



# Workflow for the New Business of Printing

**FreeFlow™ White Paper**

Prepared by INTERQUEST, Ltd.



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# Introduction

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**T**he term ‘workflow’ is a relatively new construct, and began to be treated as a standalone discipline in the late 1980s in connection with imaging.<sup>1</sup> Yet you can be sure that Henry Ford understood what it was and what it meant to his business, just as any printer understands, either intuitively or explicitly.

Printing, like other manufacturing operations, is largely linear in nature. Discreet processes must occur upstream before subsequent tasks can be undertaken downstream. Between each of these events work in progress is usually reviewed – by production personnel and clients – and decisions made before work is routed along to the next stage of production, or redirected upstream for additional rework or revision.<sup>2</sup>

Dependent relationships characterise a great deal of the processes that occur in transforming conception and content into a deliverable product.<sup>3</sup> In the context of printing, workflow refers to all of the processes and events that occur from the time a job enters the shop to the point at which it is delivered.

The benefit of an automated workflow system is that it minimises deviations and fluctuations in these processes and maximises the use of resources. And since not all operations are linear, it can facilitate concurrent or parallel processing.

Printing is a highly customised manufacturing activity and automation has not come easy. Prepress was the first segment of conventional print production to be computerised, and scripting languages and ‘hot folder’ techniques have been employed to route files from one process to the next. Consoles for controlling on-press colour balance and registration came next, followed by computer-to-plate and direct imaging presses. Overall, however, efforts at end-to-end automation are still in their infancy.



## INTRODUCTION

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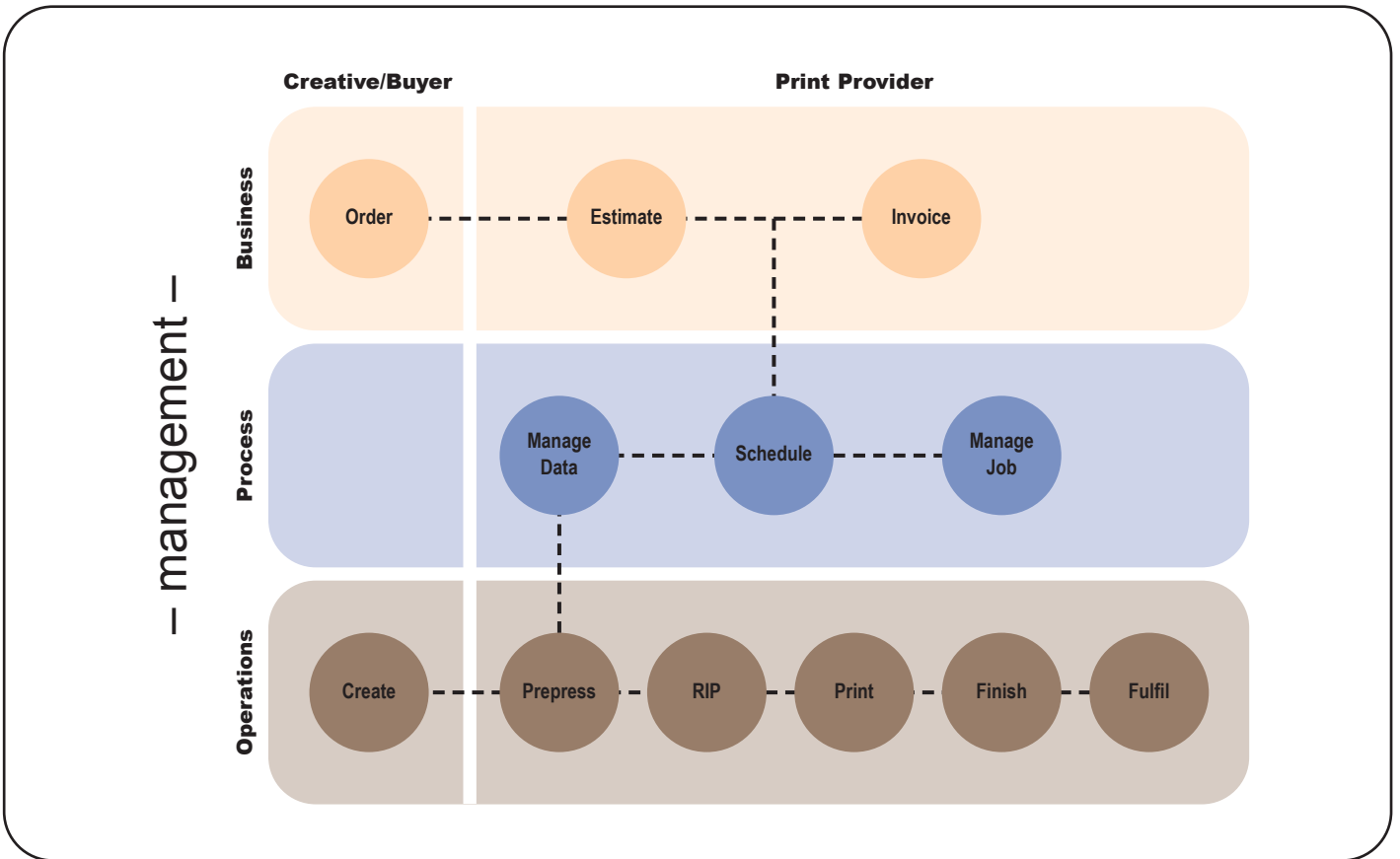
Fully computerised digital printing workflows for applications such as the production of invoices and statements have realised a much higher degree of automation, but have tended to be highly context-specific, proprietary, and inflexible. Digital printing has by and large been considered a step child of the printing industry in general, and very few efforts have been undertaken to consolidate conventional and digital workflows.

Although the particulars differ, the workflow challenges facing all printing professionals are similar, and they emanate from a combination of market forces, and both internal and external equipment and process incompatibilities:

- ◆ Ever shortening run lengths and turnaround requirements
- ◆ Manual intervention in production and administrative processes
- ◆ Discreet, process and application specific workflows
- ◆ Limited interoperability between equipment and software components

Xerox FreeFlow addresses these conditions with a multi-tiered workflow framework. FreeFlow provides an infrastructure for assembling end-to-end workflows from highly modular hardware and software components offered by Xerox and third-party FreeFlow partners. FreeFlow services include workflow assessment, systems integration, application programming support, colour management, and business development. This combination of standards, modular components, optimised partner products, and services provides the flexibility needed to address the workflow requirements of the diverse community of print providers. This white paper explores the FreeFlow model and examines how it addresses the workflow challenges facing today's printing professionals.

# FreeFlow Overview



## Scope

At its most basic level, FreeFlow provides a view of workflow from the perspective of the customer, but it is a view that extends well beyond the walls of production operations. Although Xerox has traditionally concentrated on printing, FreeFlow reaches much further upstream to encompass creative and prepress activities. It also reaches out beyond the production chain to enable better integration with process and business management activities.

The unified approach to these three dimensions – output production, process management, and business management – is perhaps FreeFlow's most unique and valuable contribution to workflow. It also signals a strategic shift in Xerox's traditional approach to its business.

## FREEFLOW OVERVIEW

*The cornerstones of FreeFlow are:*

- ♦ *Standards such as JDF*
- ♦ *Modular Xerox Components*
- ♦ *Optimised Partner Products*
- ♦ *Valued-Added Services*

FreeFlow makes it possible for print providers to develop much closer, more persistent relationships with their customers and suppliers, and to build more efficient, controllable internal workflows. It also enables Xerox to more effectively target and respond to its customers' business requirements.

