checking is prior to output, even though modern RIP systems incorporate preflight functions as a final insurance. Waiting to check files at the RIP is too late, and can be expensive when it comes to identifying and correcting specific errors.

The X-files

PDF workflows were expected to simplify production processing a great deal, but unfortunately PDF hasn't entirely fulfilled its production promise. Adobe wrote the PDF data format for use in a wide array of applications, not only paper based print production. So a PDF file can contain audio- and video-clips, annotations, animations and much more. Such busy PDF files are unlikely to be welcome to print production workflows, so a graphic arts industry initiative was set up to define a strict definition of what constitutes printable PDF.

The work started in 1998 to define how printable PDFs should be constructed with DDAP (Digital Distribution of Advertising for Publications) driving the work. In 1999 the first version, called PDF/X-1 was presented, the "X" standing for exchange. The DDAP user group of high volume ad buyers soon transferred to CGATS (Committee for Graphic Arts Technology Standards) the more technical work on the specification for PDF/X. CGATS is responsible for the ISO standardisation of PDF/X.

In 2001 PDF/X became an ISO standard for printable PDFs. It is a subset of the Adobe PDF standard and it excludes all parts of the PDF format that are not relevant for print applications. There are now three versions of PDF/X, and a rather confusingly it's only PDF/X-1a (the revised version of the original version PDF/X-1) and PDF/X-3 that are in practical use. PDF/X-2 was ISO certified later, but it is a less used standard.

PDF/X-1a is the strictest conformance specification since it requires CMYK images and spot colours, and the inclusion of a specific ICC profile, unless the output condition for which the file was prepared is included in the ICC registry (all Fogra/ECI characterisations, SWOP, Japan Color and the Ifra newsprint characterisation are in that registry). For the latest revision, it has been suggested that the "a" be dropped, in the interests of simplicity.

Besides CMYK images and spot colours, PDF/X-3 allows RGB and CIEL*a*b* encoded images, as long as they are coupled with the appropriate ICC profiles. While PDF/X has made it easier to specify how a PDF file should be constructed for print output, the standard still doesn't specify such things as the minimum resolution required. To make up for this, the term PDF/X Plus is used to indicate that the file's user or receiver has to provide some additional information about the printing conditions. This is normally achieved using specific preflight checking profiles, where for example the required minimum resolution can be specified. The latest revision of the X-series (of 2003) is based on PDF 1.4.

In addition to DDAP, the Ghent PDF Workgroup, the GWG, was set up in 2002 as a user group. Today the GWG works very closely with CGATS to further refine the PDF/X standard and suggest actual settings in the most commonly used applications. In reality the GWG suggests the different flavours of PDF/X files, the Plus part. This comes into play when you are to create a PDF file for a certain type of print production. Whatever preflight or PDF creation software you use – make sure you use the PDF/X setting recommended by the publisher and/or printer.

Work is underway on PDF/X-4, which will be based and accept the latest PDF technology, version 1.6. We expect to hear more about this new version in late 2006, but the final version of PDF/X-4 probably won't be available until early 2007.

Much as we had hoped that PDF would end the struggle in electronic document delivery, there is still some way to go. Like it or not, one still has to preflight files before sending them off. To create documents as PDF/X files is fast becoming the most popular and secure way of doing this.

Quality Assurance & Efficient File Delivery

Dedicated server based preflight checking technologies automate file receiving and checking. They reject or process files according to their conformance to production requirements, passing compliant files to the next stage in the workflow. There are several companies developing powerful server based management systems. Markzware's Flightcheck Online is a web based preflight and quality assurance service and Enfocus' CertifiedPDF.net is a subscription based service for managing PDF quality specifications between design and production. Quickcut is gaining increased recognition for its server based checking, approvals and processing technologies.

A central part of these systems is how they manage metadata, information about the data in the file and the file itself. Metadata ought to provide sufficient additional information about the document's source, target destination and publication details. It is the sophistication of this data handling that distinguishes the several systems available for this type of data management. The AdsML standard is being developed to meet this need of metadata for use in advertising workflows.

There are many ways to automate file delivery, however data security is an important concern – even e-mail attachments can be intercepted by hackers. FTP is one option but is a public FTP folder safe enough for high value file transfers? Probably not, if you handle sensitive documents with content that shouldn't fall into the wrong hands. For maximum security, files should be encrypted, but even in less critical situations it's important to set up a reasonably good file transfer system, with transparent document tracking and automated confirmations for successful file delivery.

