JDF: Where to Begin

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Recently the International Cooperation for the Integration of Processes in Prepress, Press and Postpress (CIP4) association released version 1.1 of the Job Definition Format (JDF) specification to the public. JDF is a significant development in the graphic arts industry, and version 1.1 provides a very clear introduction to XML's use in ebusiness and process automation, an easy to follow explanation of JDF's role, and it is much more mature than JDF 1.0.[1] Now that the standard is established, there is variety of questions to be answered:

- How can users and providers of graphic technology implement JDF?
- What are the issues to watch out for?
- Where do users begin?
- Which companies are introducing JDF-enabled software and systems?
- Will the standard stick?

Implementation Strategies: The Many Faces of JDF

Understanding the various roles of JDF is the first step users and providers of graphic technology in making their implementation plans. First of all there are three basic applications of JDF:

1. To develop "job tickets" that describe a print job,
2. To provide a means for plant MIS systems to organize command, control and configuration of plant automation and job production, and
3. To provide a common controller language for all production devices on the plant floor.

A "job ticket" is a bit of misnomer — A JDF job ticket may literally be a document that describes the requirements of final printed product or its production instructions, but it also may be data contained in a database (as opposed to and XML document) that when exported meets the requirements of a JDF job ticket and can be validated. There is a lot of subtlety in the previous two statements, so let's break it down.
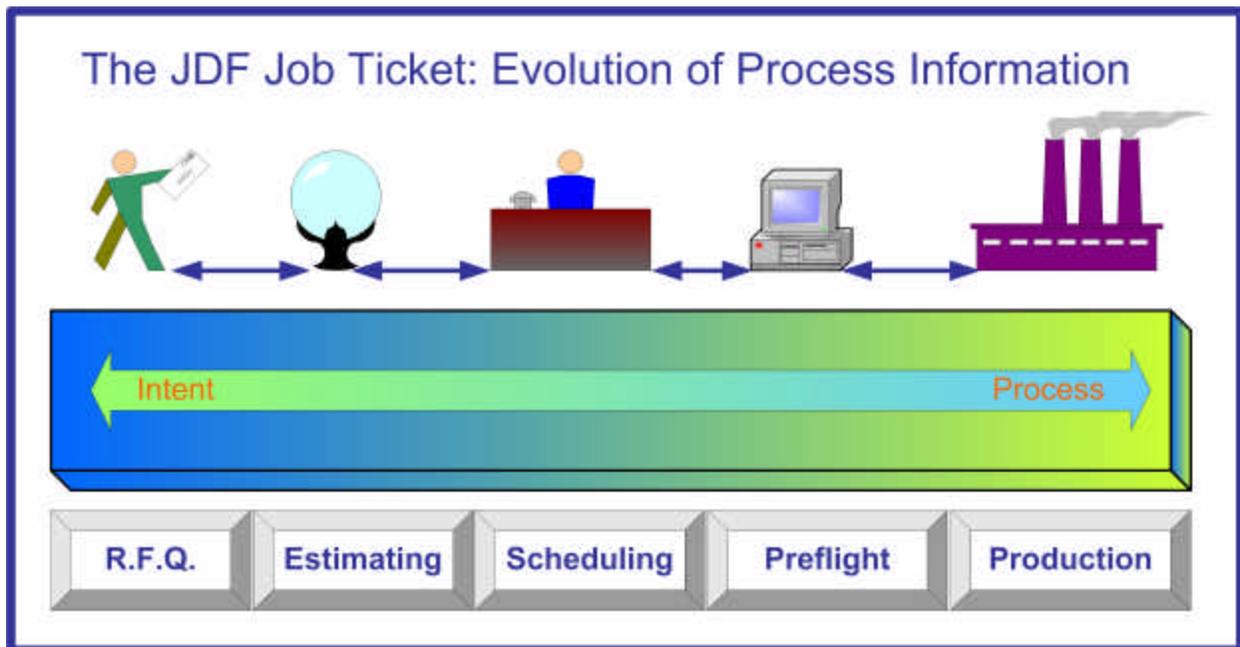
The Job Ticket in a Traditional Role

There are two basic types of job ticket information that can be gathered into a JDF job ticket: intent and process instructions. "Intent" is usually the level of information that a print buyer may put into a request for quote or a sales representative or customer service representative may provide to a print buyer in response to a quote.

A customer may request a price on "10,000 copies of 6"x 9" 176 page case bound book on a 60 lbs "cream" offset paper (black only), with foil stamp on the spine, and a four-color one-side cover wrap, printed on an 80 lbs "bright white" cover stock, from provided QuarkXPress files. Proofs and check-copy dummy required." Can you provide a quote based on that information? Sure, but can you schedule or produce the job? No.

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[1] See http://www.cip4.org/ and select "Documents" and then "JDF Specifications" to download a copy of the entire specification.

For production you need to confirm the actual stock is inventory, determine which proofing methods will be used, possibly order the die stamp, etc. Such information may be provided back with the quote, in effect taking some "intent" out of the "job ticket" and adding more specific production data. However, before the job actual prints, you'll want to know many more specifics, such as the type of stitching that will be used, detailed case binding and gluing parameters, and so on. By the time the book goes into to production the job ticket is 100% process and production instructions and 0% "intent."

The JDF Job Ticket: Evolution of Process Information

Intent   Process

| R.F.Q. | Estimating | Scheduling | Preflight | Production |

Job ticket information may originate from many sources, and in many cases the information can be set as defaults or captured from existing sources. Depending on your workflow, you may capture JDF intent and process information from:[2]

- Customer files and meta data,

- JDF-enabled preflight software that captures data from files and may also prompt print buyers for additional information,

- Your customers through your company's website or via an e-commerce partner,

- Defaults and presets on your own equipment (Ex. You may have a wire stitcher that is capable of five or six types of staple folds, but one is used as the default in 99.99% of your jobs.),

- Job "profiles" and defaults set in your MIS systems, including estimating, scheduling, workflow, and inventory control modules, and

- Direct entry.

