JDF Workflow in Practice—
Revealing the Benefits of Automation

JDF workflow in the graphic communications industry is generally understood to be an integrated process based on the twin open-standard formats of Job Definition Format (JDF) and Job Messaging Format (JMF).

The stated goal of a JDF workflow is the automation of process steps through the integration of disparate applications and systems. The basic idea is simple: to summarize information about a print job and pass it on to the stakeholders who require it. It also encompasses goals such as error reduction, time savings, and cost transparency.

What exactly is JDF? JDF is only a data format and not a workflow. JDF is sometimes called an “electronic job ticket,” but it is actually much more because it would be a job ticket that could, for instance, control automatic workflows, preset machines, and log the working data.

This introduction to JDF workflow provides an overview of the practices of three printers, which we will call X, Y, and Z:

- Company X has a workflow that is completely up to date, but it contains no specific JDF features.
- Company Y has implemented a few components that use JDF.
- Company Z is largely JDF/JMF networked.

How do they compare with your company? While reviewing their activities, think about what benefits of the JDF features you are able to identify as the workflow of each printer evolves. Would any of your processes benefit from JDF integration?

JDF can offer support:

- In transmission of order data
- In transmission of setup data
- In collection of production and machine data
- For planning
- In order tracking
- Between estimating programs, such as an MIS and production
- Job tracking and costing of orders
- Of e-commerce links, such as requests, quotes, order confirmations
- And more

Job Tickets

Job tickets are defined as electronic information packages supporting workflow management systems in the graphic arts industry. A job ticket, for example, can be a work instruction or a set of parameters to control the print job. In particular, job tickets can be written in Job Definition Format. In other words, JDF is an example of a job ticket format.
**COMPANY X:**  
**COMPANY WITHOUT A JDF WORKFLOW**

Full-service Company X only has 12 employees. Several years ago, a modern workflow management system (WMS) was installed in the prepress department with a form proofer and a platesetter as output options. The WMS can also create PPF data (see sidebar on page 3) for presetting the ink zones, but this functionality is not yet being used.

**Equipment and Workload**

The pressroom works on three web offset presses: a 5-, a 4-, and a 2-color press with formats up to 19.7 x 27.5 in. (50 x 70 cm). There is also a digital press with inline finishing.

The finishing department has guillotine cutters and folders, as well as a stamping and embossing book printing cylinder.

About fifty jobs are completed each week, and many consist of multiple subproducts.

**RFQs and Planning**

Requests for quotes mostly come in to the shop through email or telephone, sometimes by fax. A clerk or customer service representative (CSR) enters the most important details of the request into the order management system (OMS).

The estimate is often performed by the owner himself, for which he only uses a price table and pocket calculator. In about a third of the requests, information required to do the calculations is missing and the potential client must be called back. The number of estimate revisions that are requested by potential customers has grown dramatically in recent years. In particular, advertising agencies often wish to slightly modify estimates for their jobs.

The ratio of awarded contracts and quote offers is under 10%. Like the awarded contracts, the print job data is mostly sent as email attachments, of which 80% are PDFs; the rest are open data (InDesign, QuarkXPress, Microsoft Office Suite).

The CSR then orders the paper, determines the imposition, assigns the job to a press, and prints a run ticket out of the OMS. For orders over $700 USD, the CSR also sends a confirmation to the customer.

**Prepress and Approvals**

The prepress department of Company X then examines the supplied files with a preflight program, where about two-thirds of the supplied files have errors and must be corrected. Any errors that can be corrected within ten minutes are resolved immediately without contacting the client and without any charges levied.

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**JDF Workflow?**

A workflow is a series of defined work steps whereby sequences of activities are triggered through events that are controlled and terminated.

Workflow management includes the tasks of definition (modeling), management, execution, control, and sometimes the simulation of workflows.

A workflow management system (WMS) is groupware (a software and hardware solution for CSCW, computer supported cooperative work) to support workflow management, or a computer-based application that will help define, manage, and control sequences of operations.

Therefore the term JDF workflow is actually not totally correct; rather you should talk about a “JDF-based workflow management system.” But because this is a mouthful, the concept is generally referred to as “JDF workflow.”
PPF: Print Production Format

PPF and JDF/JMF are interface formats for networking solutions. Both formats serve the principle of the industrialized production of press products, which is in contrast to the former, more handwork-oriented production methods seen in the past. In this context, the commonly used buzzword is computer integrated manufacturing (CIM).

