JDF-A Dynamic Leap Forward

BY HARRY WALDMAN

IMAGINE, FOR A MOMENT, that Johann Gutenberg took a walk through a modern print shop. Think about his bewilderment as he saw no evidence of type as he knew it, strange looking printing presses filling skid after skid with printed sheets in glorious color and binding equipment rapidly spitting out books. To say the least, it would be a tour filled with awe and amazement. Perhaps most of all he would wonder why so many people were transfixed by those shimmering boxes—for him, computers and LCD displays would be quite a perplexing innovation.

Everything would be so different, he wouldn't recognize a thing. But wait a minute! He's spied something very familiar, and now you can almost hear him shouting for joy: "It's a job jacket!" And he thinks it was written by that same guy he employed back in the 1450s, complete with illegible handwriting and food stains that obliterated the entry for quantity.

OK, I took quite a bit of creative license to make my point. Some shops already use a digital job ticket system, thereby eliminating at least the manual write-up and perhaps replacing the physical job jacket itself. A few have gone a step further and are communicating and gathering information throughout the process.

Nevertheless, acquiring and distributing accurate information through a variety of computerized and manual methods remains a clumsy and costly process as tying it all together has been elusive. The different processes and equipment produced by various vendors could be likened to independent islands in the (data) stream. This remains true even for the more advanced printers with sophisticated information systems, since these systems are still proprietary.

Different Languages

Communications in a printing plant are like the Tower of Babel. The prepress system speaks one language, the pressroom has individual presses speaking in the dialects of their manufacturers, accounting speaks something different altogether and so on. Since the mid-'90s, some solutions to these challenges have been developed. Specification formats have moved the industry forward in its attempt to auto-
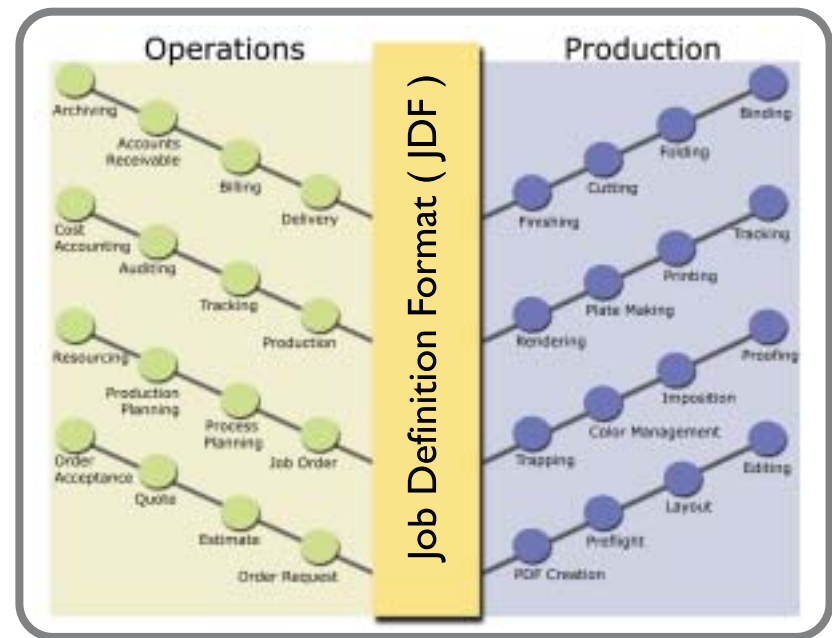
JDF, an XML-based file format/proposed industry standard, will soon become the critical foundation for the printing industry's shift to computer-integrated manufacturing.

mate the imparting and collecting of information, as well as actually controlling the workflow process. Although not yet perfect, shops that have implemented these advances are far better off than those still in the hunt for that lost job jacket.

Despite these advances, more was needed.

But before we get into what was missing, let's look at why it's still needed. The need to streamline and automate the print workflow so that it's faster and more cost-effective has never been more imperative. Fast, affordable and very efficient, electronic media is the greatest challenge print has faced since Gutenberg's day.