### **FrameWork**

The Workflow Management Coalition (WfMC) defines workflow as "The automation of a business process, in whole or part, during which documents, information or tasks are passed from one participant to another for action, according to a set of procedural rules." This is the same goal CIP4 has for the printing industry with specifications such as Job Definition Format (JDF).

FreeFlow targets strategic points of entry into production and provides connectivity through open interfaces and standards across the full output production chain, and between process and business management components.

FreeFlow also facilitates the integration of Xerox and third-party products from strategic partners through standards, software development kits (SDKs), and application program interfaces (APIs). This ensures that third-party products not only add their own unique value to the equation, but also support the full capabilities of Xerox equipment in a fully integrated manner.

The FreeFlow strategy calls for Xerox to offer more modular products that share common platforms and components. Together with third-party solutions, this enables customers to pick the most appropriate set of tools for their businesses while protecting their investments in other technologies, which can be integrated with FreeFlow components.

## Output Production

### Creative

Ever since Apple®, Aldus®, and Adobe® revolutionised publishing the desktop and print production worlds have been moving closer together. Processes that used to be performed on high-end standalone prepress systems are now embedded in print controllers, and applications such as Adobe InDesign™ and Adobe Acrobat™ continue to reach deeper into production.

The so-called Desktop Revolution, however, isn't over because it was never complete. Today, just as it was prior to the MacintoshR computer, LaserWriter, and Adobe PostScript™, many barriers continue to separate the creative and production communities. Xerox is using FreeFlow partners such as Adobe to span both static and variable content applications and tie closer bonds between creative and production processes.

### Prepress

Prepress activities encompass an enormous range of processes which vary dramatically from one environment to the next. The prepress activities of a quick printer are quite different from those of a commercial printer. Xerox is unique in that it offers products and services across a broad segment of the printing marketplace, including commercial printers, service bureaus, quick and franchise printers, enterprise or in-house operations, and office. FreeFlow is critical in enabling Xerox to serve them all from a common framework.

*The DocuSP™ controller plays a critical role in FreeFlow by providing one common platform and one operator interface for Xerox cutsheet and continuous feed printers. DocuSP supports remote workflow, offering automation and integration into all segments of the market served by Xerox.*

## RIP

The RIP performs a similar role regardless of the target device or process. If the job is conveyed in PDF, for instance, it must be converted from a device-independent, displayable format, to device-specific information needed to drive a platemaker, direct imaging press, or digital printer. The RIP is the means by which upstream processes are conveyed to the output device.

RIPs have also tended to be highly product or process specific and production personnel have had to learn multiple interfaces and operating systems. FreeFlow enables controllers from Xerox and its partners Creo® and EFI® to perform critical production functions in a consistent and uniform manner regardless of the targeted output device. It also provides a critical link to process and business management services.

## Print

The world of print is rapidly consolidating. Digital printing is no longer confined to a handful of highly specialised vertical applications but has entered the broad arena of all output production. Yet even within the walls of facilities that offer a full range of printing services, production processes have remained largely compartmentalised, with very specific and rigid workflows supporting discreet output processes. FreeFlow provides a means to bridge these workflows, enabling greater flexibility in redirecting prepress activities to traditional and digital printing processes.

## Finishing

Traditional finishing operations often begin with the process of collating and trimming press sheets after they have dried. Digital printers, of course, produce fully collated sets and are thus more conducive to on-line finishing and binding. Xerox has long been a leader in developing online finishing that ranges from stapling and tape binding to folding, saddlestitching, and perfect binding.



## *FREEFLOW OVERVIEW*

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Xerox's Document Finishing Architecture (DFA) has enabled online integration of finishing devices from a variety of finishing partners. FreeFlow is extending Xerox's finishing support to include UP3i and to enable online, offline, and near-line devices to be driven from JDF job tickets.

### **Process Management**

Process management is the means by which devices and operations are controlled and optimised in a production environment. The requirements, again, are quite unique depending upon the services, infrastructure, and equipment profile of each customer. Process management may encompass:

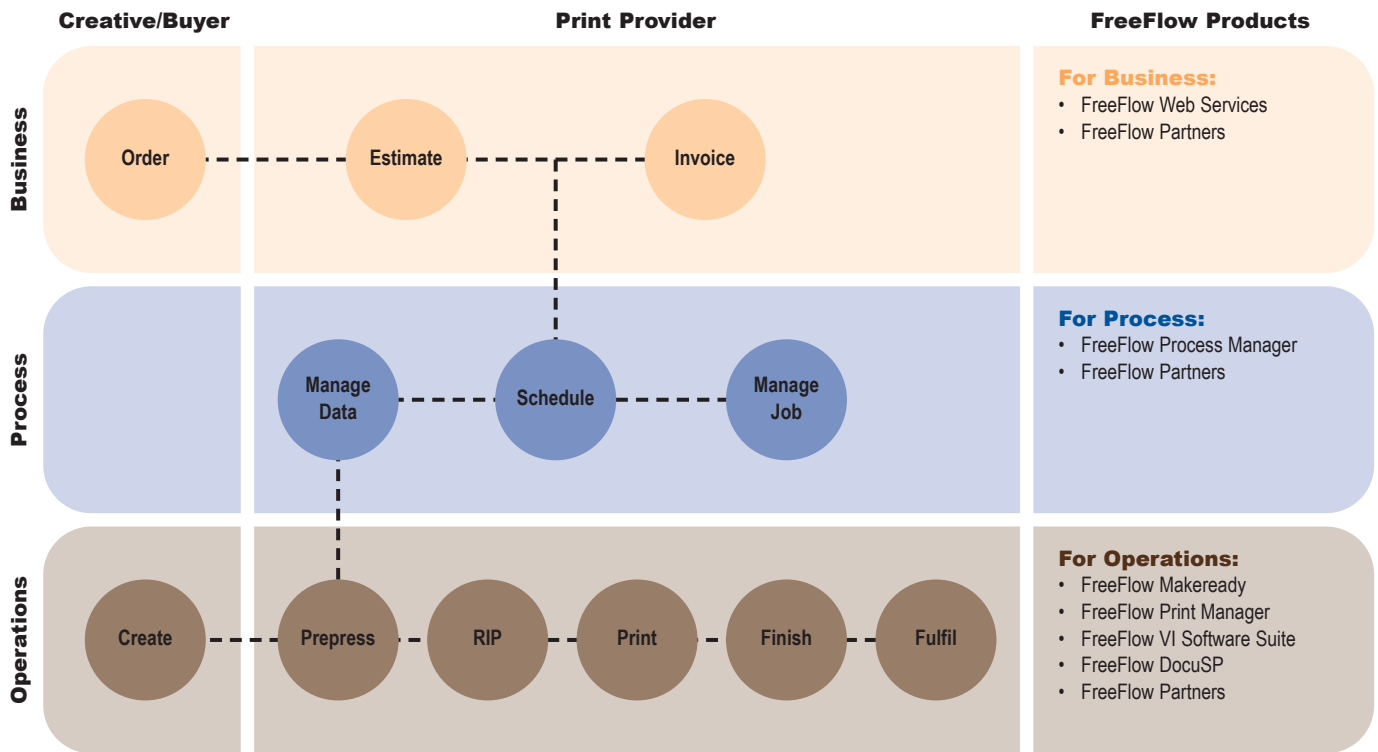
- ◆ Storage, retrieval, and archiving of jobs
- ◆ Shop floor control, including scheduling, routing, and load balancing
- ◆ Status reporting, exception processing, and job recovery
- ◆ Process automation

FreeFlow embeds process control in the workflow framework in order to optimise not only production processes, but business operations as well.

