

The JDF Revolution: An Educational Guide To JDF

JDF – Job Definition Format – is without question the most significant and viable integration initiative targeting print connectivity today.

The road to realizing benefits from JDF integration has been a long one, with many milestones along the way. At Drupa and GraphExpo 2004, we are seeing many exciting products and technologies that offer new levels of integration and performance in the ultimate quest for print automation.

The JDF Idea

JDF is an open standard job ticketing language that provides the foundation for customers to build next-generation printing environments that encompass both the content and the business aspects of production workflow. The Job Definition Format is a comprehensive XML-based file format for end-to-end job ticket specifications combined with a message description standard and message interchange protocol.

JDF was created to develop an open, extensible, XML-based job ticket standard, as well as a mechanism to provide new business opportunities for all individuals and companies involved in the process of creating, managing and producing published documents.

Building on existing technologies such as the Print Production Format (PPF) developed by the CIP4 and Adobe's Portable Job Ticket Format (PJTF), JDF supplies a means for printing businesses to streamline the process of producing printed material.



The JDF Revolution



The three most prominent features of JDF are its ability to carry a print job from concept through completion, its ability to bridge the communication gap between production and management information systems and its ability to do so under nearly any precondition.

In the last few years, the demand for greater unification of mechanized and automated systems has led to the advent of specification formats. These formats spawned a generation of systems in the mid-1990's that began to provide the ability to link certain elements of the prepress, press, and post-press processes.

Still, the formats had inherent limitations and proprietary architectures.

For example, they could address only certain aspects of a print job, they could do little to help in the authoring and revision processes, and they could not provide production automation systems with the ability to control and track jobs.

However, limitations and all, these formats have paved the way for improving the existing architecture, and indeed for improving the graphic arts industry as a whole.

In the last few years, there has been a call for the printing and publishing industries to refine and further develop the two critical deliverables of JDF: a standards-based, supply-chain infrastructure and a set of protocols specific to the process of creating, manufacturing and distributing printed information.

Leading companies in the printing world have answered this call – to create a new format that addresses these and other issues.

The result is a revolution targeting JDF development.

Why the fervor for JDF advancements?

In the beginning, all was manual. Then came mechanization – paving the way for automation and a new opportunity for press operators, via technology, to dictate in advance how each separate machine would function. In time, production controllers assembled systems involving machines with multiple capabilities to all be controlled by a centralized console. The devices themselves were not connected, nor was the process streamlined – but the potential was clearly recognized.

Once automation was in place, a job ticket format was the next logical step.

With these formats, printers could begin to segment larger sections of the print job and run each more efficiently. CIP3 – before the Consortium for the Integration of Prepress, Press and Postpress elevated to its current day CIP4 status – developed the PPF (Print Production Format) to create a means for jobs to flow between multi-vendor products.

The purpose? To allow cluster groups of machines to be controlled by a single job ticket. The result? More potential – the job ticket format handled a comprehensive variety of prepress, press and postpress processes and, without question, delivered a new clarity for the further automation of the print production process. The next step came in the form of Adobe's PJTF (Portable Job Ticket Format), which offered limited but very precise control of prepress processes, such as layout, imposition, trapping and RIPping, as well as significant widespread control over a variety of press processes.

What Is JDF?

The most significant capabilities of JDF can be divided into three principal categories: Its ability to complete every part of the job, from start to finish; its ability to link MIS with production and its ability to perform both of the first two tasks no matter what tools are being utilized. JDF provided a true mechanism

to control all 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.

JDF not only provides a solution – it delivers a redefined, flexible and comprehensive degree of control to the print production process. JDF creates a bridge between each separate task in the printing process, from the moment a creator moves a concept into fruition to the moment that concept is placed in the customer's hands as a completed printed product – regardless of the differing team of software or hardware employed to craft the printed piece.

In every way, JDF is the evolution of previous standards – delivering a flexible and comprehensive job ticket format that can effectively communicate critical phases of the print production process from machine to machine, all the while linking MIS with print production to facilitate a truly automated print production life cycle. JDF provides the mechanism to control all the processes in print production today as it enables MIS to control and track jobs and deliver a more flexible and effective control over print production.

While the first version of JDF was developed in 2000, the four companies that led the JDF charge – including Adobe Systems and Heidelberg – passed along control of the specification to the cross-industry consortium, CIP3.

This action ensured that all vendors could develop systems that fully utilize the potential of JDF and that no vendor would be disadvantaged with respect to any of its competitors. To this end, JDF was encoded with XML (a standard controlled by the World Wide Web Consortium (W3C)).