In regards to process information, JDF organizes process instructions, parameters, and workflow using a simple but very flexible design. All things JDF are organized into *process nodes* and *resources*, and like Lego® building blocks, you can 'snap together' the components

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[2] The products in the *JDF Job Ticket Software* chart below represent this diversity of Job Ticket data sources, and they are not necessarily standalone applications.

of production to meet your workflow and production requirements. Process nodes carry out functions that can either be virtual (Ex. Preflighting) or real (Ex. Platsetter). Each process requires certain input resources and produces output resources. For instance a platesetter requires plates, a file to process, and processing instructions (e.g., input resources). Once all resources are available the job can be produced and the result (e.g., output resources) are the final imaged plates. These plates become the input process for the next "node," which in this case is likely to be the printing press.
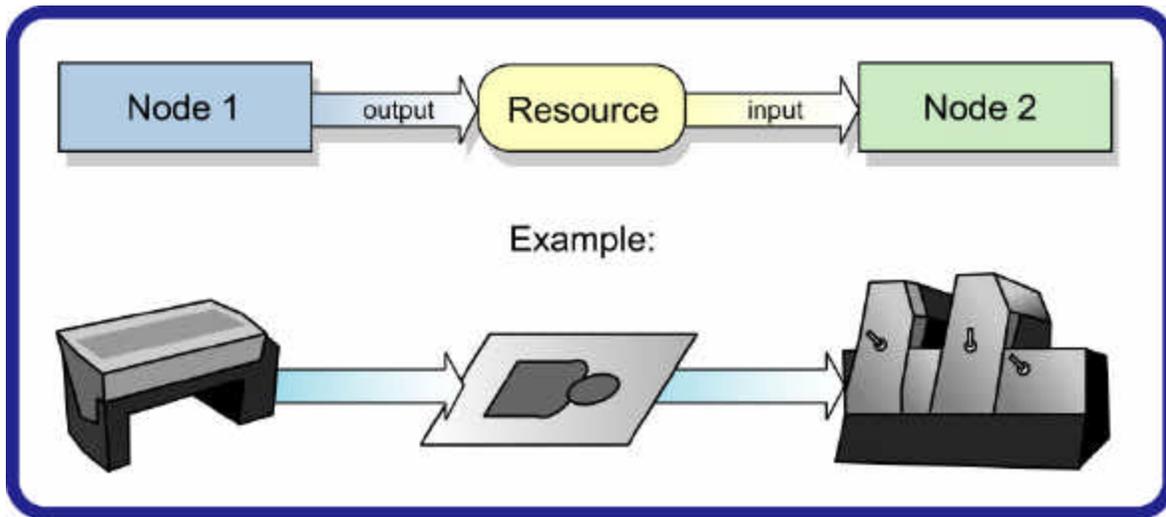
JDF Nodes & Resources (*Courtesy of CIP4*)

Any workflow can be broken down into these basic elements and there are provisions in JDF from some advance options. For instance, a resource that is continuous and renewable, such as ink, may have may be considered as an available input resource until a sensor determines that the ink vat or well is low, and once the ink vat or well is replenished, it goes back to an "available" status. You can even tie together common processes using "pipelines" so that several sub-process act as one.

I should also note that this same model is applied by JDF to many ebusiness processes as well. JDF supports PrintTalk, and in fact *is* the PrintTalk technical specification. Many of the business process or "objects" supported by JDF are essential to any workflow. Each can be thought of as a process node. Before you transmit or execute a quote, the quote must have certain information (input resources) and the output resource is the fax, email, or letter that is delivered. JDF business objects include:

- Request for Quote
- Quote
- Purchase Order
- Order Confirmation

- Cancellation
- Refusal
- Order Status Request
- Order Status Response

- Proof Approval Request
- Proof Approval Response
- Invoice

The JDF node/resource model for job ticket information is highly flexible and adaptable. This same basic construct can be extended beyond a particular job to include other plant operations that influence the production line such as inventory management, material acceptance testing, maintenance, and so on … but something has to tie all of your *nodes* and *resources* together in order to automate your operations.

MIS — The Brains of the JDF Environment

Conceivably you could store each JDF job ticket in individual documents, or in XML parlance "document instances," and the data could flow with the job from one device to the next until the job is completed, but with a few exception that is highly unlikely, terribly complex, and likely to be an information engineering nightmare. A JDF environment must have a command and control component, which JDF refers to as the "MIS system." This is not to be confused with your corporate management information system. A JDF MIS system may be a JDF-enabled workflow system or production management system, and it could be an integrated system comprised of many different software and database systems; however, a JDF MIS system should be able to:

- Decompose JDF document instances and store information into a database or data store,
- Compose JDF from its database or data store,
- Read and validate JDF,
- Write and validate JDF,
- Be aware of the input and parameter requirements of production devices on the plant floor,
- Understand, read and write validated JMF (*more on that below*.)

There are many additions services and functions a JDF-enabled MIS system may provide including:

- Being able to accept and manage extensions to JDF that are provided by other suppliers of JDF-enabled products. Extensions allow JDF users and technology providers to add unique XML elements and attributes to the JDF schema that are required for their product's functionality, but which are not part of the JDF specification,
- Allowing users to create JDF extensions for data requirements that are unique to their company, market or customers,
- Providing JDF workflow options, such as facilitating pipeline creation where two or more software functions or JDF devices are combined to act as one,
- Providing conversion tools and middleware for dealing with non-JDF software and systems, and
- Traditional production and MIS functions, including:
    - Estimating support or links to estimating systems,
    - Customer relationship management support or links to estimating systems,
    - Production scheduling,
    - Providing links to inventory management systems,
    - Providing periodic and ad hoc management reporting, and
    - Providing links to the company's financial systems, such as cost accounting and invoicing.