### **Business Management**

Business management closes the loop between the production environment, customers, and suppliers. It provides customers an interface to the print shop through which they can request quotes, submit jobs, proof and sign off on work in progress, and receive information on the status of their work. For the print provider business management extends beyond establishing a digital storefront. It also encompasses operational and administrative functions such as customer billing and supply chain management.

# FreeFlow Digital Workflow Collection



*FreeFlow wraps Xerox products around common platforms and architectures. It develops component capabilities out of products such as DigiPath so that modules can be assembled into customised workflows.*

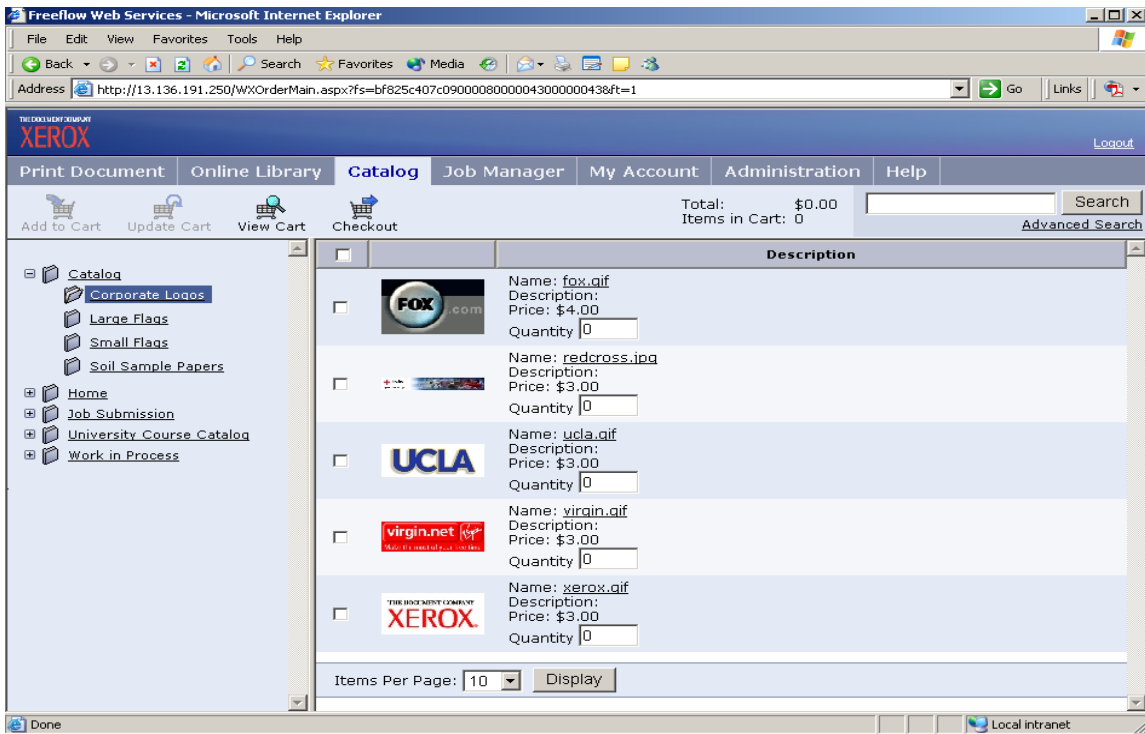
- ◆ **FreeFlow Web Services** provides a customer interface into the creative and production environments and is a critical component in linking business with output and production management
- ◆ **FreeFlow Makeready** provides prepress tools such as scanning, late-stage editing of PDFs, and colour management
- ◆ **FreeFlow Process Manager** is a Graphical User Interface (GUI) providing drag-and-drop PDF automation of production processes
- ◆ **FreeFlow Print Manager** is an integrated print manager/job ticketing component for controlling a full range of monochrome and full-colour cutsheet and continuous feed digital printers
- ◆ **FreeFlow Variable Information Suite** is a collection of tools and technologies for producing a full range of variable data jobs ranging from simple personalisation, promotional transactional, and cross media, one-to-one publishing applications

# FreeFlow Web Services

**M**ost providers in the printing industry are focused on establishing closer, longer lasting business relationships with customers. FreeFlow Web Services enables print providers to build highly customised interfaces for individual clients. Web-based catalogue ordering is one example.

Web-based fulfillment is evolving into a sophisticated extension of print-on-demand, enabling companies to efficiently manage marketing and product collateral. FreeFlow Web Services utilises login profiles to trigger the appropriate level of access so that customers are able to view, modify, and order their own collections of documents. When the status of a job is updated during the production process, an e-mail notification is automatically sent to the customer.

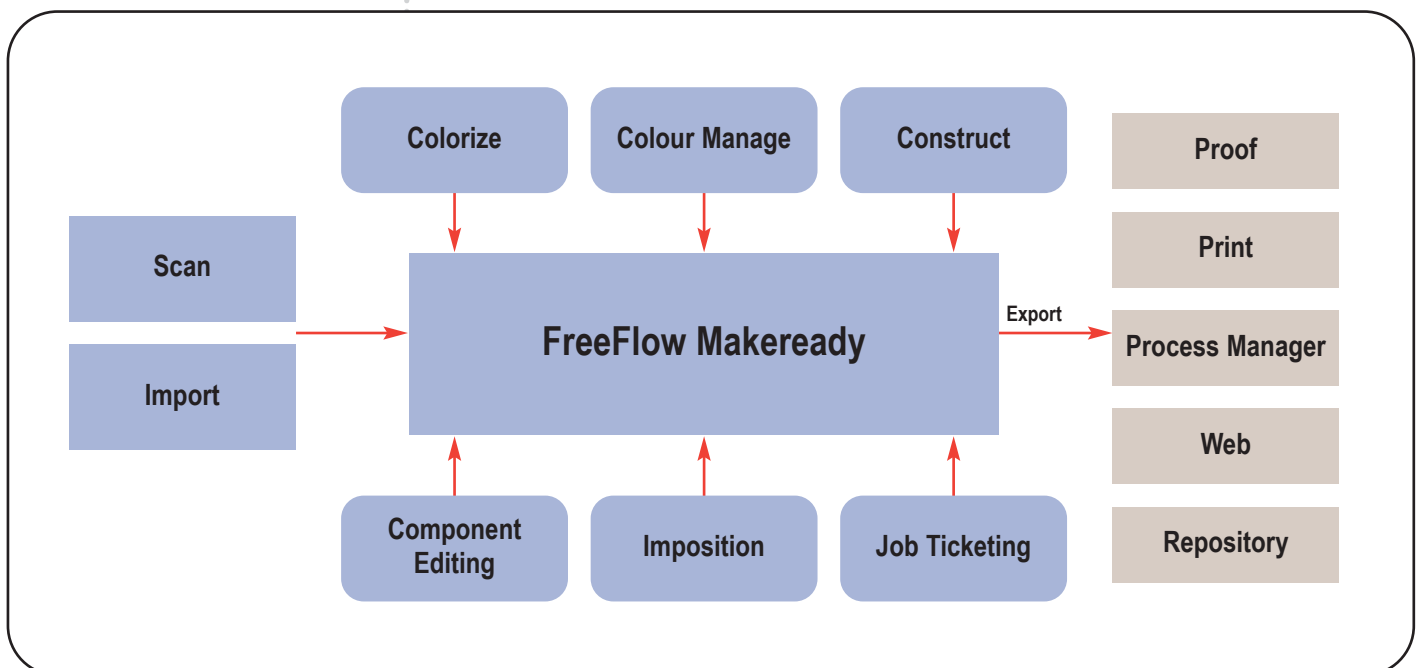
*FreeFlow Web Services establishes a digital storefront that can be tailored to the requirements of each customer. The login profile determines the access level of the customer, enabling the print provider to set up customer libraries where existing jobs can be viewed, modified, and reordered, and new work downloaded and submitted. The same Web server can be used by the print shop operator to manage jobs, program job tickets, and submit jobs to the appropriate digital printer.*



# FreeFlow Makeready

**M**akeready constitutes the hub of any production environment and spans a wide gamut of operations ranging from simple hardcopy scanning in quick print and reprographics operations to sophisticated colour management and the preparation of page impositions for commercial printing. FreeFlow Makeready is a suite of fully integrated Xerox and third-party products designed to automate typically labour-intensive makeready operations. These component solutions can be used by print providers to assemble customised workflows suited for their operating environments.