PPF makes possible the transmission of technical data, mostly from prepress to the pressroom, or input to postpress.

**Distribution of PPF information.**

The most widely used application is the storage of a preview image of a signature in a PPF file, a task completed by the RIP which precedes the plate burner. This preview image is then transferred to software which can calculate the resulting ink zone settings for an offset printing press.

**Detailed PPF workflow.**

Another example of the PPF workflow is the passing of information about the cutting and folding of a sheet from the digital layout to finishing. The corresponding marks are set, and subsequently the information is written in a suitable manner in the PPF file. Software capable of interpreting PPF can then generate a cutting or folding program for a guillotine cutter and folder, respectively, in a proprietary data format.

So in PPF no machine control data is passed on; instead abstract information is passed from which the machine control data can be generated.

In summary, the PPF workflow offers the following advantages over a method of production without PPF integration:
- Technical data, especially for machine settings, may be shared across departmental boundaries.
- Entering data (such as sheet size) in multiple areas can be eliminated.
- Certain process steps could be removed through the handoff of the technical data, for example eliminating a standard flatbed scan earlier in the process to produce a color-key setting.
- Through the publication and standardization of the Print Production Format, PPF-compliant modules from diverse manufacturers may communicate with each other.
After digital prepress, a form proof is issued which is sent to the customer via mail or by carrier. Only after the proof has been signed off and approved by the customer are the plates output. If the order is a rush and the customer has been known for years, a PDF proof of the press sheet may be created and sent by email to the customer for inspection. If the client explicitly requires a color match proof, it will be created at another company.

**Pressroom Production and Order Completion**

The plates then go to the pressroom. A large wall calendar serves as the planning board on which the end dates of the orders are entered. Unfortunately, this does not always work out because the CSR sometimes forgets to copy the due dates to the hanging calendar in production.

During production there are often changes. If the customer calls to make a change to the order, the CSR searches the shop for the run ticket and inserts the changes.

The invoicing and dunning processes (pursuing accounts receivable) are supported by the OMS. There is also an online interface to the tax authority.

A costing of the order occurs only sporadically and, when it is, is done manually. The daily run sheets are completed only occasionally, and are then used from time to time to verify the internal price table for estimating.

Order processing for digital printing is identical to the procedures for offset printing.

The owner thinks that highly productive and automated production equipment could be used in his company, but order handling has not reached the same level of automation. In fact, this is a very typical situation in smaller printing companies.

**Print Service Provider Y: Company with a Partial JDF Integration**

Print Service Provider Y primarily prints catalogs, magazines, and magazine inserts on its two large web presses and prints most of the covers for these products in IIIB format on its sheetfed offset press.

**RFQs and Planning**

The firm receives requests for quotes from existing customers or from sales reps who acquire new customers. The sales reps use a paper-based quote request form to collect details such as page count, circulation, paper, color, etc. Orders from the inside sales staff are recorded in an OMS; for new customers, the customer’s basic information is also entered.

The estimating is done with the OMS as well. The quotes are sent to the potential customers, and the sales staff follows up with the lead, if necessary, to renegotiate and issue amended quotes.
When the order is placed, information for the production planning and control department (such as required press capacity, order date, and delivery date) is printed out of the OMS. The employees in that department plan the job and place the corresponding card in the planning table. The planning data is not passed back into the OMS, so scheduling conflicts are not automatically reported in the OMS.

The paper order is triggered by an inside staffer after consultation with the paper purchaser. The order is then automatically sent to the paper supplier. Naturally, the OMS sends an order confirmation to the customer in parallel to this.

The sheet plan (fold, press sheets, and pagination) are specified in the OMS. Production details that were not necessary for estimating are also entered, such as the specifications for the RIP.

The OMS then generates an electronic order ticket for each job as an HTML document so that all of the information is available company-wide.

**Prepress and Approvals**

A separate paper document is printed out for the prepress department in which the processes are listed and signed off on after completion by the staff. Information is transferred using JDF from the prepress workflow system so that many of the values entered into the OMS can be automatically transferred.

From there, data is passed to the printing presses, mainly ink zone presets in PPF format but also preview images for the color-accurate soft proof which is used for color matching.