Not enough printers are as cognizant of the threat as they should be. But, most are aware of the trend toward shorter run lengths and faster turnaround. In fact, the majority of printers sampled in a recent TrendWatch survey reported that they were looking toward automated PDF workflow solutions to help them compete more

A JDF Definition From CIP4's Website

JDF is a comprehensive, XML-based file format/proposed industry standard for end-to-end job ticket specifications combined with a message description standard and message interchange protocol.

■ JDF is designed to streamline information exchange between different applications and systems.

■ JDF is intended to enable the entire industry, including media, design, graphic arts, on-demand and e-commerce companies, to implement and work with individual workflow solutions.

■ JDF will allow integration of heterogeneous products from diverse vendors to seamless workflow solutions.

Basic idea upon which JDF is based: To develop an open, extensible, XML-based job ticket standard, as well as a mechanism that provides new business opportunities for all individuals and companies involved in the process of creating, managing and producing published documents in the new economy.

Building on existing technologies of CIP3's PPF and Adobe's PJTF, the Job Definition Format supplies a means for printing businesses to streamline the process of producing printed material.

The most prominent features of JDF are:

1 Ability to carry a print job from genesis through completion. This includes a detailed description of the creative, prepress, press, postpress and delivery processes.

2 Ability to bridge the communication gap between production and management information systems. This ability enables instantaneous job and device tracking, as well as detailed pre- and post-calculation of jobs in the graphic arts.

3 Ability to bridge the gap between the customer's view of product and the manufacturing process by defining a process-independent product view, as well as a process-dependent production view of a print job.

4 Ability to define and track any user-defined workflow without constraints on the supported workflow models. This includes serial, parallel, overlapping and iterative processing in arbitrary combinations and over distributed locations.

5 Ability to do so (1, 2, 3 and 4) under nearly any precondition.

The following items aim to give you a clue what JDF is and how JDF-based workflow solutions can help to be more productive and more flexible:

■ JDF is not an application or product that you can purchase, but is a data format. The new Job Definition Format will play a significant role in future fully automated workflow solutions and will be the basis of such systems which have to be developed by the vendors.

■ JDF is compatible to the PPF (Print Production Format) and PJTF (Portable Job Ticket Format) by Adobe and it also supports job tracking functionality of IfraTrack. Therefore, JDF

effectively in this new environment.

The most progressive printers are going a step further by effectively utilizing the Internet for automated job submission that starts with their customers using tools like PDF Transit.

Even so, unless you have effectively packaged automated job submission with an automated production process, the goal of achieving maximum efficiency will remain elusive. And that's only a halfway measure. To go the whole way, you need to also automate the process of gathering, reporting and controlling data. Only by doing both can you achieve true cost efficiency and speed.

Finding Solutions

What was needed was a non-proprietary solution that could communicate with every device and all systems in the workflow. A solution that could impart information, gather information, and actually control and move a job through the entire production process—from the customer's desktop through delivery. In overly simplistic terms, you may have received that perfectly produced, production-ready PDF, but if you don't know what to do with it you are losing time calling your client for information and probably racing around the shop trying to answer questions.

In an ideal world, what you really want is for the job to

arrive from your customer as that perfectly produced PDF, complete with all of the job specifications. You want the specs to be automatically compared with the estimate. You don't want to rewrite the ticket; you just want to add the shop's production essentials and then send that PDF through the plant with each department getting needed information.

You want information accumulated in prepress to set the ink fountains on-press. You want to gather costing information automatically, which both accounting and production can easily use. You want to be able to instantly see what stage a job is at, perhaps even allowing the customer to track the job over the Internet—of course, the old "It's on the truck" story would no longer fly. I could go on, but you get the idea.

For this to happen, you have to be able to communicate with each device using one voice. A friend of mine, James Mauro, product manager for Heidelberg's Prinect Press Products, has come up with a very good analogy: Suppose you purchased an entertainment center—a television, DVD player, FM tuner and so on—all from a single manufacturer like Sony. Chances are, one remote would control all components in the system.