Content is brought into FreeFlow Makeready in the form of hardcopy scans or electronic files. The FreeFlow scanners are optimised to scan directly to PDF with associated colour profiles. Black-and-white or colour scanned images are made available to operators instantaneously for additional makeready operations. Files can also be imported into FreeFlow Makeready in PostScript, PDF, TIFF, or JPEG format. The scanner performs many operations such as deskewing and the automatic segmentation of pages into text, graphics, and images on the fly at full speed.



## FREEFLOW MAKEREADY

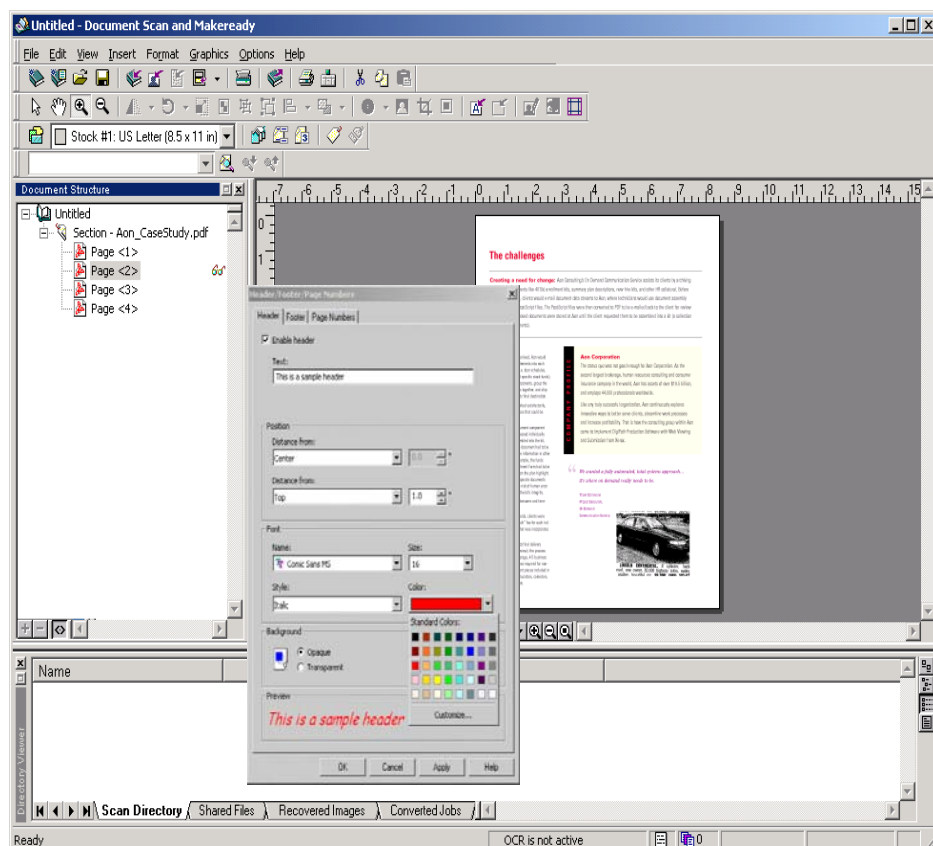
Third party products such as Adobe Photoshop™ are fully integrated into FreeFlow Makeready and can be used to enhance or manipulate scanned and imported images. The Adobe PDF Library is used to enable component editing of imported PDF files regardless of the original creation applications. PDF components can be exported to multiple files or recombined.

Files can be exported out of FreeFlow Makeready for a range of downstream operations. The output could be directed to a production printer, complete with an electronic job ticket, or to a FreeFlow or third-party repository, or uploaded to FreeFlow Web Services. A low resolution file could also easily be exported for Web applications.

*Since Adobe Photoshop is fully integrated into FreeFlow Makeready the operator can track changes and 'undo' edits made with Photoshop and any other FreeFlow component that is used.*

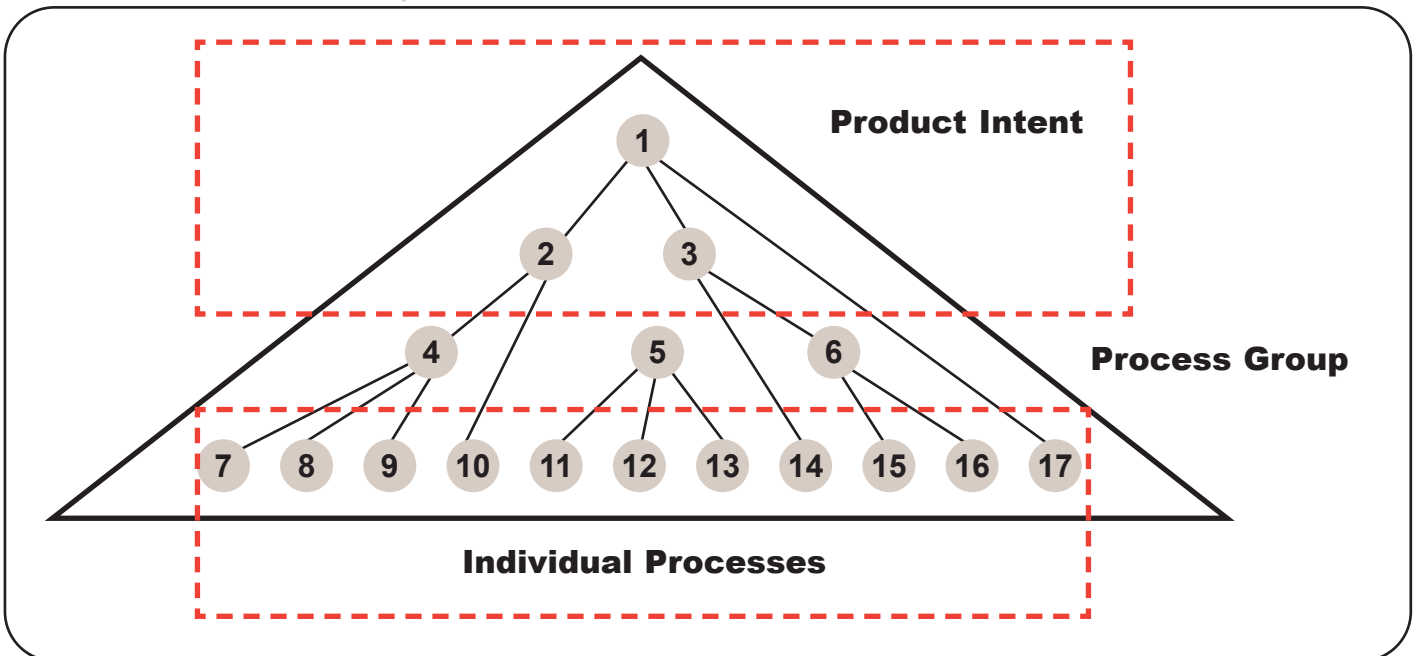
*Other operations that can be performed include:*