One of the most widely used technologies for data control and quality assurance, particularly for PDF files, is Enfocus Certified PDF. This technology is used in a range of prepress production workflow systems. Certified PDF keeps track of everything that has happened to a PDF file, including who did what, when and where, but it's also handy for version management. Thus it is possible to track any changes made and if at a later stage necessary, manually update the files.

One of the easiest ways to check if a PDF file conforms to one of the PDF/X standards is to include this test chart on the page.

In parallel with the work to make PDF/X an international standard, an important UK based standards initiative is working to further refine PDF production standards. The Periodical Publishers Association standard is called "pass4press" and the group's work is being extended to also provide guidelines for verifying proofing systems. "proof4press" and "pic4press", which specifies production criteria for digital images, are important quality initiatives and recently the PPA has joined the GWG to synchronise the work it is doing, particularly for the pass4press standard, with that of PDF/X and other GWG standards.

The Future for Postscript and PDF

Early preflighting technologies were introduced to solve problems in Postscript language processing, but preproduction data management is no longer just about sorting out bad Postscript. Postscript is still the heart and soul of graphic arts production and over the years, it's had a long and fertile life; it's effect on the information industry remains unmatched. Postscript isn't over yet, but times are changing. The reins are passing from the hands of Postscript to those of PDF, changing the nature of print production workflows and of course reshaping the dynamics of preproduction data management and preflighting.

Postscript and its clones changed the face of printing and publishing. When we think of the original Adobe Postscript page description language, we tend to think desktop publishing and the greedy decade that was the eighties. But Postscript's origins go back to 1976, when what was to become Postscript started life as the result of a research project. Postscript has been synonymous with Adobe's success for many years, but when PDF came along it seemed that Adobe started to lose interest in it. That wasn't so and the language continued to evolve in line with modern production developments.

In 2005 Postscript got a major facelift with the introduction of Postscript 3, version 3017. This was the first version of Postscript CPSI to be available either as a Host Edition for high end applications, or as an Embedded Edition for generic office applications. Adobe's strategy appeared to be not dissimilar to that of Global Graphics, developers of the market's dominant Postscript language clones. For several years Global Graphics has offered the Harlequin and Jaws Postscript language technologies for graphic arts and office applications. With the introduction of two versions in 3017 Adobe seemed to be following the same strategy. 3017 has improved colour and PDF processing, particularly for users of Adobe Creative Suite 2 (CS2), including Photoshop and Indesign, but especially for CS2's PDF enhancements.

This introduction was much more than a repositioning of the language for different markets however. It marked the point of transition away from Postscript language based raster image processing, towards the processing of native PDF in the RIP. With native PDF processing in the RIP, no longer would output device constraints drive workflow and no longer would files be locked early in the workflow, preventing last minute corrections or edits. PDF, a closed vehicle for content, has been the basis of graphic arts production workflows for years but although PDF has long been the foundation of workflow management, Postscript has until lately been the processing language used to drive the imaging engine.

PDF Print Engine

PDF was not designed to replace Postscript, but as a universal rendering engine, something that could render an electronic page file anywhere, irrespective of applications and operating systems. Postscript was designed to integrate text and graphics into a common

data stream for device independent output, and PDF was about electronic document interchange. It has taken many years, but finally these two share a common purpose. Adobe has introduced a native PDF RIP and for preproduction data management its ramifications are far reaching indeed.

When John Warnock (pictured) together with Charles "Chuck" Geschke presented PostScript in the early eighties, it wasn't at all certain that this page description language would have any profound effect within high end graphic arts production. As of today Adobe dominates page processing to an extent that must astound even John and Chuck.

Native PDF processing provides a single platform for PDF inputs and outputs. Adobe PDF Print Engine is designed for Adobe's high end market, where documents are graphically complex and workflows convoluted. The technology provides a unified production platform and removes a significant processing variable: Postscript language processing at the RIP. This means that such things as transparency in a file will be rendered directly, without having to be flattened first, for greater accuracy and device independence.