Many of the above "traditional productions and MIS functions" may be handled by one system, or by a combination of new JDF-enabled systems and legacy systems integrated with each other to create a JDF environment. There is no *right* answer to what your JDF MIS system should do directly and what should be left to other systems — much will depend on your market, customer group, legacy systems, need for customization, and so on.

JMF — *The* New Language of Print

Although many would argue that the primary benefit of JDF is the elimination of redundant data entry and the minimization of administrative time and labor, others would argue that JDF's real value is plant automation and increase workflow flexibility, but that cannot be delivered by a detailed job ticket and a smart MIS system alone.

An increasing number of devices on the plant floor have electronic controllers, a software interface, or are in fact software applications running on general computing devices. Each of these devices has its own interface, and if it is designed to be part the larger plant workflow, a controller language. Current controller languages are proprietary, and even if the manufacturer freely provides documentation, they are not *open* in the spirit of the word. The JDF schema has a *schema within the schema* call JMF or the *Job Messaging Format.* JMF is an XML-based controller language and it's the third (and most important) pillar of the JDF environment.

Technology providers and users both win with JDF. Because it is extensible, it can be adapted as technology improves, but more importantly, in means that plant engineers and technology developers only need to learn one controller language. This means that technology providers will save on the cost of supporting multiple generations of their own equipment, and users will save on the high cost of integrating systems from multiple vendors into an automated plant environment. JMF allows:

- The JMF controller to "register" with the JDF-enabled MIS system, so that the MIS system knows what is available to it,

- The JMF controller to report information about the devices it supports to the JDF MIS system,

- The JMF controller to report events, status, and results (or responses) to the JDF MIS system, including the phase a job is in, counts, employee working the device, waste, and so on,

- The JMF controller and JDF MIS system to exchange messages,

- The MIS system to communicate signals, commands and queries to JMF devices,

- One JMF controller to communicate to another,

- The JMF controller to communicate signals and queries to a resource pool (For example, an ink well or paper spooler),

- Both the JMF controller and MIS system to share common job tracking identifiers,

- Allow the JDF MIS system to manage the controller/device's job queue,

- Allow the JMF controller and MIS system to establish a method for communicating with each other and to submit jobs. (These include file submission, the use of hot folders, Hyper Text Transmission Protocol (HTTP), and Multipurpose Internet Mail Extensions (MIME).

Not every JMF device will support all of the above features; in fact there are five levels of JMF (see *Where Should Users Start* below) and some devices may not support JDF at all. One JDF technology provider has a great approach; rather than retrofitting their equipment or replacing controllers, their approach is to provide a full-function JMF controller that is a stand-alone device which creates a bridge between the JDF MIS system and other non-JDF devices produced by the manufacturer. In the hypothetical JDF environment below, the postpress department has a single controller that communicates with the JDF-enabled MIS system via JMF, but then

communicates to existing postpress equipment through their legacy controllers and in the controller language that they already understand.

JDF Environment with a JMF Controller bridging MIS and Legacy Postpress
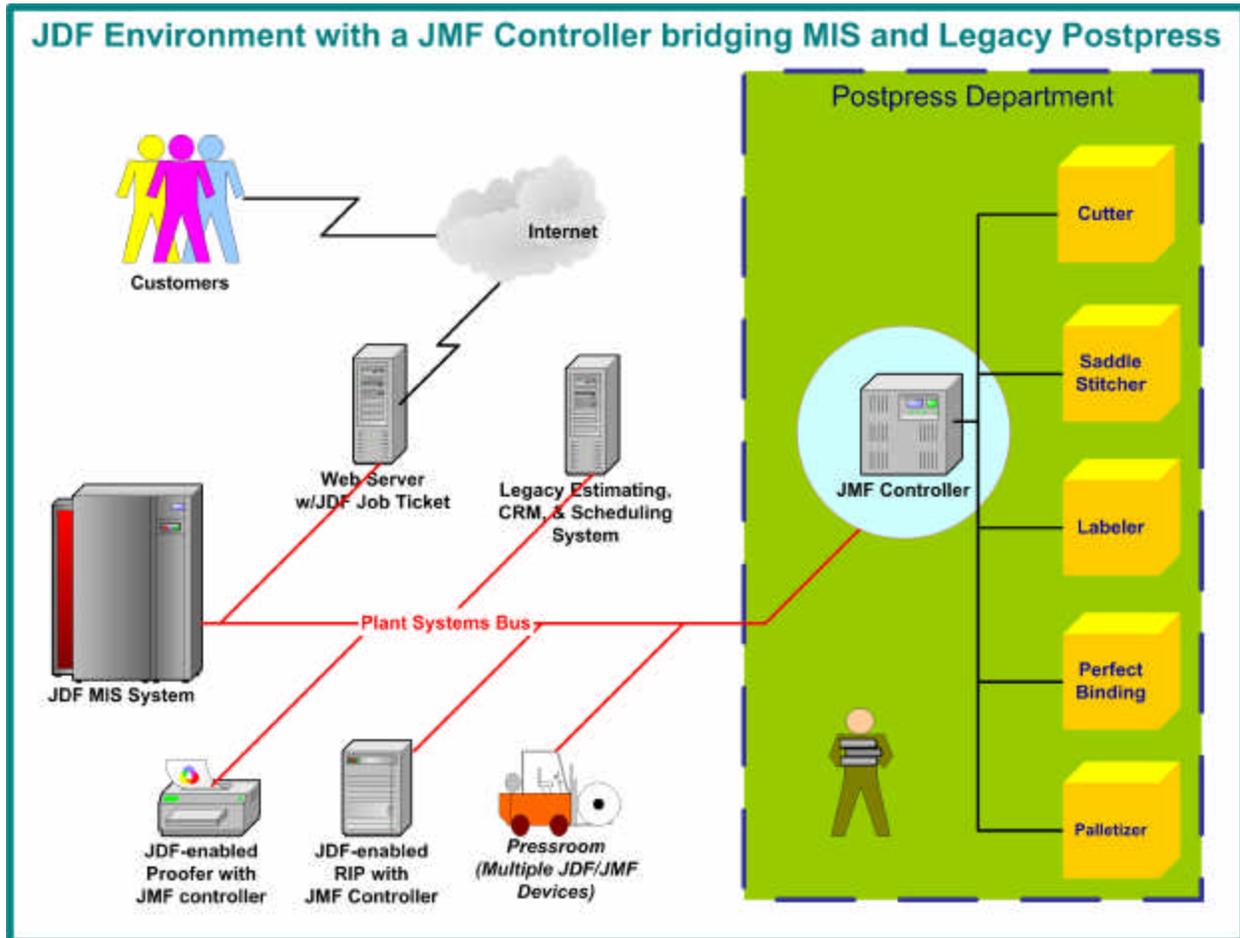
Issues to Watch Out For …