- ♦ *Colorizing scanned images*
- ♦ *Late-stage editing of PDF*
- ♦ *ICC profiling and colour management*
- ♦ *Adding watermarks, merge items, annotations*
- ♦ *Trapping*
- ♦ *Registration*
- ♦ *Impositioning for cutsheet and continuous feed equipment*
- ♦ *Complete job ticketing including tabs, inserts, and chapter construction*



# FreeFlow Process Manager

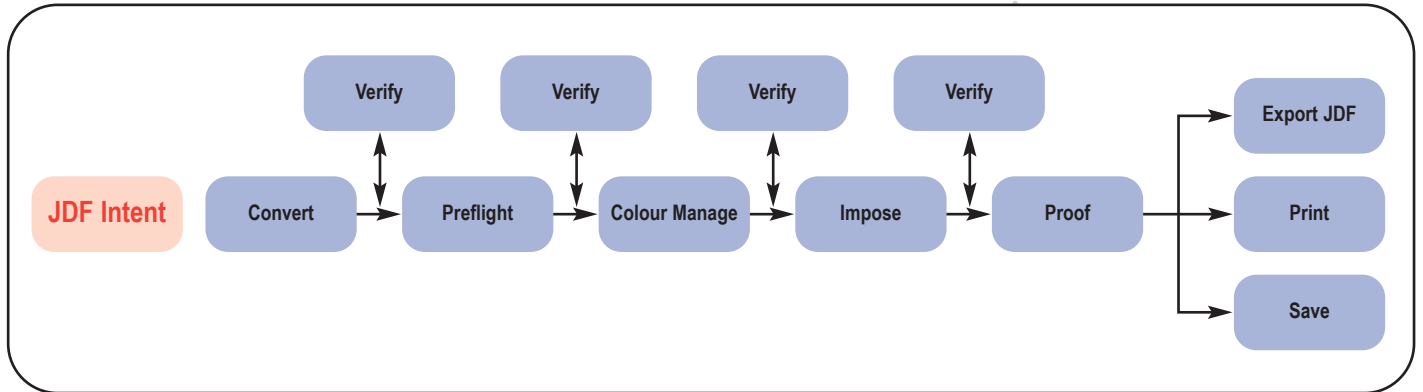
**J**ob specifications have traditionally been conveyed to print providers from advertising agencies or design departments through a combination of verbal instructions, forms, and mock-ups. When the job goes into production, the product specifications are manually translated into the processes required to produce it correctly and efficiently. FreeFlow utilises JDF (Job Definition Format) to enable a more efficient and collaborative workflow between creative and production environments.



Production processes in JDF are represented by “nodes”, which are used to describe the finished product. The description of the finished piece is called **product intent**.<sup>4</sup>

In the FreeFlow workflow, a plug-in from Adobe automatically generates a JDF-specified document from a creative application such as InDesign or Acrobat. FreeFlow Web Services or collaborative workflow software such as Creo Synapse InSite™ can be used to submit the job to the production shop where it is electronically routed to the FreeFlow Process Manager.

## FREEFLOW PROCESS MANAGER

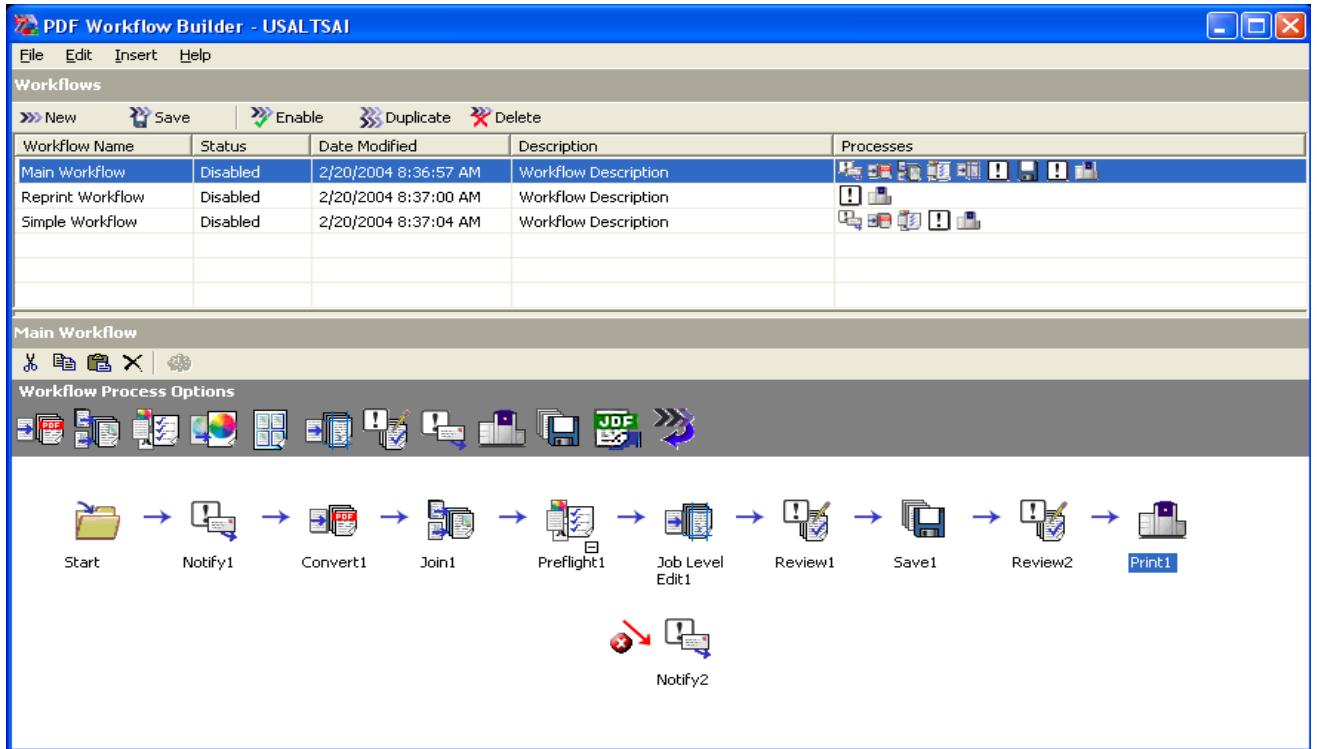


The Process Manager converts the JDF-encoded product intent into process intent, which automatically programs the nodes of a selected workflow. The prepress workflow could include preflighting the job, colour correction, trapping, and generating a multi-up imposition for printing. Production proofs could also be electronically routed to a designer or even directed to a printing device at another location.

Far beyond this critical task of converting intent into process, Process Manager enables the production facility to automate the execution of process tasks by providing a simple drag-and-drop GUI for detailing the sequence of events and routings. An incoming PDF file can be automatically routed from one operation to the next dependent upon the results of each step. In this manner, fully automated prepress workflows can be set up to minimise operator intervention and training. Customers can also be provided with Adobe client software to simplify and automate the creation of PDF files from a variety of file formats and applications.