The PDF Print Engine is a native PDF RIP, although Adobe prefer not to use the term. It is a common rendering engine for driving RIPs and soft proofing technologies, and in practical terms this doesn't appear to differ from processing PDFs created with a common profile. But there is no additional Postscript processing, so the output is one hundred percent accurate. Instead of Postscript language commands, PDF library instructions render the data to the output device, be that print engine or screen, or another RIP. There is no conversion to Postscript, so there are no rounding or floating point calculation errors in data calculations. Calculations are therefore not limited to integer (whole number) calculations, which is what Postscript understands. This means that mathematically complex output, such as colour data converted from RGB to CMYK will be more accurate when rendered in native PDF as a bit map. Colour conversions with ICC profiles are supported internally, and JDF in-RIP trapping and in-RIP imposition are supported, along with a range of JDF ICSs (Interoperability Conformance Specifications). There is also support for PDF/X-4, which is due to be ratified by early 2007 and supports transparency and layers.

This technology is more suited to distributed processing which is the reality for more digital production. Because of this, it will be especially important for variable data production, processing multiple source data at the rated speed of a high speed variable data output device. According to Adobe, its market focus dictates that the first version of this technology will be Windows only, with Unix and Mac OS supported in the next version due out in 2007.

Does all this mean Postscript is going away? According to an Adobe spokesman, the company will maintain Postscript "for as long as the market requires". Adoption of native PDF processing has already started within

the developer community, with Agfa, Fuji, Heidelberg and Screen planning new workflow systems. The migration of all leading workflow solutions to PDF Print Engine is expected to be complete by Drupa 2008.

Why PDF?

✔ *File and device independent*
✔ *Plaform and OS agnostic*
✔ *Massive development support*
✔ *Migration to nongraphic arts workflows*
✔ *Cheap*
✔ *Open*
✔ *Easy to use*

Why Not PDF?

✘ *Font problems persisting*
✘ *Hard for users to create accurate output files*
✘ *Hard to edit*
✘ *Inconsistent colour output*
✘ *Resolution variables*
✘ *Trapping tricky*

Once adoption at the high end is underway, Adobe intends to migrate this technology downmarket. This is where life for preproduction data managers will start to get rather more interesting. Inevitably the technology will come up against Microsoft's new printing platform, XPS (XML Paper Specification).

Although XPS is no match for PDF at the moment, the specification for it was written by Global Graphics, one of the most successful vendors of Postscript clone RIPs. More importantly, Global Graphics is an industry veteran, responsible for some of the leading developments in Postscript and PDF processing over the years. The Jaws Postscript and PDF interpreter technologies, as well as the Harlequin RIP system have been used in many desktop printers, proofers, digital printing systems, platesetters and filmsetters around the world.

For Microsoft, XPS is fundamental to its new version of Windows, due out at the end of 2006. XPS will provide the means for both document exchange and print path control, providing the same utilities as Adobe PDF and Postscript. Windows has some woeful inadequacies such as no support for spot colours, poor handling of smooth shades, no support for transparency, and pathetic support for CMYK output. XPS is designed to resolve these output handicaps in Windows, which is why Adobe is currently concentrating its efforts on the Windows version of PDF Print Engine.

A particularly interesting aspect of XPS is the fact that it is based on XML, and this opens up for it all sorts of interesting opportunities. XPS also works tightly with Windows' new imaging model, Win FX, so there is no conversion needed when sending documents for output. The page description language is the print path format, which is also the document exchange format. Clever.

Although XPS's preliminary specification lacks many of the advanced features of PDF, it is based on XML so it has latent capacity for efficient print-on-demand and variable data output management. XPS supports dynamic calls of objects on the page, which is precisely what dynamic print streams require. Postscript and PDF have never been strong on variable

data printing, which is one of the reasons why the new PDF Print Engine is designed to support distributed processing.

XPS isn't yet a worry for high end graphic arts production, but it will eventually be encountered in print production workflows. Designed for users of Microsoft Office, XPS files will unavoidably end up in digital media workflows, simply because it's there and notwithstanding the fact that it makes proof and interim printing faster and easier, and provides better image quality.

For printers and publishers life will of course get more complicated, particularly for those who still struggle to correctly handle PDF, or who are still reluctant to bother learning what PDF/X is and how to create PDF/X files. For Windows users the XPS document file format will be the first choice, so of course such files will meander their way into copy shops, printers and publishers. What mayhem they will cause amongst printers and production houses who are not up to speed with format management is anybody's guess. This perhaps more than anything else is why people buying and creating print media documents need to keep current with preproduction data management and preflighting.

In 1985 John Warnock said of Postscript: "I can say without hesitation that the quality of the language, both in its design and in its implementation, has improved and matured greatly during the several stages of its evolution." And he's still just as right, twenty years on!