- Be aware of what parsers are incorporated into your various JDF-Enabled systems. Parsers read the rules established by the JDF schema (or your derivative of it) and validate that document instances conform to those rules. Parsers will run in the background to provide functions such as:

    o Facilitating the conversion and decomposition/composition of JDF data into and out of databases residing in MIS systems and workflow systems,

    o Checking JMF transactions at controllers or MIS systems,

    o Supporting the creation of JDF job ticket information in preflight utilities, web software, and front and systems, and

    o Providing JDF systems checks, including troubleshooting.

  Not all parsers perform equally well at all tasks and you may find that difficult to explain and "mystery" problems between two different devices or systems stem from the fact that they incorporate different parsers.

- An XML Schema parser may be able to validate that your JDF or JMF document instance is valid XML and conforms to the JDF specification, *but it will not ensure that the job makes sense!* Additional logic on behalf of the MIS system or software that you select must help reinforce good printing. JDF will not tell you that case binding a 16 page book is not a good idea, which leads us to …

- JDF will not eliminate human error. There is an old saying; *computers allow us to make the same mistakes faster and in greater quantities.* As you implement a JDF systems or production environment, be sure to keep track of your old quality assurance measures and know how they will be either automated or improved as you go forward, but make sure they are not accidentally dropped!

- Not all JDF systems will be equal (see the previous two bullets). JDF provides a common exchange language that can save technology providers and users a lot of money in time, training, and maintenance of integrated systems; but it is a common basis from which technology vendors will compete with feature, function, proficiency, and price. Odds are you will encounter JDF-enabled systems and software that employ ***JDF extensions***. JDF extensions are XML elements and attributes that are unique to that vendor's products. This isn't a bad thing, in fact, it's necessary, but beware:[3]

  - Users should be able to get a modified JDF schema and documentation from vendors that use extensions, so that they can ensure other systems can use the extension appropriately (if need be.)

  - Processors that are not "aware" of the extensions should ignore (pass through) extensions; however, this is a potential source of errors and should be tested and checked thoroughly.

  - If your MIS system or other software validates the completeness of a job, or schedules the use of JDF processes or resources, it probably needs to be able to understand the extensions. Essential job information that is contained in extensions may cause a job to be "incomplete" if other JDF job control or workflow system cannot process those extensions. In other words, improperly implemented extensions may cause jobs to get stuck in a queue somewhere in your workflow.

- Printers and other JDF users may also want to employ JDF Extension of their own, or may look for MIS systems that allow them to tailor their JDF-enabled MIS systems to their workflow and data requirements; hence, users should ask the question: does your system allow users to create JDF extensions? For example, a printer that specializes in book printing may organize jobs with Digital Object Identifiers, library card data, and by their client publishers imprints. A newspaper is likely to organize by editions, sections and regions. Printer that supports magazines may have advertising codes and bindery codes that are unique to a client publisher.

  These are a couple of examples of where users may wish to employ their own JDF extensions, but in real life the application of user created extensions are as likely to be as

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[3] JDF 1.1 encourages JDF technology providers to submit their JDF extensions to CIP4 for possible inclusion in future versions of the specification. CIP4 is also contemplating future requirements for either registering extensions to submitting them for review to ensure that they don't create conflicts and redundancies with the JDF specification.

numerous as there are variations in workflow and client communications today. From an application's point of view, this need not mean that JDF users become XML experts. JDF technology providers are likely to provide a simple interface that allows a degree of user customization of the MIS system and "underneath" the functional schema is modified accordingly for validating transaction in and out of the system; however, all of the cautions provided above on extensions provided by JDF technology providers also apply to user created JDF extensions.

- Avoid one-way software, particularly MIS systems. Although some software, such a preflight tool that generates a JDF ticket from art file metadata and user input, are inherently points of origin for JDF, in most case you'll want to be sure that your JDF software and MIS systems can both import and export validated JDF document instances. An MIS system that can only read JDF or can only write JDF is a proprietary, closed system maneuver — either closed to backend integration of other provider's systems and software or closed to front-end JDF systems integration respectively.

Where Should Users Start?

Few printers will open a new shop and fill it with JDF-enabled systems and software at once. Odds are users will implement JDF over-time as equipment is replaced as normally scheduled. Of course there may be legacy systems that can be upgraded or retrofitted with JDF/JMF enabled controllers, as opposed to outright replacement. But before purchasing JDF-enabled software, there a few things that users may want to do:

- *Make someone responsible.* Designate a team of folks on staff with the time and responsibility to "get smart" on JDF, Schema, and XML data processing. JDF combines two areas of technology, graphic arts and XML, and there are few people with both. Only a couple of industry consultants span these areas and they are not likely to come cheap. Several of the technology providers have dedicated large staffs to their JDF development activities (and even they had to hire outside of the graphic arts in many cases, or build expertise internally), but initially they are not likely to have the depth necessary to provide in-depth training and customization to every customer. By the time JDF becomes less a neologism of the day and more the lingua franca of the graphic arts, the laggards, technology providers and users alike, will find themselves at an inexorable competitive disadvantage.