The JDF Timeline

In October 2000, the print industry begins to hear buzz about the JDF Specification Draft Spiral Version 4.0. Four companies prominent in the graphic arts industry – Adobe, Agfa, Heidelberg and MAN Roland – united to create this extensible, XML-based format built upon the existing technologies of CIP3's Print Production Format (PPF) and Adobe's Portable Job Ticket Format (PJTF). The purpose for this united front – provide three primary benefits to the printing industry – unify the pre-press, press, and post-press aspects of any printing job, provide the means to bridge the communication gap between production services and Management Information Systems (MIS) and carry out both of these functions no matter what system architecture is already in place, and no matter what tools are being used to complete the job.

In July 2000, CIP3 became CIP4. When the CIP3 consortium was originally formed in 1995, the intent was clear: develop standards that would facilitate a completely automated and integrated printing process, from prepress to pressroom to post-press. Hence the name, CIP3 – the International Cooperation for Integration of Prepress, Press and Postpress. The mission was embraced by dozens of technology





CIP4 is an international, world wide operating standards body located in Switzerland. The purpose of the association is to encourage computer based integration of all processes that have to be considered in the graphic arts industry, in particular the specification of standards, such as the JDF.

providers. Together, companies from Heidelberg to Adobe, MAN Roland to Agfa, formulated a new format, known as the Print Production Format (PPF). The specification is designed to enable printing workflows that reduce the need for repeated data entry. Most recognized as an enabling technology for ink-key presetting, the PPF, from the first version to its third, gained recognition throughout the industry. Then – on July 14, 2000 – something changed.

With more than 40 members working in a joint direction for the betterment of the PPF, the CIP3 consortium announced on July 14, 2000 that a new format, which had been fast gaining attention and implementation in the industry, would now be a rising star for its own efforts to automate and streamline the printing process. In a telephone conference call spanning three continents, the CIP3 consortium and the four companies that initiated development work on the Job Definition Format (JDF) – Adobe, Agfa, Heidelberg and MAN Roland – reached a final agreement on the details of handing over all rights to JDF to CIP3. The result: CIP4. The CIP3 consortium changed its name, officially, to the International Cooperation for Integration of Processes in Prepress, Press and Postpress, or CIP4. Immediately, work began among the collective technology members to start negotiations with other standards organizations with the expertise to work on extending JDF into areas such as digital printing and e-commerce.



In January 2001, JDF is viewed as an emerging standard administered by CIP4 in the print production market. The printing world begins to learn that JDF is a new, open standard for integration of all computer aided business and production processes. It is designed to streamline information exchange between different people, organizations and companies, as well as applications and systems. JDF is intended to enable the entire graphical arts industry, including media, design, graphic arts, on demand and e-commerce companies to implement and work with individual print workflow solutions.

In December of 2001, CIP4 releases the XML Schema and Software Development Kit for Job Definition Format (JDF). The International Cooperation for the Integration of Processes in Prepress, Press and Postpress (CIP4) reports the release of a draft XML Schema and a Software Development Kit (SDK) for the Job Definition Format (JDF) and related Job Messaging Format (JMF). Jim Mekis, Vice President of the PrintTalk Consortium, reports at the time: “The preparation of an XML Schema” represents a major milestone in the development of JDF as the open standard of interoperability in the printing industry. The XML Schema will allow developers to test the JDF they produce using standard XML tools.”

In April of 2001, CIP4 releases Job Definition Format (JDF) Specification Version 1.0. CIP4 announces the version 1.0 release of its XML-based Job Definition Format (JDF) Specification. The 463-page specification defines the Job Definition Format and its counterpart, the Job Messaging Format (JMF). JDF is defined to the printing world as an open, extensible, XML-based format “built upon the existing technologies of CIP3’s Print Production Format (PPF) and Adobe’s Portable Job Ticket Format (PJTF). JDF has the ability to unify the pre-press, press, and post-press aspects of any printing job. It also provides the means to bridge the communication

gap between production services and Management Information Systems (MIS). The printing world takes great interest.

On December 18, 2002, Seybold Editors nominated JDF as one of 'The Ten Biggest Technology Stories of 2002'. It was a time in the printing industry that truly defined JDF as a technology that had arrived – and harbored even greater potential for interoperability. During 2002, the JDF momentum escalated – with commitments from virtually every important vendor targeting print production. JDF was clearly viewed as a fundamental component in all the devices and software used in the printing industry, as reported by the editors of Seybold.

During 2003 and 2004, the printing world continues to see a great drive for JDF deployment and advancements. All major vendors targeting print production efficiency and automation are involved in JDF initiatives.

Three Leaders Target JDF In 2004

From Adobe InDesign, Adobe Illustrator and Adobe Photoshop to Adobe PostScript with Adobe Portable Document Format (PDF) accelerating the journey, the extensive collection of Adobe tools plays a vital role in print from concept to the final printed piece – with a concentration on JDF.