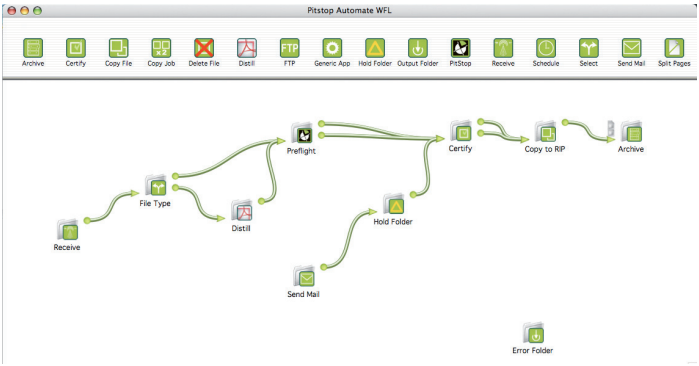
File Delivery & Networked Quality Control Management

We are at a slightly uncomfortable place in the evolution of the graphic arts industry, because we are bound by the physicality of print, but we create that print using digital abstractions. And such is the complexity of print media production that digital supply chains are no longer simple or easy to control. Keeping up with IT is almost as crucial to our jobs as keeping up with dedicated graphic arts production technology.

One of the areas causing great anxiety for producers and buyers of print is how to exploit remote production models efficiently. They want to use digital file delivery and process automation for output quality control. The Internet provides the foundation for basic file delivery, using foundation standards such as TCP/IP and HTML. Soft proofing and approval processes are migrating to the Internet, and in conjunction with this standard file delivery environment, we work with a range of graphic arts specific data standards for sophisticated file processing. These standards may not have been designed for distributed, network based applications, but all of them function perfectly well in a networked environment. In fact the remote dimension is irrelevant for data formats: they don't at all care where they live or how they got there. But they are absolutely vital for quality control.

Standard Practice

For the printing and publishing industries, the most important data standard of all is JDF, the Job Definition Format, based on XML. This job ticketing format specification manages file metadata production tasks and process automation. There is also a bevy of PDF standards which are important for quality control. The Ghent PDF Workgroup has written a specification for PDF creation and quality control that outlines standard software settings for a range of applications, to ensure accurate PDF creation. The Ghent PDF Workgroup's efforts are primarily concerned with PDF quality assurance and control, so these specifications are especially relevant for automated distributed processing and ensuring accurate file delivery. The final standard to



Sample workflow screen from Enfocus' next generation workflow automation technology, Pitstop Automate.

consider for digital file delivery is AdsML a consortium driven initiative also based on XML. This group is developing a standard specification for how digital advertisement files should be exchanged between media organisations throughout a file's life cycle. Using standard data formats within a well specified and robust IT infrastructure, an effective file delivery and communications system can substantially improve print media workflows. The digital system can make sure that files get safely to and from one or many destinations. It can automatically manage incoming and outgoing files and check that they meet required quality criteria. This type of system is not just about data transmission, it's about managing quality assurance and control processes. Ultimately it's about new business development.

Who Does What?

Most technology development companies recognised some years ago the importance of the remote model and its implications for the development of automated prepress production, quality control and file delivery. Several of them saw very early on the potential of the Internet as a delivery environment and started working towards network server based technologies. These development companies pretty much followed their own paths, pursuing very different business models and markets, and serving different customer needs. This has fortunately encouraged a broad range of application developments, and has made for an extremely fertile development community. The range of production, printing and publishing business applications these remote technologies can support is limitless, as the following examples of technology development perspectives suggests.

Enfocus is best known for its Pitstop product line and there are now around 75,000 users of this technology worldwide. Enfocus technology is also at the heart of virtually all high end graphic arts production workflow systems. The latest addition to the line is Pitstop Automate, a new server based PDF processing tool built entirely on JDF for automation and advanced file routing. Pitstop Automate includes Certified PDF for handling embedded PDF profiles and server based quality control and file management. To further encourage the development of remote production models, Enfocus set up Certified PDF.net, a dedicated site for remote preflight checking and file management that now has 7,000 members.