- *Pick a path.* Is there a plant or production line that is due for replacement or upgrading that would be good first implementation for JDF at your company? Is there a particular customer or market segment that you serve that would be well suited for JDF, and is it the automation or the streamlining of production that would be of greatest value? For instance, a weekly magazine or daily newspaper may be more motivated by the benefits of streamlining, while a customer of a printer serving the packaging market may be more attracted by the benefits of automation, such as allowing them a greater ability to directly control the customization packaging for promotional events. The same is true for technology providers — they will want to create JDF products first where the immediate impact and need is greatest.

- *Document your current environment.* A quick printer or copy shop is likely to have little in the way of customized systems, (with the possible exception of those that have made the move to digital printing), but commercial printers serving market niches probably have at least a few customized systems in place. Document your environment formally,

to include creating data models of your systems and information flows and collecting data dictionaries of the information elements you presently use. Having this information will help you to determine what JDF can and cannot do for you "off the shelf," and will help you determine if you will need to create JDF extensions for your own shop or product line. Again, the same is true for technology providers — knowing to what extent they will need to create JDF extensions will be critical to their product development budgets and development schedules.

- *Be prepared to test.* Technology providers know all about product testing, but users can also use benchmark-testing practices to buy smartly. Create a JDF schema derivative that fits your needs as determined above, and include the user extensions that you will need. Create a couple of hand-coded JDF document instances and use these and your JDF schema derivative to test candidate products and systems. In the late 80's early 90's the author used similar benchmarks to select SGML (Standard Generalized Markup Language — the parent language of XML) software and systems and even brought diskettes to tradeshows for on the spot evaluations. The document type definitions (sort of the SGML version of an XML schema) and document instances had deliberate errors and these benchmarks proved to be invaluable!

- *Bite off what you can chew.* Look for the JDF implementation that will provide the most immediate return on your investment and start there. Don't bother with a corporate automation program; *you will only create failed expectations*. Pick a test implementation, on a highly probable production line or customer group as discussed above, and get some production experience with JDF. The lessons you will learn will allow you to then create broader JDF implementation programs and objectives that are more realistic and grounded.

- *Determine your JMF level for purchasing and equipment selection.* Another thing to consider, for both users and JDF technology providers is to determine what their objective level of JMF support is. There are five levels of JMF support described in JDF 1.1. Furthermore, you should know how you would handle JMF devices that are of a lower level or higher level of support. The following are the levels of JMF support. I've added the numbers for clarity (e.g., they are not numbered in the JDF 1.1 specification.) It is assumed that the higher levels of support incorporate all lower levels of support, with the exception of JMF level 1.

  o **JMF Level 1 — No messaging**. These are devices that don't support JDF but have electronic controllers that provide response messages in their own format; and JDF includes audit records for such devices.

  o **JMF Level 2 — Notification.** JMF Level 2 devices that support notification provide unidirectional messages that inform the controller when they begin and complete execution of some process within a job, and may also provide notice of some error conditions.

  o **JMF Level 3 — Query support.** JMF Level 3 devices that support queries respond to requests from other devices by communicating status information such as job attributes or current job progress. Queries support requires bi-directional communication capabilities.

  o **JMF Level 4 — Command support**. JMF Level 4 devices have the ability to process commands. They can receive commands, for instance, to interrupt the current job, to restart a job, or to change the status of jobs in a queue.

- o **JMF Level 5 — Submission support.** JMF Level 5 devices controllers may accept JDF jobs via HTTP and must support MIME multipart documents.

- *ROI, ROI, and ROI.* Your return on investment is your guiding path, and each user will have to conduct a cost benefit analysis on a case-by case basis. Right now there is not enough JDF-enabled equipment on the market to determine the cost of total plant conversion, so you can expect to revisit your ROI determination periodically, if not continually. As the products on the market blossom and mature, the ROI picture will change and come into better focus. Below are a few of the cost-benefit factors to consider. Plan on revisiting each of these at least annually. (JDF technology providers should anticipate questions arising from these considerations):

  - o What is the market value of greater flexibility and time to press for your business?

  - o What is the current cost of plant integration, equipment interface training, and what would you save if your plant engineers basically had one device language to learn?

  - o How would JDF play into your supply chain management and maintenance programs?

  - o Are your clients looking for more direct input into production or are they demanding faster turn around times? What value do they put on these needs?

  - o How complex is your operations? The greater the number of systems on your plant(s) floor, the greater the value of instituting JMF in particular. In addition to the savings mentioned in the second bullet above, the ability to use JDF-enable systems to give you better management control over plant workflows is of value itself?

  - o What is your natural equipment replacement turnover: five years? Ten? Twenty? Will you need to accelerate investment new equipment in order to achieve your objective return on investment in JDF-enabled equipment?

  - o What will it cost to capture your unique workflow requirements and tailor a JDF environment to meet your needs? Do you need help from XML experts in order to create user JDF extensions? Are your systems, databases, and workflows well documented or do you have to do some reverse engineering to go about implementing JDF smartly?

  - o What are your technology providers' plans for providing JMF features with their equipment? Are they offering or planning on upgrades or retrofits, or are they pushing for product replacement?

  - o Where are the bottlenecks in your JDF implementations? (e.g., those areas where no JDF or JMF products are available or where customize legacy systems prove to be too costly to reengineer and replace?

  - o What is your competition doing? Consider both traditional competitors and new or outside competitors.

Which Companies are Introducing JDF Products?

There are over 120 member companies and organizations of CIP4, and over about 100 of them sell equipment, systems or software to the graphic arts industry. A few of them have said that they are just observing and are not *yet* planning to introduce JDF-enabled systems or software. A couple of significant companies, such as MAN Roland, Komori, and Müller Martini have been high-profile participants, but have *not* provided any information regarding their JDF product plans. There are, however, over 20 companies that have taken a leadership position and have either announced JDF-enabled products in development or, in some cases, have already made JDF-enable products available to the market. There are also a couple of companies that are not members of CIP4 that are developing JDF-enabled software, mostly PrintTalk applications. (See www.printtalk.com)

The following tables provide information on all known products that are on the market or that are in development. This information was collected either from the CIP4 website or through direct responses as a result of survey conducted for this article. (Please note that these tables are being provided to CIP4, at CIP4's request, and updates will be available on the CIP4 website following the initial publication of this article.)