*Adobe originally developed the Portable Job Ticket Format (PJTF) to carry device-specific parameters for a PDF file. PJTF could be embedded in a PDF document or conveyed as a separate file. Adobe was one of the original founders of JDF, which was eventually turned over to the CIP4 organisation. PJTF is now a key component of JDF.*

FREEFLOW PROCESS MANAGER



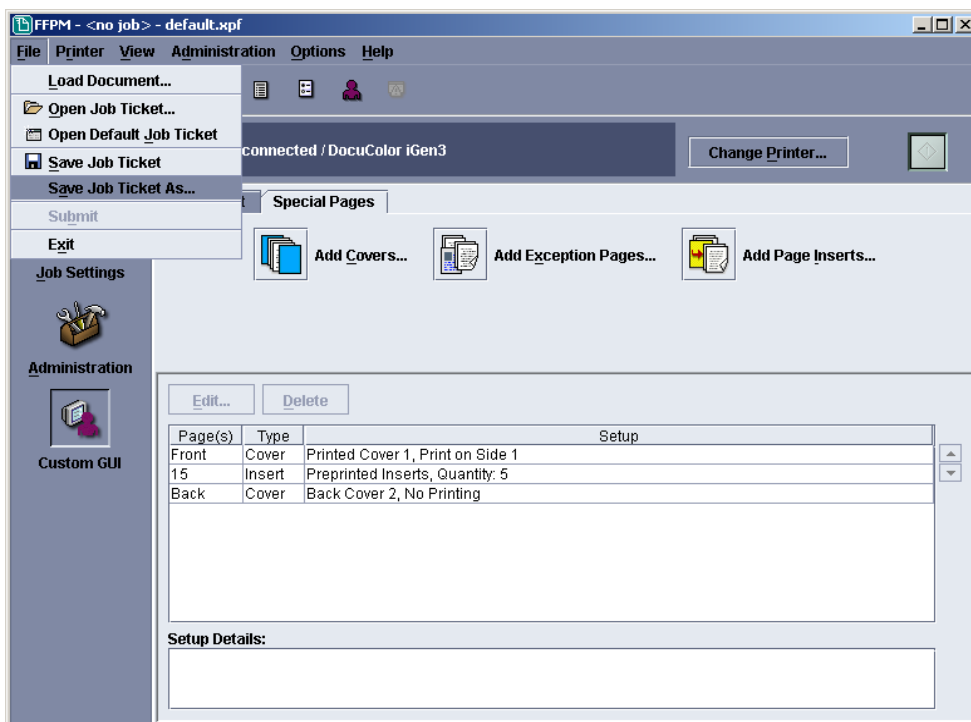
PDF is an ideal format for automated prepress workflows due to its inherent stability and compactness. Even though PDF – like PostScript – is device independent, a PDF file can be incrementally updated with device-specific instructions such as colour management, trapping, and imposition. These instructions can be appended without having to create a new PDF file.

# FreeFlow Print Manager

**F**reeFlow Print Manager provides access to the full range of Xerox printers through a custom Graphical User Interface (GUI). It can be used to check the availability and status of printers, and program a full range of job parameters that match the capabilities of each printer. Within the context of the FreeFlow workflow model, Print Manager mobilises the process of configuring a device for final production by integrating the setup function into other workflow components. Thus, job ticketing can be performed from FreeFlow Makeready applications, or accepted in JDF format from other applications outside the workflow framework.

FreeFlow Print Manager for Creo Prinergy™ is an integrated job ticketing workflow that works with Xerox digital production equipment driven by Creo Spire™ and Xerox DocuSP controllers, including the iGen3™, DocuColor 6060™, and Nuvera™ publishers. The solution uses JDF or XPIF, and also allows the user to perform late-stage editing of the programmed job ticket to enable Prinergy operators to program setup information and direct a job to digital equipment. In the future, Print Manager will be used to further integrate digital printing into other graphic arts processes as well.

*Most of the efforts of CIP4 have focused on traditional printing processes. Xerox is working with CIP4 and Networked Graphic Production (NGP) to address digital printing through active participation on committees and working groups. More than 40 Xerox employees serve on standards organisations.*



*Jobs are submitted to Xerox equipment using the Internet Print Protocol (IPP) submission protocol. The Xerox Print Instruction Format (XPIF) is an XML encoding of the IPP specification and job ticket instructions are based on IPP attributes. Because Xerox's job ticketing format is based on XML, instructions received in JDF, which is also XML based, can be seamlessly converted into XPIF.*

# FreeFlow Variable Information Suite

**E**stablishing a personalised printing workflow is especially challenging because it bridges so many discreet systems and organisational structures. The data needed to populate a personalised promotional document in order to increase its relevancy may be resident on mainframe computers and complex database systems. The design components, on the other hand, are usually created with client/server or workstation applications.

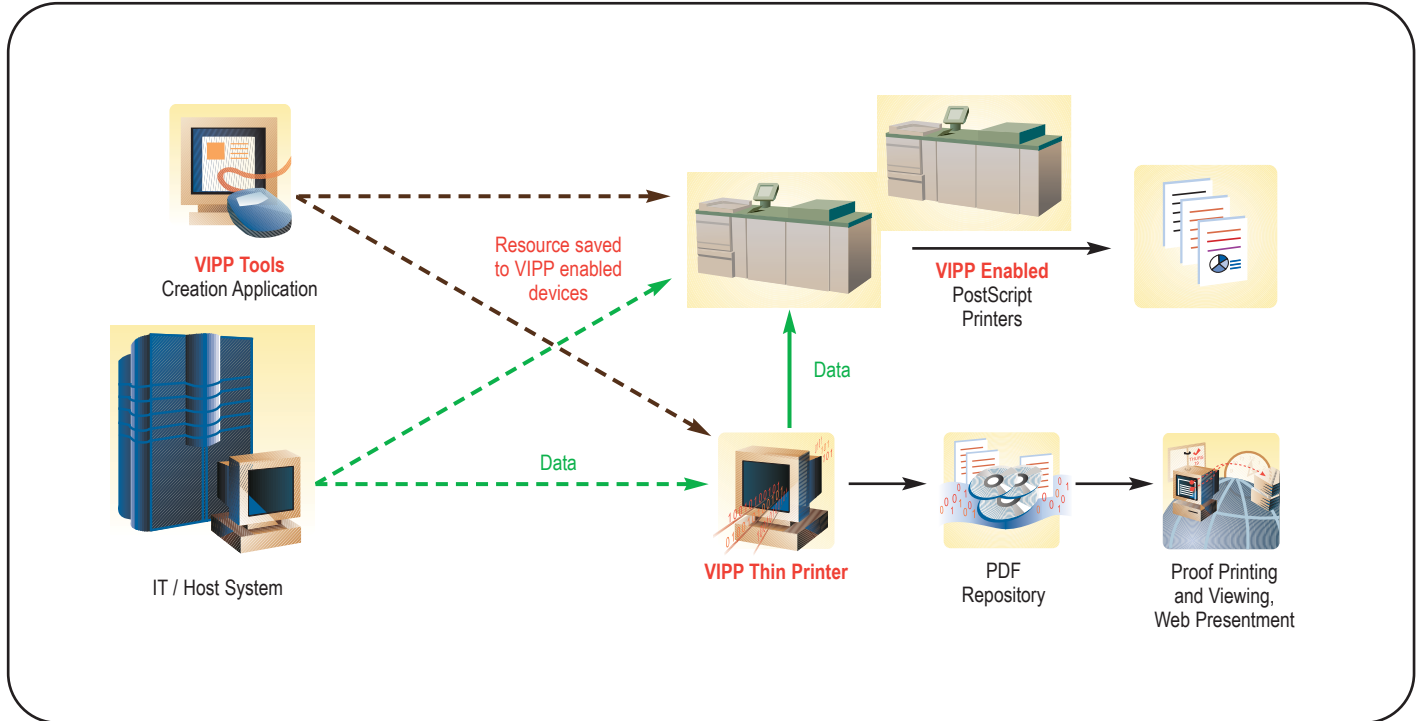
Mainframe variable data printing workflows often merge line data with preprinted or printer-resident forms. This approach is highly efficient, but very inflexible. The challenge in moving into full-colour personalised printing is in combining the data with design elements in a dynamic, but equally efficient manner.