For a number of years Markzware has also been developing technology to support remote production models, with desktop and server based versions of its Flightcheck quality control and preflighting technology. Job2Print is a dedicated service for remote distribution and collection of jobs within production groups, and between service providers and publishers. Markzware has also developed a number of file conversion and repair utilities and a version of Flightcheck for automating workflow processes and file routing. Much of this company's technology gets used by printers and repro houses who re-brand it to create a dedicated service for their customers. There are numerous customers using Markzware technology, either under the Markzware name or re-badged. Amongst these are Adfast's Adflight and the Telegraph Group's Telegraph Preflight for advertising delivery to newspapers, as well as JJays' Checknsend for quality control and delivery of magazine ads.

Quickcut has perhaps the most complex and sophisticated business model, which is why it could take the prize for being the most misunderstood company in the business. Quickcut develops technology for quality

Using standard data formats within a well specified and robust IT infrastructure, an effective file delivery and communications system can substantially improve print media workflows. The digital system can make sure that files get safely to and from one or many destinations.

control and distributed file management. Quickcut file delivery technology is the most widely used in the world, accounting for the delivery of millions of advertising files daily. Although Quickcut's business was originally based on digital advertising file delivery, the company's technology has now evolved considerably to optimise file management from origination at the desktop to delivery at the publisher, and right through to the final printed output.

Like its competitors, Vio is in the business of digital supply chain management. However Vio combines its own technology, plus that of third party developers, most notably Markzware and Enfocus, for preflighting, and ICS for colour managed softproofing. Vio is unique however in that it also offers network management, and the company has extensive experience in network management. The company's technology is, like that of Quickcut, most often used in newspapers and magazines for advertising applications. Vio's applications also include ad creation tools and colour managed softproofing for agencies, as well as automated booking and insertion management for publishers.

This is just a small selection of the many, many companies developing file delivery technologies to facilitate remote production. This industry is even coming to the attention of dedicated networking technology suppliers. Carrier Grade Ethernet Service Providers specialise in connectivity services to help companies manage their network traffic. The existence of such a service provider is wonderful news for printers and publishers, but there is only one such company we have come across focusing on printing and publishing.

Exponential-e provides services for WANs, Internet based Virtual Private Networks (VPNs), peering and Ethernet solutions, plus technologies which support Ethernet and Internet based activities. These can range from basic data storage and archiving, through to private network management with the tools to make networks easy to work with and upgrade. Exponential-e manages the infrastructure within which dedicated graphic arts production technologies function.

Technologies are invariably shaped by a development company's origins and perspective of the market it serves, so it is important to keep in mind some considerations vital for graphic arts production. Colour management is one, and if you are doing a lot of high quality colour production, it will likely be the most crucial worry. Colour must always be viewed in a controlled environment, so for remote

applications it is vital that all participants in the supply chain work to the same control parameters and understand how to work with calibration and profiling technologies, for both monitors and hard copy proofers.

Security is fundamental to any server-based application, however for graphic arts and publishing applications there is the additional requirement for version control and file management. Approvals need to be managed as well as the files, especially in time critical environments. All of this can, with the right technology, be automated as part of the workflow management, and automation of course brings with it additional risks.

Automation is ultimately what all of this is about. Automation can be a godsend or a hell on earth, depending on how well it does or doesn't work. The caliber of digital file deliver and quality assurance technologies will determine whether your production environment is indeed a digital heaven or a binary hell. Fortunately, as we move away from hard copy based production to digital production, all major graphic arts workflow system developers are building systems with digital heaven in mind. This means an ever-greater dependence on digital technology and exploiting the Internet as an environment for media production as well as for commerce.

Ten Things to Consider

- How do we manage colour across sites?
- How are file versions controlled?
- Can we automate processes?
- What is the approvals process?
- What determines the master version?
- How is system and file access controlled?
- Where and how are production tasks managed?
- Am I buying a system or a service and what is the cost model?
- Which industry standards are supported?
- How is standards support maintained?

Control Freaks

There are many technology developers working on graphics production quality assurance tools. The controls in products on the market range from the rudimentary, through to levels of sophistication that are quite mindblowing. Most technology developers and distributors worth their salt have made demonstration versions available on their web sites. These demo versions provide users with a great opportunity for testing software before deciding if it fits into a particular workflow. This is also a great way to get new ideas for how a workflow could be improved.

Agfa (www.agfa.com)

Besides having extensive preflight capabilities in the ApogeeX RIP system, Agfa offers a light version of ApogeeX called ApogeeX Create Pro. It helps designers create printable PDFs and provides server based PDF creation. Printers that buy Agfa's Apogee Create can distribute client software to customers.