However, most of us have

assembled components from different manufacturers. So we have a coffee table littered with 20 remotes, and spend all too much time trying to figure out which remote controls which

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device. Fortunately, many of us have eliminated "clicker clutter" with a universal remote that can be programmed to control each device, regardless of the brand.

Now wouldn't it be nice if we printers had a similarly simple vehicle for communicating with all of our devices and processes? Unfortunately, for us the logistics are far more complicated. And in order to make this concept work, it must be a non-proprietary solution. Otherwise it would meet certain defeat.

Why? Well just imagine the chaos if Internet Explorer and Netscape each had their own language. The Internet works because it speaks with one voice: HTML, a non-proprietary, universal language available to all. This non-proprietary, singular voice was what print needed to develop a truly effective system that could speak to all islands of automation in the stream. A singular voice that

could attach itself to job file formats and ride with them.

The answer was XML (Extensible Mark-up Language). XML is not an HTML replacement. It is a cross-platform, software- and hardware-independent tool for transmitting information. In other words, XML was created to structure, store and send information in an open environment.

You may already be familiar with XML tags that can be placed in applications such as Adobe InDesign or in a PDF to designate what is a headline, subhead and so on, so that if the document is displayed on a different device, like a PDA, it will display properly. Like HTML, XML is there for all to use since it's non-proprietary. Thus, XML was the ideal building block for the task...and four companies recognized its value.

Adobe, Agfa, Heidelberg and MAN Roland—four of the most prominent companies in our industry—combined their resources to develop the Job Definition Format (JDF) based on XML. However, it didn't come out of a vacuum, as there was some solid groundwork that provided a foundation.

Adobe had already developed the Portable Job Ticket Format (PJTF). PJTF described the parameters of key prepress functions, such as layout, imposition, trapping and RIPing, and

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makes investments in today's PPF- and PJTF-based solutions safe.

■ JDF provides a flexible adjustment to almost every customer workflow. The reason for this capability is that JDF has got a very powerful internal tree-like structure of information and that JDF is encoded in XML (http://www.w3.org/TR/REC-xml), a standard controlled by the World Wide Web Consortium (W3C).

■ JDF is highly extensible with respect to future requirements. Features of XML (http://www.w3.org/TR/REC-xml-names) have been chosen to allow easy extension of the specification to support processes and devices not anticipated in version 1.0 of the specification.

■ JDF supports a continuous production control.

• Branching and merging of partial orders facilitate an automated production workflow at multiple sites and a cooperation of different partners like printers and prepress service providers.

• Preset values may be generated or entered by Management Information Systems or by prepress devices and be routed to subsequent production systems. This will allow signifi-

cantly reduced setup times of expensive press and finishing equipment.

• JDF also supports color management for high quality printing demands.

• Eventually future Management Information Systems will benefit from JDF's scheduling and production planning capabilities.

■ JDF facilitates job costing and job monitoring for a full transparency of production.

• Both planned and actual production times and operating data are reported to the Management Information System for job costing purposes.

• JDF will also let you know what material has been consumed or used by the various production steps.

• Eventually the Job Messaging Format (JMF) will help to monitor the complete workflow and to track all jobs in real-time. It supports the exchange of dynamic data like device-related information, status and progress messages, and queue management.

■ JDF supports quoting and ordering of jobs via Internet-based solutions and e-business applications.

• An abstract modeling of product intents is supported in order to allow print buyers to submit requests for quotes via a dialog on a Web page.

• Fuzzy customer requirements can also be submitted that may describe ranges of possible values for certain production relevant parameters.

• Of course, JDF does also contain the required customer data and information about the destination of the product delivery.

■ JDF is a vendor-independent standard.

JDF will become a widely adopted industry standard. While the first version of JDF was being developed by four initiating companies, it was agreed to pass the intellectual property rights on that specification to the CIP4 consortium. This will ensure that all vendors can develop systems that use JDF, and that no vendor is disadvantaged with respect to any of its competitors.