Xerox has extensive resources and expertise in transactional printing which it drew upon in developing VIPP as a bridge between legacy and PostScript workflows. VIPP jobs can be configured in two ways. **Native mode** files have VIPP commands embedded with the data. **Line mode** VIPP uses raw, unaltered data feeds. Composition and assembly instructions in line mode are contained in a separate file, and the data can be in the form of line data or field delimited records from a database.

VIPP coding can be generated in a number of ways. Users with the necessary programming resources can write their own code from scratch, or use Xerox's Interactive Design Environment (IDE). They can also be given access to a variable data SDK to build their own applications and workflows. This same SDK is available to third party developers who offer off-the-shelf composition and layout tools for emitting VIPP.

*VIPP is an extension of the PostScript programming language and will run on any PostScript compatible printer, including licensed third-party network, work-group, and production printers.*

FREEFLOW VARIABLE INFORMATION SUITE



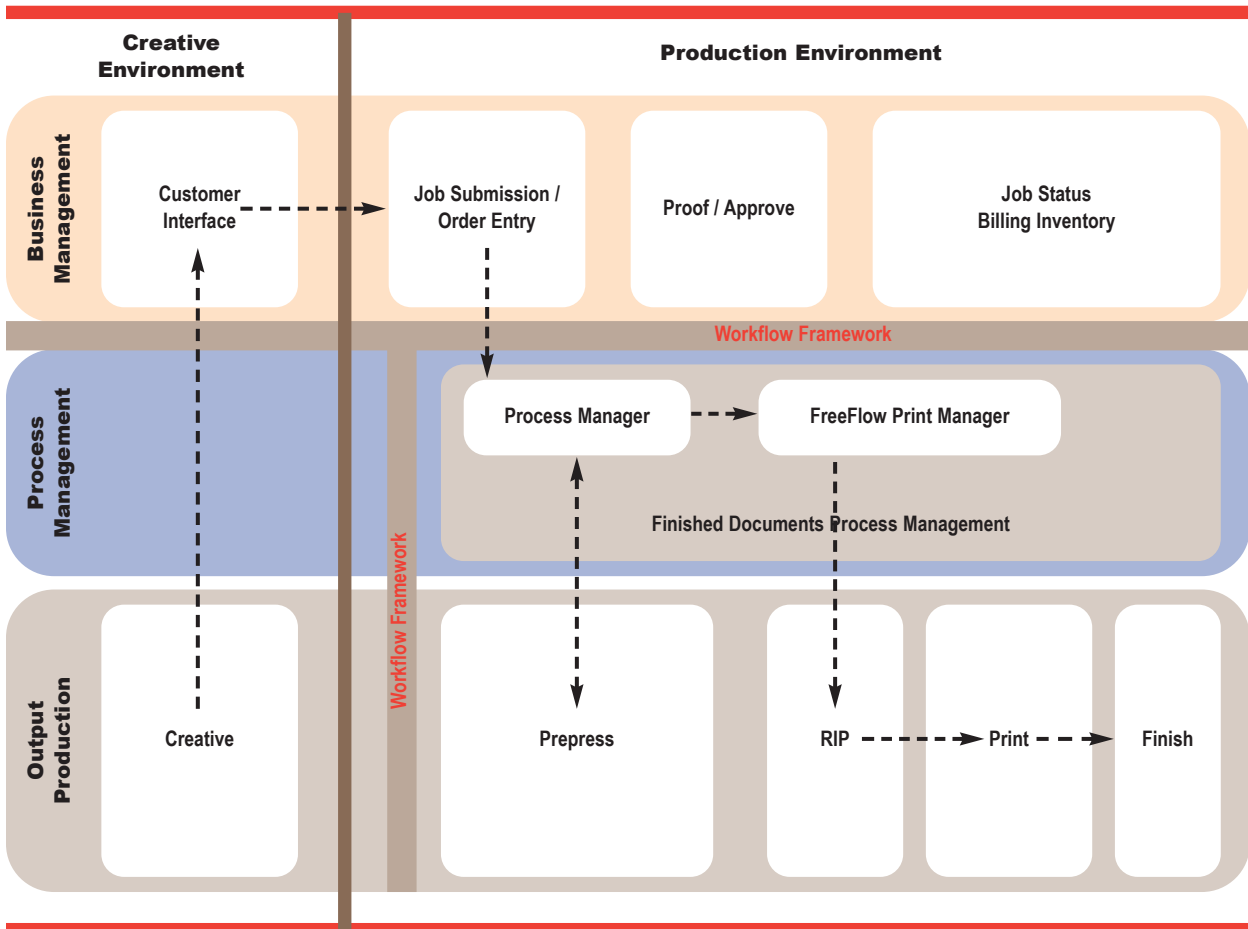
The VIPP Thin Printer can be used to generate PDF files for proofing, electronic billing applications, or archiving. Since VIPP is compatible with any PostScript printer, Xerox and third party network and workgroup printers can be plugged into the workflow for proofing and document regeneration.

Benefits include:

- ◆ Printer runs at rated speed
- ◆ Easy migration of legacy data to promotional variable data applications
- ◆ Closer collaboration between design, data management, and production
- ◆ Flexibility

*Line mode VIPP places few if any special requirements on the applications used to generate data, making the migration of traditional legacy data to full-colour personalised documents with data-driven content painless. Since the data is entirely separate from the composition and design elements, data transfer is much easier. VIPP coding marries the data with the design intent and dynamically constructs the job at the controller.*

FREEFLOW WORKFLOW COLLECTION



Typical FreeFlow workflow from the creation of a JDF-ticketed PDF, customer submission of the job via FreeFlow Web Services, automatic routing through Process Manager and Makeready, and on through FreeFlow Print Manager to RIP, print, and finish operations.

# FreeFlow Applications

**F**reeFlow is designed around modular solutions from Xerox and certified FreeFlow partners. The products use open interfaces, SDKs, and APIs to facilitate interoperability and integration. This approach is designed to enable customised workflows to be built for highly targeted applications.

Xerox is currently working with more than 100 business partners. Twenty-five partners currently offer 31 products which are officially “optimised” for FreeFlow. This means the products are utilising Xerox SDKs and have passed a certification process. FreeFlow SDKs include:

- ◆ Digital Press
- ◆ Controller
- ◆ Variable Data
- ◆ Prepress

The software development kits ensure the products are fully integrated into the FreeFlow workflow and make full utilisation of production devices.

## Unified Offset & Digital

Printing operations have usually made significant investments in equipment and software. This is especially true in the area of prepress where technology has advanced more rapidly and there is a more frequent turnover of systems. The efficiencies offered by computer-to-plate systems have led many printers deeper into the digital world. Many operations have also invested in prepress workflow management systems such as Creo Prinergy.

FreeFlow Print Manager can be integrated into existing offset workflows. This leverages existing prepress equipment and skills and offers more production flexibility and versatility.