More than 10 years ago, Adobe introduced PDF – the most efficient file format to send to the RIP. Yet print providers needed more control of the PDF files customers were sending to them. Adobe responded with the recently introduced Adobe Acrobat 6.0 Professional.

Adobe encourages industry-wide adoption of the JDF standard by demonstrating practical examples of how the XML-based job ticket file format can improve communication between document creators and print production teams, and how JDF can automate complex print workflows. Adobe XML architecture, demonstrated at both Drupa and GraphExpo, offers enterprises a step-by-step migration from manual, paper-based workflows to streamlined, automated processes that accelerate the flow of business-critical information between employees, customers, suppliers, and constituents.

Adobe is in a unique position to enable easy JDF intent creation through integration with its widely used creative applications. Concept demonstrations of JDF creation in the Adobe Creative Suite integrate with production and printing systems in a number of Adobe partner's booths including EFI and Heidelberg.

As part of its collaboration with CIP4, Adobe will participate in JDF Pavilion, an area on the show floor hosted by CIP4, where attendees can get the most up-to-date information on the JDF standard through presentations, product literature, and JDF workflow demonstrations. As one of the founders of CIP4 and creators of the JDF specification, Adobe is committed to an industry wide, all-inclusive effort to bring JDF to market, and looks to the current and future members of CIP4 to assure cross-company interoperability.



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Turning to EFI, the company's commitment to open JDF standards throughout its product line and in its collaboration with companies such as Adobe and Heidelberg will be clearly evident at GraphExpo. EFI's JDF activities at GraphExpo are aimed at helping printers understand how they can apply JDF today, and how EFI's best-of-class products incorporating JDF support will help printers streamline their operations, increase their profitability and attract new business through value added services.

New solutions from EFI at GraphExpo that will showcase JDF begin with customer-facing web sites like EFI PrinterSite Exchange. These products use the EFI JDF Connector architecture to bring digital content, job tickets and e-commerce transactions into the business and production workflow at the printing operation.

Once the jobs arrive at the printing plant, JDF enables CIM by providing complete job ticket information for job planning, tracking and accurate billing in the EFI print management (MIS) systems, including EFI Hagen OA, Logic, and PSI, from the former Printcafe Software (acquired by Electronics for Imaging in October 2003). Content files and JDF tickets that describe how to produce the jobs flow from the EFI MIS into prepress workflow solutions (both from EFI and third-party vendors) via JDF.

When the job is ready to go to manufacturing, the MIS system communicates Job Ticket information to the press control via JDF. If all or part of the job is digital, the MIS system sends JDF data and content directly into EFI's Balance, Fiery and OneFlow workflow solutions. OneFlow can also receive and send JDF to manage CTP workflows.

EFI is also an active participant in the CIP4 JDF Pavilion at GraphExpo. EFI will showcase open JDF connectivity across multi-vendor workflows including EFI Hagen OA, EFI OneFlow, and EFI Balance. EFI is a partner member of CIP4, the standards organization behind the JDF initiative, and has participated in every CIP4 JDF interoperability test forum. EFI is committed to open standards connectivity.

At GraphExpo 2004, Heidelberg will showcase its family of Prinect Solutions: Prinect Management Solutions, Prinect Production Solutions, and Prinect Color Solutions. Prinect provides efficiency through the use of Computer Integrated Manufacturing (CIM) based on the CIP4 standards, PPF and increasingly, JDF. At Drupa 2004, Heidelberg announced and demonstrated approximately 50 Prinect innovations, further demonstrating its commitment to JDF.

All Prinect modules have a common goal: to transparently integrate all management and production processes in order to maximize printing efficiency. With Prinect, the use of a standardized workflow allows printers to work more efficiently. Prinect integrates new products with existing products across the entire production workflow – from prepress to press to postpress. Prinect incorporates a Print Management System, Prinance, to form a seamlessly integrated production and management system using CIP4-PPF and JDF Standard interfaces. The Prinect Printready System and Prinect Signa Station modules combine to provide a highly efficient and automated prepress workflow based entirely on JDF and JMF.

Prinect is an efficient workflow that greatly reduces redundant job data entry, freeing production operators to produce, rather than manage jobs. With Prinect, the job data is entered once, at the beginning of the process, and saved as an electronic JDF-job ticket that is transferred through all stages of production: from

prepress to press to postpress systems. This not only saves time and lets the operators concentrate on production, but it also greatly reduces the likelihood of errors that can otherwise result in additional waste in materials, time and money. Because Prinect is an open, modular, and scalable system it is easy to start small and add Prinect workflow modules, or JDF-enabled modules from other suppliers, as required to meet the demands of increased production.