Additionally, CIP4 aims to involve even the users of future workflow systems for definition of new and close-to-practice features of the new data format.

For more information, go to www.cip4.org.

it provided some control over a variety of press activities. In addition, the forerunner to CIP4, CIP3, developed the Print Production Format (PPF). The purpose of PPF was to break through the machine language barrier and enable one job ticket to control devices manufactured by different vendors.

But let's pause a minute, seeing that another very important acronym has entered the picture: CIP4.

The acronym CIP4 doesn't stand for the four companies mentioned above. It is a totally independent organization established for the benefit of the entire industry. The International Cooperation for the Inte-

Heidelberg's Prinect software system will be fully JDF compliant by DRUPA 2004, providing control over users' prepress, traditional offset and digital printing, as well as postpress operations.

gration of Processes in Prepress, Press and Postpress is an international operating standards body located in Switzerland. I guess we should be grateful for the acronym CIP4, rather than ICIPPPP.

The purpose of the organization is to encourage computer-based integration of all processes that have to be considered in the graphic arts industry, with the intent of establishing standards. CIP4 is the successor of CIP3, which was started in 1995 as a joint initiative of several parties in the graphic arts industry.

The four companies (Adobe, Agfa, Heidelberg and MAN Roland) realized that for JDF to work as intended, it couldn't be their exclusive property; that would create a counterproductive, proprietary situation. CIP4 was the ideal organization to ensure that all would be able to capitalize on

the critically important benefits of JDF and guide it to become a truly universal format. So hats off to the four companies for their contribution and then giving it freely to all through CIP4.

And I salute CIP4 for its role as a conduit for JDF information, distribution and continued development. Plus I would encourage everyone in the industry—vendors, printers and content creators—to visit CIP4 on the Web at www.CIP4.org. There you will find a wealth of information on JDF, programs, seminars and membership.

Now that we know the who and the why, let's get into the what. And speaking of CIP4, if

you want to get it right from the horse's mouth see the sidebar that explains JDF as defined by the CIP4 organization. If you want my overly simplistic explanation, read on.

Info Piggyback Ride

We now know that JDF is based on XML, although it's a very special form of XML. XML is an information carrier that is non-proprietary and can attach itself to other files and devices. This means that if you create a job in a file format that is JDF-compliant, you can add information that will piggyback with the job in the same file.

Information can be collected both manually and automatically. For example, if you created a job in your favorite JDF-compliant desktop publishing program, details like page size and number of pages are already known and can be incorporated into the JDF file

automatically. Other information, like quantity and delivery details, would have to be entered manually.

The file can also interact with devices if they are JDF-compliant. For example, it really can capture those color settings on its trip through prepress and automatically set the ink fountains on the press. It can report back any job information to your accounting department, provided that your MIS system is JDF-compliant. It can let you know exactly where it is in the job cycle, with the option of reporting this information directly to your customer. So, as this file is whizzing through the shop, it's collecting and dispersing information. Plus it's controlling equipment. It does this by organizing the information around "nodes."

On the CIP4 Website there is a white paper that has a clear description of the JDF mechanism and how nodes function. Because it's so well done, that particular section is reproduced here. But this is just one part of a well-written white paper that details the whole process. Since this topic is going to become a vital component of our industry, I would encourage you to visit the site and read the entire white paper.

"JDF provides a mechanism to control all of the processes in print production. Unlike other job ticket formats, JDF allows the description of all the processes needed to complete a print product, from job submission through prepress, press and postpress. It does this by translating each process step in a job into what is called a node. The entire job is represented by a tree of these nodes. All of the nodes taken together describe the desired printed product and the workflow of its production.