The press approval is made by the customer either via a classic hardcopy proof or even, especially in less substantial products, via an Internet portal. Within the portal, the customers of the print service providers can make correction requests or grant approvals which flow directly into the prepress workflow system.

**Pressroom Production and Order Completion**

The plant data collection occurs via terminals into which the staff’s working hours, cost centers, setup times, and the like are entered.

The presses provide status information to a networked machine automation system; however, it has no connection back to the OMS. Here, the benchmarks must be transferred manually. The OMS then determines the final costing, meaning the variations between the estimated costs and the actual situation.

This example makes two things clear. First it shows the improvements in production that are achieved by an OMS and the corresponding JDF interfaces. It also shows the typical dilemma of JDF: many interfaces, such as online press approval or between the OMS and production planning, are only partially achieved with proprietary data formats or are only manually operated.

**Business Z:**

**Company with Extensive JDF/JMF Networking**

The fully integrated Business Z, with 150 employees, is a typical full-service printer that not only prints books, brochures, and magazines, but also business documents and business cards.
RFQs and Planning

Orders are generally received via email and fax. The estimates are done in a management information system (MIS). The MIS has an online link to paper suppliers, and each night the current daily price is automatically updated in the system. Inventory for the paper order is verified directly over the Internet to the paper supplier against stock in the high-rack warehouse. The interface is conducted through a proprietary messaging protocol (XML, see sidebar at right).

If an estimate becomes an order, an HTML job jacket is available to anyone across the enterprise and is generated directly from the database at each request.

The MIS generates a single JDF file per order, which is passed on to a workflow server in the production area. All of the production data relevant to the instructions are stored there.

With the help of the JDF data, not only can electronic production planning be carried out, but the jobs can also be handled in prepress. The latter means that the imposition, layout, and other production data can be transferred from the JDF file and, if necessary, can also be modified.

Customers often upload the print data to the print shop’s server via the Internet. The print shop’s production system receives the message that the data has been received and processes it. The results of the verification are recorded in the associated JDF file and also sent to the customer.

Pressroom Production and Order Completion

Four of the six printing presses receive the necessary data, such as sheet size, ink zones, and colors, via JDF/JMF. Device settings and information about the order are reciprocally sent back to the workflow server.

Two other older offline presses are connected via terminals. The workflow server, for its part, sends a portion of the operating and machine data, received from prepress and the presses (for example, plate consumption or specific job-related milestones like completion of the plates or the end of the press process) back to the OMS.

The postpress finishing machines are not currently directly networked; the shop floor data collection takes place exclusively via data-entry terminals.

After the completion of production, the OMS prints out a shipping order. However, a data connection to the logistics companies was not implemented because shipping is carried out by too many different companies, often by small local shippers which have no system connectivity to take orders.

Even with this company it is clear that, despite the very high degree of connectivity, many areas are still not integrated with JDF/JMF. This includes, for example, finishing, where there are long-standing, vendor-specific workflow solutions. Because of the typical long investment cycles in this area, it takes many years for new technologies to be employed.
As you can see from the three company examples, there are many ways to run a production workflow, and many ways to incorporate automation. Company X demonstrates the number of human touch points that can be involved in a process. Print Service Provider Y shows how improvements in production are achieved through an order management system and JDF interfaces. And Business Z illustrates that even with more JDF/JMF networking, some sections of the process may remain unintegrated and why that might be the case.

What’s Next?

There are many considerations to keep in mind when considering your workflow and JDF networking. These samples were excerpted from the book *JDF Workflow: A Guide to Automation in the Graphic Communications Industry*, by Thomas Hoffmann-Walbeck and Sebastian Riegel.

*JDF Workflow* provides a basic knowledge of the format as well as a comprehensive examination of the workflow that can be built with the help of JDF. Typical graphic communications production processes are presented with the help of many examples from order management systems, prepress, printing, and finishing.

Topics include:

- General characteristics and expectations of a JDF workflow
- Analysis of the process-resource model
- An introduction to XML
- Important JDF structures
- Job Messaging Format
- Workflows and their JDF equivalents

For more information on this and other resources, visit [www.printing.org](http://www.printing.org) or contact Printing Industries of America’s Member Central Department at 1-800-910-4283 ext. 770, 412-259-1770, or membercentral@printing.org.