### *Applications of FreeFlow:*

- ◆ *Unified Offset & Digital*
- ◆ *Print On Demand & Web-to-Print*
- ◆ *Book Publishing*
- ◆ *Personalised Communications*
- ◆ *Promotional Transactional*

### *Software vendors who currently offer optimised products include:*

- ◆ *Atlas Software BV®*
- ◆ *Barr Systems, Inc.®*
- ◆ *Creo, Inc.®*
- ◆ *Document Sciences®*
- ◆ *EFI, Inc.®*
- ◆ *iWay Prime®*
- ◆ *Lytrod®*
- ◆ *Meadows Publishing Solutions®*
- ◆ *XMPie, Inc.®*

*In recent years both monochrome and colour digital equipment has been placed into many different production environments. It is no longer uncommon to find a mixture of traditional and high-volume digital devices in commercial print, quick print, service bureau, and in-plant operations. FreeFlow Print Manager enables these facilities to consolidate offset and digital workflows.*

## FREEFLOW APPLICATIONS

*Within the FreeFlow framework, the Prinergy Process Plan editor could be used to normalise PDF files and perform conventional prepress operations such as colour matching, trapping, and optimising images and registration.*

*Xerox virtually created the print-on-demand market with the DocuTech. With the DocuColor iGen3 it is helping create another market for high-quality, full-colour longer-run digital printing.*

The FreeFlow Print Manager is fully functional within the Prinergy environment. The Prinergy operator is able to view available printers and their status. A job submitted from Prinergy to the FreeFlow Print Manager is assigned a job ticket, and the operator is able to configure the printer. If a JDF ticket has already been attached to the job it is passed through Prinergy and interpreted or “consumed” by the Print Manager. After programming, the job ticket can be saved in JDF or Xerox Production Input Format (XPIF) job ticket format for later use.

FreeFlow also enables printers to add to their existing services with applications such as versioning and one-to-one publishing. It provides an efficient workflow for processing short-run, fast turnaround work and opens up on-demand printing, Web-to-print, book publishing, and cross-media publishing.

### **Print On Demand & Web-to-Print**

The just in time delivery of printing introduced a host of new requirements into production facilities, including more jobs, a wider variety of formats and finishing, and shorter turnaround requirements. Equally important it placed a far greater burden on administrative functions such as order processing, job tracking, and chargeback.

On-demand printing operations thus stand to benefit substantially from automated workflow. The flexibility of the FreeFlow workflow model enables on-demand printing operations ranging from quick and franchise printers to corporate in-plants and commercial printers to build time and labour saving workflows and manage a greater number and variety of jobs.

FreeFlow can be used to tackle repetitive tasks such as hardcopy scanning as well as add new value-added services. Fast, efficient direct scanning to PDF is one example, enabling operations to better match employee skills to production tasks.

Web-driven catalogue ordering provides efficient and easy access to electronic warehouses of forms and documents. Quick printers and in-plants can also take advantage of entry-level personalisation and one-to-one marketing services by providing a much-needed bridge to MIS.

## Book Publishing

Digital printing and the Internet are transforming the traditional book publishing industry. Book publishers typically print a large number of books in one print run with a high risk that some of the books will never be sold. Digital printing technology enables the publisher to profitably manage a broader range of titles that never go out of print and to publish books for niche markets. Many digital book printing operations run a variety of digital cut sheet and roll fed equipment that complements traditional sheet and web-fed presses.

FreeFlow helps book printers establish efficient workflows, including scan to PDF, document makeready, process management, document management, and ordering. FreeFlow provides workflow tools to proof and print any type of book, manual, or catalogue. Books can be set up as PDF documents and printed on digital colour, digital monochrome, or offset equipment. The workflow to create the PDF master is consistent for all of these operations. FreeFlow products can be applied to all types of books from ISBN books to product manuals, retail catalogues, and marketing brochures. The FreeFlow workflow enables a book printer to provide digital applications in order to stay ahead of the rapidly changing business of print.

*FreeFlow targets book publishing requirements on a variety of fronts. FreeFlow Makeready offers a digital canvas for performing precise page impositions on continuous feed equipment. Front-to-back alignment can be checked and verified on every page of the job prior to sending it to the continuous feed equipment. This saves set-up time and eliminates waste on the press. If the same job is directed to a cutsheet machine, a digital light table can be invoked to check registration in the new format.*

*Xerox and a handful of other suppliers forged the way for high-volume black-and-white variable data printing in the late 1970s with products such as the Xerox 9700. Now Xerox FreeFlow components are enabling a range of personalised communications, including direct marketing, customised Web fulfillment, cross media one-to-one publishing, and promotional transaction printing.*

## **Personalised Communications**

Today variable data is being used not just to inform and comply, but to promote, clarify, and add value to a wide range of communications delivered through a combination of print and other media.

FreeFlow components are especially valuable in assembling workflows that blend print with online communications in a variety of cross media applications such as the combination of 401K statements with online newsletters and personalised, in-depth financial information. Cross media services can help customers cut postage costs while driving more traffic to their Web sites. These services also enable printers to expand and increase the value of their Solutions.

The FreeFlow Variable Information Suite includes technologies such as VIPP that are optimised with DocuSP, EFI, and Creo controllers to drive production colour printers such as the iGen3 at rated speed.

## **Promotional Transactional**

Xerox continues to apply its considerable expertise and resources in the arena of transactional printing. DocuPrint™ capabilities have been integrated into the DocuSP controller which can natively process a range of common host print data streams, including IPDS, and now supports parallel processing for increased throughput. FreeFlow partners also offer integrated tools to managing high-volume transactional printing operations.

The adoption of colour in transactional printing environments is due in no small part to current workflow deficiencies. FreeFlow bridges the gap that exists in most corporations between the Data Center and Marketing, enabling a closer collaboration on a range of promotional transaction applications such as direct mail, and cross-selling opportunities on bills and statements.



# Conclusion

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**D**igital printing is rapidly merging with conventional print production. At the same time, the printing industry in general is being folded into a variety of other communications media such as the Internet. The confluence of these trends places enormous pressure on print providers to rethink and retool their internal operations as well as their business relationships. And while some may not view these as workflow challenges, they are exactly that.

FreeFlow is an innovative and ambitious approach to these challenges, and reflects a great deal of deep-rooted restructuring on the part of Xerox. Perhaps more than anything else, FreeFlow is a recognition and a response to the changing role print now plays since it provides a framework around which print providers can not only optimise and expand their services, but effectively integrate those services into the businesses of their customers.

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<sup>1</sup> Mordechai Beizer, "Interesting Times for Workflow Technology," <http://www.wfmc.org>.

<sup>2</sup> See Gary Poysick and Steve Hannaford, *Workflow Reengineering* (Mountain View, CA: Adobe Press, 1996), *passim*.

<sup>3</sup> For an excellent examination of workflow in a manufacturing environment see Eliyahu M. Goldratt, *The Goal*, 2d ed. (Great Barrington, MA: North River Press, 1992), "Introduction."

<sup>4</sup> Based on, Catherine Dammann, "Job Definition Format: A Catalyst for Electronic Business Data Exchange in the Commercial Printing Industry." Thesis in Business Computer Science, University of Applied Sciences Bielefeld Faculty for Business and Management Studies (May 2003), p. 26.



## Acknowledgments

Thanks are due to the following Xerox employees who spent considerable time explaining the strategy, architecture, and technical aspects of FreeFlow: Daniel Bell, Nelson Bright, Dan Hufnagel, Jaime Lopez, Robert Justus, Marina Kalika, Karl Kaneen, Kevin McPherson, Brian Rooney, Joe Rouhana, and Sue Siani. I'm certain they will recognise their contributions, or forgive me if they do not. Special thanks to Larry Zusman for his guidance and patience, and to Mike Harvey for his support.

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### INTERQUEST

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