"Each individual node— that is, each process—is defined in terms of inputs and outputs. The inputs for a process consist of the resources it uses and the parameters that control it. Inputs in a node describing the process for creating the cover of a

brochure, for example, might include the inks, the press sheets, the plates and a set of parameters that indicate how

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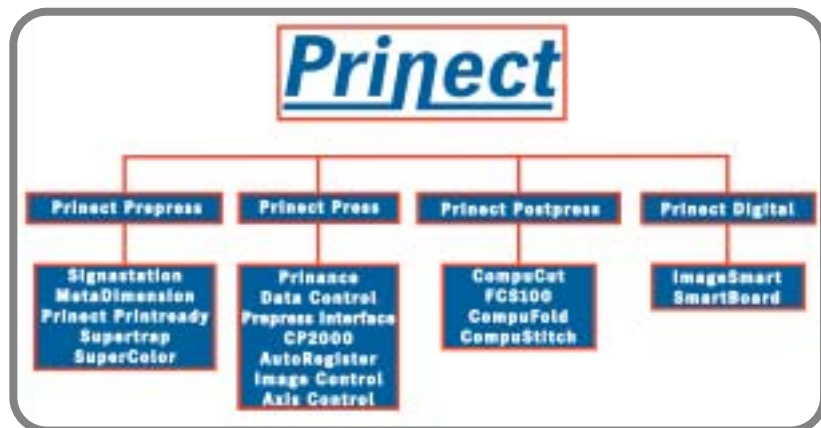
many sheets should be produced.

Process Nodes

"The output of the process node using these particular inputs will be a set of printed press sheets. Resources produced by one process, however, are modified or consumed by subsequent processes. Therefore, the output described above—the printed sheets— become the input resource for some set of finishing operations, such as folding and cutting. And the finished sheets that are the output of those operations become the input resource for further postpress processes—binding, for example.

"So the entire job is defined as a hierarchical network of processes that are linked through the consumption of inputs and production of outputs, which in turn become the inputs for further processing. The end result is the combination of outputs that produce the desired finished product. JDF provides the ability to place individual actions into a greater context, so that each element is regarded by the structure as a part of the whole."

If you're starting to grasp the possibilities of JDF, your whole body has to be quivering with excitement. OK, maybe you're just tapping your finger. But the printing industry truly is on the threshold of a great leap forward that can help meet the challenges of electronic media. Let me paint a JDF scenario that could be realized in the very near future.

Your client creates an 8½x11″, 16-page, four-color

brochure with two spot colors in a popular page layout program like Adobe InDesign. Those details, because they are part of the file, would be automatically picked up by JDF. Other details—like quantity, paper, delivery and so forth—would be entered by the client in a simple, standardized dialog box.

Web-Based Services

That information could be conveyed to your estimating department automatically over the Internet. All of the client details would be automatically entered into the JDF-compliant estimating program. The estimator would enter all of the production details necessary to estimate the job—some automatically and some manually captured. All of the production information would be stored in the printer's system. The estimate would be sent back to the client. The customer then decides to print the job with your company and uses a Web submission system like Adobe PDF Transit.

The printer gets a PDF that is perfectly made for its workflow. Plus the file carries JDF client job information that can be used for automatic comparison with the estimate. If it matches up, all of the production information can now be included and a job ticket automatically created. Additionally, the JDF-compliant MIS system is notified so that costs can be automatically tracked. Of course, manual intervention is possible at any phase and these changes become part of the file.