For the purposes of this article we have included information on products that is discussed in this article, and we have used the JDF definition of "MIS system." As mentioned above, "MIS system" can have different meanings and some of the products in the JDF-enabled MIS systems table may be better termed "workflow software." These tables are intended to provide you with enough information to get you going, however, when you build or buy JDF-enabled equipment you'll want to know much more about the products. You may want to know is the systems can execute in serial, parallel, iteratively, or using pipes; if they can handle spawning and merging of sub-processes; how they use HTTP and MIME (also part of the specification) for device linking and message transfer; how they handle errors; and you'll want to know which of the 86 JDF processes (i.e., Creasing, Labeling, Rendering, Approval, etc.) and the over 150 JDF resources (i.e., TrimmingParams, ScreeningParams, Employee, etc.) they support, as well the extent to which they support each. The four tables cover the following types of products:

- *JDF Job Ticket Software* — Software or systems that writes and reads (no one way traffic devices, no MIS systems) and validates JDF job tickets,

- *JMF Enabled Software and Systems* — Devices (plant equipment, NOT MIS systems) that use JMF,

- *JDF-Enabled MIS Systems* — The part of a JDF workflow that oversees all processes and communication between system components and system control, and

- *JDF Development Tools* — Tools that help developers build JDF systems.

JDF Job Ticket Software

Brand	Name	Model	Function	Available today?	Platform(s)	JDF Extensions?	URL
Adobe	3015 PostScript RIP	--	RIP	Yes	--	--	www.adobe.com
Agfa	Delano		Acts as an interface between a print buyer and print provider	Spring 2003	Window 2000 server w/browser client	No	www.agfa.com
Heidelberg	HeiPort	n/a	HeiPort™, a new kind of e-portal, will allow print providers to communicate directly with print buyers through a designated Web site and will enable an array of e-services, from remote proofing and online requests for printing quotes and orders, to job management and secure file transfer.	Spring 2003	Mac, Windows	No	www.heidelberg.com/hq/eng/
Markzware, Inc.	MarkzNet		Preflight software	JDF version 2003 or 2004	Mac, Windows	Yes	www.markzware.com
Markzware, Inc.	MarkzScout		DAM Workflow	JDF version 2003 or 2004	Mac, Windows, Liniux/Unix	Yes	www.markzware.com
Markzware, Inc.	Hawkeye		Preflight software	JDF version 2003 or 2004	Mac, Windows	Yes	www.markzware.com
Markzware, Inc.	FlightCheck		Preflight software	JDF version 2003 or 2004	Mac, Windows	Yes	www.markzware.com
ppi Media GmbH	ProMan	n/a	Output Management System	2003	Any (Java based)	Yes	www.ppi.de
ppi Media GmbH	GlobalTrack	n/a	Tracking Software	Yes	Any (Java based)	Yes	www.ppi.de
ScenicSoft	Pandora		Imposition tool for packaging and label printers	Yes, but JDF output support pending	Mac, Windows	--	www.scenicsoft.com/Pandora/index.html
ScenicSoft	Preps		Imposition tool for commercial printers, includes JDF output.	Yes	Mac, Windows	--	www.scenicsoft.com/Preps/index.html
TripleArc	Collborative Workflow System		Workflow system with job ticket creation functions (See also MIS chart)	Yes	Web-based	Yes	www.triplearc.com
Vio	Vio Digital Workflow Application Suite	Version 4.0	Secure and reliable transmissions of folders and files over the Internet and private networks; Guaranteed delivery of files or folder sizes, with e-mail notification; Online management information, analysis and reports; Remote colour managed printing and proofing; Integration with Preflight tools; and JDF based workflow support.	August, 2002	Mac, Windows, Unix	Yes	www.vio.com
Xerox	Book-In-Time		Prints and finishes Perfect Bound books	Yes	TBD	No	www.xerox.com

JMF Enabled Software and Systems

Brand	Model/Name	Function	JMF Level (1-5)	Available today?	JDF Extensions?	URL
Agfa	ApogeeX	Workflow management application acts as the JMF dispatcher for all the devices connected to it. The devices themselfs are 'dumb' and do not know about JMF.	TBD	Spring 2003	No	graphics.agfa.com
Best GmbH	Best Colorproof, version 4.5.1	Color proofing / remote printing	--	--	--	www.bestcolor.com/bcde/produkte/uproof.htm
bielomatik Leuze GmbH	BoD Server	Acts as a bridge between MIS systems & bielomatik automated bindery equipment.	--	Summer 2003	No	www.bielomatik.de/index_e.html
Electronics for Imaging	Velocity Balance/Build/Scan/Estimate	Workflow software for digital printing	--	JDF Version planned		www.efi.com
Electronics for Imaging	Fiery System	Printing, color management, preflight, late editing, job management, etc	--	JDF Version planned		www.efi.com
Graphics Microsystems	CIP Interpreter/ColorQuick	Automatic web press color control system presetting	--	--	--	www.gmicolor.com/info.htm - color
Graphics Microsystems	CIP Interpreter/Microc olor	Ink key presetting	--	--	--	www.gmicolor.com/info.htm - micro
Graphics Microsystems	CIP Interpreter/PrintQuick	Automatic web press register control presetting	--	--	--	www.gmicolor.com/info.htm - preset
Heidelberg	AxisControl	Color measurement	--	JMF version by Drupa 2004	No	www.heidelberg.com
Heidelberg	FCS100 (consists of modules Compufold and Compustitch)	Connects Folders and Saddlestitchers to the workflow	--	JMF version by Drupa 2004	No	www.heidelberg.com
Heidelberg	Autoregister	Registration system	--	JMF version by Drupa 2004	No	www.heidelberg.com
Hewlett-Packard	HP remote proofing solution	Remote proofing	--	--	--	www.hp.com/
Horizon International Inc.	DigiFinish Book Integrity for Offline Booklets for Production Color Printers	Perfect Binding Automation	--	--	--	www.horizon.co.jp/home/index_e.html
Ink Planner	Esko-Graphics	Ink key presetting	--	--	--	www.esko-graphics.com/
Printcafe Software, Inc.	Auto-Count	Waste reduction systems	--	--	--	www.printcafe.com/solutionsforprinter/autocount/
Printcafe Software, Inc.	Elysium WebSystem	Waste reduction systems	--	--	--	www.printcafe.com/
Xerox	DigiFinish Book Integrity for Offline Perfect Binding for Production Printers	Perfect Binding Automation	5	Yes	Yes	www.xerox.com/
Xerox	DigiFinish Book Integrity for Xerox Manual+Book Factory	Perfect Binding Automation	5	Yes	Yes	www.xerox.com/