Prinect is open to a variety of JDF-compliant applications (i.e.: JDF-compliant Print Management Systems). Prinect JDF Connector transparently provides a single point of entry into the Prinect environment, accepting and validating incoming JDF, and then distributing relevant data to production systems. Production data from these systems is collected and then made available to Print Management Systems. This approach ensures flexibility and compatibility without liability.

As a founding and partner member, Heidelberg remains committed to the CIP4-JDF standard, and participates in all CIP4 Interoperability Testing, as well as contributing to the JDF specification and Interoperability Conformance Specifications (ICS). At GraphExpo, Heidelberg will again participate in the CIP4 JDF Pavilion along with many other members who will demonstrate interoperability through JDF.

The Future Of JDF

Adobe, EFI and Heidelberg have carried strong JDF technologies to both Drupa and GraphExpo in 2004. These events represent a significant turning point for the future direction of digital print production.

JDF delivers the ability to carry a print job virtually from concept through completion. This includes a detailed description of the creative, prepress, press, postpress, and delivery processes. It bridges the communication gap between production and management information services – enabling instantaneous job and device tracking as well as detailed pre- and post-calculation of jobs in the graphic arts. JDF connects the customer's view of the product and

the manufacturing process by defining a process-independent product view as well as a process-dependent production view of a print job. JDF delivers the ability to define and track any user-defined workflow without constraints on the supported workflow models – including serial, parallel, overlapping and iterative processing in arbitrary combinations and over distributed locations.

JDF is the present day focus and future direction of print production – in 2004... and beyond.

For more information on JDF technologies and print production initiatives, visit www.adobe.com, www.efi.com, and www.heidelberg.com.





Glossary

Color Management Systems Electronic characterization, calibration and control systems that help to assure color consistency and accuracy throughout the print production process from scanning through previewing on screen and proofing to reproduction on press.

Computer-To-Press (CTP) A printing system that includes desktop publishing software, electronic prepress workstations and a new type of press which is capable of rapidly changing the images it is printing without the use of removable plates. Referred to commonly as CTP.

Extensible Markup Language (XML) XML stands for EXtensible Markup Language, a markup language much like HTML that was designed to describe data. XML tags are not predefined. XML uses a Document Type Definition (DTD) or an XML Schema to describe the data XML with a DTD or XML Schema is designed to be self-descriptive.

Image The digitized representation of a graphic element bitmapped in computer memory for display on a video monitor for output in paper or film form.

Computer Integration Manufacturing (CIM) Computer-integrated is a vast concept for digitizing, automating and integrating print production processes. Advances in technology have led to workflow being widely viewed as a digital continuum, from file creation to final output. This shared vision meets with the industry's move toward CIM and implementation of the JDF (Job Definition Format) specification.

CIP3/CIP4 CIP4 is the International Cooperation for the Integration of Processes in Prepress, Press and Postpress (CIP4) – formerly known as CIP3, the International Cooperation for the Integration of Prepress, Press and Postpress (CIP3). CIP4 today is an international, world wide operating standards body located in Switzerland. The purpose of the association is to encourage computer based integration of all processes that have to be considered in the graphic arts industry, in particular the specification of standards, such as the new Job Definition Format.

Job Definition Format (JDF) The Job Definition Format 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/JMF (Job Definition Format/Job Messaging Format) An XML-based digital job ticket specification on its way to becoming a standard. It is being developed under the direction of CIP4 (the International Cooperation for the Integration of Processes in Prepress, Press and Postpress).

Portable Job Ticket Format (PJTF) Adobe's PJTF is the production job ticket format based on PDF. Following a thorough technical analysis, the CIP3 general meeting recently approved a new PJTF encoding for the CIP3 PPF format.

Print Production Format (PPF) The Print Production Format is the specification developed by CIP3, currently known as CIP4, that defines how an organization passes production data from prepress to press to postpress. Currently, version 3.0 of the PPF is based on Adobe's PostScript language.

Production Automation Use of a centralized computer to monitor costing, workflow, job status, pressroom efficiency, billing and other administrative and production processes critical to the concept to fulfillment process of print production.

Prepress Camera work, color separating, stripping, platemaking and other functions performed by the printer, separator or service bureau prior to the actual printing. Includes the function of the prepress Proof, any color proof made using ink jet, toner, dyes or overlays.

Printing Any process that transfers to paper or another substrate an image from an original such as film, electronic memory, die or plate.

Portable Document Format (PDF) The de facto standard for the secure and reliable distribution and exchange of electronic documents and forms around the world, with a ten-year track record. PDF is a universal file format that preserves the fonts, images, graphics, and layout of any source document, regardless of the application and platform used to create it.

RIP Abbreviation for raster image processing, a hardware and/or software system that translates page description command into bitmaps for output to a laser printer or imagesetter.