Artwork Systems (www.artwork-systems.com)

Artwork has traditionally specialised in packaging workflow management but has recently offered technologies for commercial applications. The Odystar system is one of a handful of workflow management systems based entirely on PDF 1.6, JDF and Certified PDF. It offers comprehensive quality control and output management and is configurable from basic preflight checking and PDF processing, right through to a system that can turn legacy RIPs into PDF 1.6 compliant RIPs.

Callas (www.callas.de)

This company has several options for preflight checking. The server based solution is called Process Prepress and it has a high degree of automation. Part of the Callas technology is used within Adobe's Indesign and Acrobat technologies to provide basic preflighting. The software Made To Print can preflight and create PDFs from within both Indesign and Quark Xpress.

Dalim (www.dalim.com)

There is much more than preflight checking to Dalim, but among the functions in Twist, Dalim's production workflow system, are tools for checking incoming files to ensure their printability. In Dalim's collaborative softproofing system, Dialogue, incoming files are preflight checked before entering the final proofing cycle.

Dev Zero (www.devzerog.com)

Print Secure is a solution that combines local or Internet based preflight checking with secure file transfer solutions.

Enfocus (www.enfocus.com)

The Enfocus Certified PDF technology is integrated into many of the well-known RIP systems on the market. Enfocus has also integrated it into all of the Enfocus products, such as Instant PDF, Pitstop Professional, Pitstop Server and the latest software called Pitstop Automate which is built entirely using JDF, supporting advanced file routing. The latest version of Pitstop Automate is available as an SDK (Software Developers Kit) so that other companies will be able to

use it to develop their workflow management technologies. On the www.CertifiedPDF.net website printers and publishers can publish their latest and most accurate preflighting profiles, so that customers can access profiles in order to produce printable PDFs.

Esko (www.esko.com)

This company's RIP systems are amongst the most sophisticated in the industry. They have long included preflight checking tools. Esko's Scope workflow management system includes a vast array of functions including PDF creation with the Scope Outright module. Esko is very active in the GWG, especially for ensuring that there are settings for PDF files to suit packaging production.

Fujifilm (www.fujifilm.co.uk)

This company currently offers two workflow systems, which are available to different markets. The Celebrant workflow is an implementation of Adobe's Postscript technology. Rampage, technology from the eponymous third party developer, builds workflow technology under Fuji's direction. Preflight checking tools are included in both systems.

Kodak (www.graphics.kodak.com)

Besides having preflighting capabilities in the Prinergy, Brisque and Spire RIP systems, Kodak also lets designers create PDFs according to a printer's specifications using Synapse Prepare. This technology has plug-ins to Indesign and Quark Xpress, and through these plug-ins, PDF creation and the subsequent preflight steps can be managed directly from within the layout software. Another way to perform preflight is at the point of file delivery via Synapse Insite, a collaborative softproofing system.

Global Graphics (www.globalgraphics.com)

Preflighting tools are incorporated into the single user version of Jaws PDF Creator software as well as into Jaws PDF Server. PDFs can be automatically created according to Enfocus Certified PDF profiles (Global Graphics and Enfocus cooperate on this technology). Owners of the Jaws PDF Server can also distribute personalised software clients to their customers.

Gradual Software (www.gradual.com)

Switch is a workflow suite that can include several different ways of preflight checking. The main objective though is automation, including efficient file transfer control and file handling.

Heidelberg (www.heidelberg.com)

Preflight is built into both Printready and Metadimension, Heidelberg's RIP systems. Preflight is therefore performed automatically on documents throughout the workflow and before they enter Heidelberg's collaborative softproofing system, Prinect Remote Access.

Laidback Solutions (www.laidbacksolutions.se)

This Swedish software developer's preflighting software is coupled with a mechanism for adding administrative metadata to PDF files according to the new AdsML standard.