JDF-Enabled MIS Systems

Y=Yes
N=No
P=Planned
TBD=To be Determined

Brand	Model/Name	Estimating?	CRM?	Scheduling?	Inventory Control?	Management Reporting?	Financial Functions?	Workflow Management?	Does is read and write JDF?	Does it read and write JMF?	JMF Support Level 1-5?	Does it support pipelines?	JDF Extensions?	JDF Extension creation?	Available today?	Platform(s)?	URL
Agfa	Apogee Series3	N	Y	Y	N	N	N	Y	Y (read only)	N	N	N	N	N	Y	Window NT Server, w/Mac, PC	www.agfa.com/graphics/
Agfa	ApogeeX	N	Y	Y	N	N	N	Y	Y	2003	2003	TBD	TBD	TBD	Q4 2002	Window 2000 Server, w/Mac, PC	www.agfa.com/graphics/
Beijing Founder Electronic	ElecRoc v1.2	N	N	N	N	N	N	Y	Y	N	N	N	Y	N	Y (Chinese), English version 2003	Windows Server, Mac & Windows Client	www.elecroc.com
Fuji	Celebrant Extreme	--	--	--	--	--	--	Y	--	--	--	--	--	--	--	--	www.ffei.co.uk/pages/products/celebrant.html
Heidelberg	Prinance	--	--	--	--	Y	--	Y	--	--	--	--	--	--	Partial JDF late 2002/full JDF Drupa, 2004	--	www.heidelberg.com
herbert dahm datensysteme GmbH	dahm print + medien/hd-druckdialog	Y	Y	Y	Y	Y	Y	Y	2003	2003	1	N	N	N	2004	Windows, Linus/Unix	www.dahm.de
HIFLEX GmbH	Hiflex Print / Media / Crossmedia	Y	Y	Y	Y	Y	Y	Y	Y	Y	All	Y	Y	Y	December, 2002	Mac, Windows, Linux/Unix	www.hiflex.com
Optichrome	Optimus 2020	Y	Y	Y	Y	Y	3rd party interface	Y (planning & admin, not prepress)	Y	Future Version	TBD	N	N	N	Y (JMF support end of 2002)	Solaris, Linux, NT/Widows 2000 (w/ Windows and Browser clients)	www.optimus2020.com
Orga Soft	OS ABSYS/3.31.35	Y	Y	Y	Y	Y	Y	Y	P	P	P	Y	P	N	TBD	Windows	www.orgasoft.com
ppi Media GmbH	PrintNet	Y	N	Y	N	Y	N	Y	Y	Y	All	N	Y		2003	Any (Java based)	www.ppi.de
Printcafe	PrintCafé Hagen OA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	www.printcafe.com/solutionsforprinter/hagen/
Printcafe	PrintCafé Logic LMS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	www.printcafe.com/solutionsforprinter/logic/
Printcafe	PrintCafé Prograph	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	www.printcafe.com/solutionsforprinter/prograph/
Printcafe	PrintCafé PSI	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	www.printcafe.com/solutionsforprinter/psi/index.cfm
Printcafe	PrinterSite	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	www.printcage.com

Y=Yes N=No P=Planned TBD=To be Determined Brand	Model/Name	Estimating?	CRM?	Scheduling?	Inventory Control?	Management Reporting?	Financial Functions?	Workflow Management?	Does is read and write JDF?	Does it read and write JMF?	JMF Support Level 1-5?	Does it support pipelines?	JDF Extensions?	JDF Extension creation?	Available today?	Platform(s)?	URL
Schultz Grafisk	Navition Attain	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Screen	Trueflow Pro & Trueflow system	--	--	--	--	--	--	Y	--	--	--	--	--	--	--	--	www.screen.co.jp/index.html
ScenicSoft	UpFront 1.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	www.scenicsoft.com/products/UpFront/index.html
Tharstern Ltd	TharsternSQL	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	www.tharstern.com/
TripleArc	Collborative Workflow System	N	Y	Y	N	Y	Y	Y	Y	Y	N (Q4 2002)	N (Q4 2002)	Y	Y	Y	Web-based	www.triplearc.com