As the job travels through the shop, it can accumulate and report costs and progress, all automatically. Plus it can actually activate devices and processes on its trip. For example, it can notify the warehouse as to what paper is needed and when and where it is needed. It can automatically go through prepress, accumulating color parameters so that it can set ink fountains and simplify make-ready on-press. It can prepare the delivery papers and per-
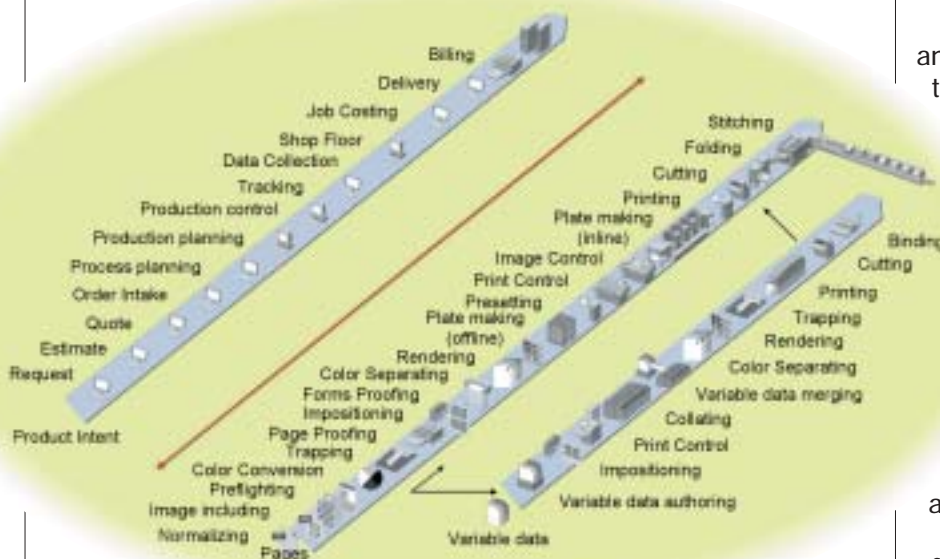
JDF provides a mechanism to control all of the processes in print production, from job submission through prepress, press and postpress.

haps notify FedEx via e-mail for a pick-up. Interacting with your JDF-compliant MIS system, it can automate preparation and sending of the invoice.

And, someday soon, it will carry a digital version of the signed proof together with the signed press sheet, ending the last known reason for the existence of the job jacket.

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If you were in the industry in the mid to late '80s, you should vividly recall the desktop publishing (DTP) revolution. You heard about DTP. They kept talking about it. But you didn't wake up the next morning and discover that mechanicals were gone, typographers had vanished overnight and all files were digital. It was like a train that was gaining momentum. Those that took it very seriously from the beginning understood where that train was going and knew that it would get there, even though no precise timetable was available. They got on, got involved and were prepared as the train traveled into new territory. Those that didn't get involved missed the train and were left at the station. Many are now out of business

because eventually mechanicals did disappear, typographers that didn't offer new services were no longer needed and all files became digital.

The train for JDF is starting to board; progressive companies are incorporating JDF compliancy into their products. Like desktop publishing, the timetable is not certain. We do know that there will be major station stops along the way. DRUPA 2004, for example, promises to be a showcase for JDF with many companies unveiling their new JDF-compliant wonders.

But how do you get aboard that train today? First, learn all that you can about JDF. Read, go to seminars and question industry suppliers. Next, start working on a plan for your organization as to how JDF fits into your future. Remember, a key objective should be automating both your workflow and your information and process control. And I would be very cautious about buying anything—whether it's a new printing press or the latest MIS system—without considering JDF compliancy.

I would also give particular attention to those that are leading the charge. CIP4, as mentioned, is an independent organization serving the industry. Obviously, the four companies that helped get this going most certainly would be in the lead

and deserve close observations. Heidelberg, for instance, has released Prinect, which is a fully JDF-based software system for prepress. Many Heidelberg products currently available already incorporate various Prinect-based components. All Heidelberg components will be Prinect enabled, and therefore JDF compliant, by DRUPA 2004.

Adobe's PDF Transit also affords an easy solution for your customer to create and submit a PDF over the Web that is made to your shop specifications. It is JDF compliant, as well, leading to true automation in every sense. That's just what you will need to survive in this business...true automation in every sense.

The time to look, learn and get going is now. The time to plan your future is now. And JDF, similar to the desktop publishing revolution of the late '80s, will take a major role in tomorrow's printing company because JDF means total automaton of the information and control processes. At the very least, like the Gutenberg Bible, the venerable old job jacket belongs in a museum, not on your shop floor.

About the Author
Harry Waldman is a consultant and an industry expert who has been in printing for more than 30 years. As a former company owner, he was well-known for implementing cutting-edge technologies. Waldman has also authored a book published by GATF. He is in PIA's honor society and has been honored by various industry groups on numerous occasions. He can be reached by e-mail at harry@harry-waldman.com.

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