Markzware (www.markzware.com)

This is one of an elite band of industry veterans when it comes to preflight checking technology. The Markzware technology, in products like Flightcheck, is also one of a few

Every Media Company Needs to Invest into:

- *Customer Relationship Management – spend lots on people and technology*
- *Web content management – build strategic relationships across media and technology*
- *Business Intelligence – understand the underlying dynamics of your business, its customers and the reason customers work with you*
- *Circulation technologies – understand where your products go, who uses them and why*
- *Digital production management – invest in people and workflow management technologies*
- *Advertising management – invest in ad booking, production and workflows*
- *Closed loop advertising management – deliver results, develop market expectations for advertising performance*
- *Content archiving – invest in technology to leverage your editorial and content investments*
- *Editorial systems – invest in server based, automated editorial workflows*
- *Databases – don't even think about spending all this money without a clear, cohesive database and IT infrastructure investment strategy*

applications able to handle native files, created using such tools as for example Indesign, Quark Xpress and Corel Draw. Markzware products offer a degree of automation that can be further extended with the use of Apple Script and Visual Basic. Markzware cooperates with other developers to offer integrated online solutions, and also offers server based solutions like Flightcheck Online, Flightcheck Workflow and Job2Print.

Onevision (www.onevision.com)

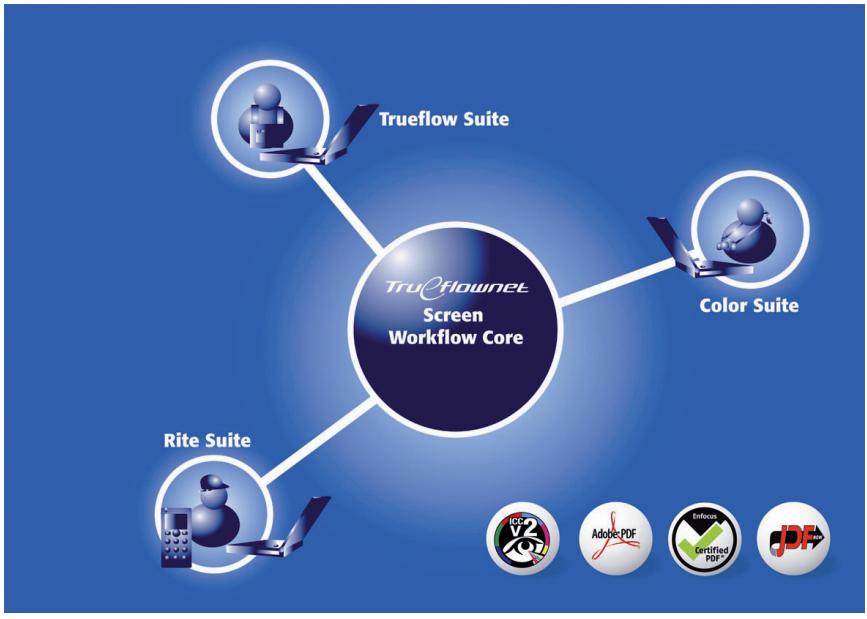
This is another veteran of the preflight and workflow management business. To describe Onevision's products exclusively as preflight checking software isn't at all fair as they are closer to RIP or workflow systems, with extremely sophisticated editing and correction tools. Onevision Asura for example provides a very powerful preflight solution with quality assurance called "Sealed Documents". Through Asura, Enterprise users can perform online preflight checking when submitting files in a collaborative softproofing environment.

Quickcut (www.quickcut.com)

Quickcut is the industry's leading developer of automated file management and distribution technologies. The company has several solutions for preflight checking, configured to support secure and database driven document delivery. Pagestore is the backbone of the Quickcut system and is used to both send and receive finished artwork. The Quickprint module has a central database containing

publisher's production profiles and file delivery specifications and this can be referenced either at the point of file origination or during PDF creation. Quickcut is very active in standards developments.

Preflight checking used to be about correcting Postscript errors, so that files wouldn't get stuck at output because the file data couldn't be processed. Over the years it has evolved in step with the prepress business to be far more about automated quality control within workflows, increasingly based on PDF. The difficulty with using PDF as a base format for prepress has been its breadth of application and the considerable flexibility with which PDF files can be configured. Much work has been done to overcome problems associated with the format's scope for abuse, most notably the development of the PDF/X specifications. Coupled with efficient and safe file transfer methods and relevant metadata, data standards are fundamental to building automated quality controlled production workflows.



At the heart of all things digital is a central data repository. Screen's Trueflownet is based on a core workflow technology plus modules supporting different activities.

Quite (www.quite.com)

A UK based software developer, Quite's preflighting technology offers some handy utilities, including colour conversion on the fly.

Screen (www.screen.com)

Preflight checking is intergrated into Screen's Truepress RIP system, so documents entering the workflow or the Riteapprove collaborative softproofing system are automatically preflight checked. Screen is also working with Artpro to develop its Trueflownet workflow system for packaging applications.