JDF Development Tools

Brand	Model/Name	Function	Available today?	Platform(s)?	Allows for vendor-specific extensions?	URL
Objective Advantage	JDF Development Platform (JDP)	Allows a developer to easily integrate JDF, JMF and PrintTalk into web, client/server and embedded applications. It includes the following key features: - Schema driven JDF parser that will also support current and future versions of JDF as well as JDF extensions - A JDF object model that allows programmatic access in logical component relationship order as well as JDF node order - A JDF storage engine that allows parsed JDF nodes to be stored in a relational database for easy access by off-the-shelf reporting and analysis tools - An event-driven workflow engine that understands and works with JDF jobs and can be driven by inbound JMF messages - JDF browsing/editing components - A web service component that supports JMF and SOAP transport mechanisms	4th quarter of 2002	.NET (Windows w/ Linux/Unix & Mac in development)	Yes	http://www.oai.cc
Adobe	Adobe PDF Transit	Enables print providers to develop streamlined, reliable, and secure Adobe PDF-based workflows that begin at their customers' desktops and extend across the Internet to the final output device. PDF Transit is a Software Development Kit (SDK) that includes a client builder tool and server components. Customers can easily create, submit, and digitally preview print jobs, while print providers can configure the client software to generate Adobe PDF files that match the capabilities of their own most complex output devices. This ensures that customers can access print services directly from their desktops to print content any time, any place, and from any device.	Yes	Windows 95, 98, me, NT 4.0, 2000, XP, MacOS 9.04 and higher, MacOSX Classic. Server is Windows 2000 Server.	"It is an SDK for the customer to configure."	http://www.adobe.com/products/pdftransit/main.html
Adobe	JDF Software Development Tool Version 1.05	Comprehensive C interfaces for creating, manipulating and consuming JDF, "High Level" RunList & Layout enumeration, sophisticated validation support, and detailed documentation and sample code.	Yes	Windows NT / 2000 pro / 9x / Me, MacOS 9.x (Classic), Solaris 2.6 (Sparc), RedHat Linux 6.2 (Intel)	"Software for customer to use as they wish"	http://www.adobe.com/products/extreme/jdf.html

Will JDF Stick?

The key question on everyone's mind is, Will JDF stick? No everyone is optimistic. David Watson's (Ultimate Technographics) reply to our survey is indicative of the cautious position that many suppliers of graphic arts equipment have taken. "Our software," said Watson, "is probably the only one that has a complete implementation of PPF and we have many users using it. We were however burned by this development. Basically we were all dressed up with nowhere to go. The manufacturers of equipment were very slow to adopt PPF interfaces to their equipment. So with JDF we held back to see how quickly it will develop."[4] Is it a *chicken and egg* situation? Will printers wait for the technology providers, who in turn will wait for a market to develop?

There will be many printers who will do nothing with JDF until it is widely available and the future of JDF becomes painfully obvious, and there are vendors who will be slow to adopt JDF. However, there are several prospective users, such as St. Joseph Printing, Japs-Olson, Toppan Printing, Standard Register, QuebcorWorld, RR Donnelley & Sons, Publishers Printing, and so on that are members of CIP4. More importantly, there are already printers, (and not necessarily members of CIP4), that are already working on alpha and beta JDF implementations in partnership with technology providers.

One such printer, Brown Printings' central imaging manager Scott Borhauer says, "The Job Definition Format supplies a means for printing businesses to streamline the process of producing printed material." According to Borhauer, "The most compelling attraction [of JDF] is the interchangeable file format to lend itself to the different areas of manufacturing. It starts with the customers tagging the file with XML data provided in a electronic job ticket, than it is interpreted by our front-end database, we the printer complete the triggers in the database that will allow the file to process through the automation of prepress, press, and bindery. Automation, Automation, Automation!!!!"

Although the list of JDF-enabled software and systems above is impressive, it only represents a fraction of the thousands of products on the market today. The greatest progress has been made in the JDF-enabled MIS systems category, but the JMF-enabled systems and software list is noticeably lacking. It's worth noting that Heidelberg is planning on moving its Prinect family of printing products to JDF. Although a few items are mentioned in the table above, other products that are scheduled to move to JDF by Drupa 2004 include:

- DataControl
- Jetbase
- SignaStation
- MetaDimension
- Delta Technology
- Prepressinterface
- CP2000 Center
- ImageControl
- Plate Image Reader

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[4] PPF is the Print Production Format, (the precursor to JDF), that was created by CIP3, (the precursor to CIP4.)

- Omnicon
- AutoRegister

Heidelberg's JDF program is likely to go unanswered by its competitors, many of who are actively involved in CIP4. Furthermore, for technology providers, adding JMF controllers to your equipment is a less expensive development endeavor as building entire JDF MIS systems. So both the *chickens* and the *eggs* are available today and more are on the way … *JDF will stick*.

Prologue

If your company embarks on a JDF implementation program, the author is interested in learning more about your developments, especially user case-studies and innovative JDF technology introductions. Feel free to contact Jim Harvey at Jharvey@media4theworld.com. If you have JDF-enabled software or systems on in development that are not listed in the above charts, please send your updates to Stefan Daun of Fraunhofer Institute for Computer Graphics (the CIP4 Secretariat) at Stefan.Daun@igd.fhg.de.

References:

- *JDF Specification Release 1.1*, International Cooperation for Integration of Processes in Prepress, Press and Postpress, http://www.cip4.org/, June 2002.
- *The Role of JDF for Heidelberg,* by Christian Anschütz, IPEX 2002 (presentation slides).
- *Products that are planning or using JDF,* CIP4 Association, www.cip4.org, June 7, 2002.
- *Webopedia: Online Dictionary for Computer and Internet Terms,* Internet.com, http://www.webopedia.com/, July 27, 2002.

About the Author

James E. Harvey is the founder and President of Media4theWorld, LLC, which provides management and technical consulting to the media industries. Media4theWorld is also responsible for the edit and production of version 1.1 of the Job Definition Format specification. Prior to Media4theWorld he was Vice President of Spectrum Operations at Graphic Communications Association (now IDEAlliance), a technical and management association for the print and Internet publishing industries, and prior to that he was a Business Development Manager at Volt Information Sciences where he organized and pioneered document and data warehousing, SGML services and applications, early on-line and worldwide web implementations, CD-ROM publishing, hypermedia, and object-oriented document constructs. Jim has authored or co-authored several key industry documents, including SWOP 8th Edition, CGATS.12 PDF/X1, GRACoL, and has published numerous articles on the use of SGML and XML dating back to 1993.