

# 2005 CIPPI Honorable Mention

## Most innovative use of process automation technology in an implementation

### Williamson Printing Corporation

Williamson Printing Corporation, Dallas, TX USA. Submitted by Freddy Pieters, Manager Commercial Printing Workflow at Esko-Graphics.

**Products incorporated:** Esko-Graphics Scope workflow version 1.0 (Fully network and web enabled Scope workflow manages multi-site, distributed production workflows), Creo UpFront Version 3.1 (Print production planning tool)

**Background:** Imposition is often the single process in a prepress workflow that takes the longest time by hand. In the case of the complex high-end work that Williamson Printing specializes in, it typically takes 15-30 minutes. Whenever they received an order from a customer, Williamson's customer sales reps (formal title: production managers) used to draw an imposed layout plan for the press by using paper and pencil. It was inadequately inefficient and outdated. In addition, their production managers usually had to wait an additional 15 minutes until an imposition workstation was freed up, because imposition software is not inexpensive, and was not available on every desk.

In their bindery and post-press department Williamson used to set up their cutters manually, which also took 25-30 minutes to accomplish.

**Objectives:** Implementation of the system reduces errors in prepress as well as prepress operator time. Williamson hoped to be more efficient. As Joe Novak says, printing is very competitive and Williamson cannot charge whatever they want. They have to find ways to make their bottom line more attractive.

An important cost factor is elimination of mistakes. With automatic imposition in prepress, the reduction of operator error eliminates the time (and, at times, out of pocket costs) associated with make-goods. In the past, production managers who were conducting imposition by hand would reference paper copies of similar imposition layouts. At times, these paper copies were misplaced, or accidentally thrown away. With JDF, the expectation was that impositions would be safely stored in the computer production system and re-usable.

Williamson installed the JDF system because, as Joe comments, it's the future. He also likes it because, quite simply, it works. When, in the future, Williamson completes its entire implementation of JDF, the entire company, from accounting software to press to shipping (and receiving) will be automatically directed by JDF instructions.

A second step, in process and due over the next few weeks, is implementation of softproofing via JDF. It will allow Williamson to send an imposed proof electronically, rather than printing, cutting, and binding samples by hand and sending them via overnight courier. This JDF-based link will be established between BackStage, the server part of the Esko-Graphics Scope workflow, and Remote Director of ICS.

The last thing Williamson is going to do is replace the scheduling board (similar to a 'scoreboard') with a large plasma TV to view job status information in real time: identifying the piece of equipment where a job resides at any moment of time. The monitor will also alert the plant of any problems that arise.

**Methodology:** Williamson just received a new PRISM system. The presses are new and JDF enabled. Williamson does not have some of the problems that others have when they do not own JDF enabled equipment. It could require a major investment to update. Williamson has always believed in owning the 'latest and greatest' software. As Joe Novak comments, they 'lead and bleed' if they have to.

As the PRISM system did not offer the required functionality in the area of imposition, Williamson selected Creo UpFront software to allow production managers to move on from paper to computer-based JDF systems. Williamson had been successfully using the Esko-Graphics Scope workflow for many years in prepress.

Everything was dependent upon the already existing IT software, the existing Esko-Graphics Scope workflow, and a more modern JDF-enabled job entry system, UpFront – as well as minor changes to the company's ICS proofing system (to come shortly). Joe Novak admits that they are fortunate that all of their systems and modules are relatively new, so they were all JDF enabled. Williamson held many meetings between Esko-Graphics and Creo to combine resources and to get automatic imposition done.

**Implementation Story:** Barco Graphics, which merged with Purup Eskofot to become Esko-Graphics, was one of the founding members of CIP4. There was a strong belief that the handing over of JDF to the CIP4 organization was a good move to give this initiative the credibility and power to make it a success. That was back in 2000. The company followed up on JDF with a lot of interest, but in those early days it was still unclear exactly how JDF could be put to use within the context of a prepress environment. The specification allowed for many things, but because the strongest point of JDF is that it allows the interfacing between processes in different departments, it was quickly clear that any implementation would have to be done in concert with like-minded companies.

The usefulness of JDF is at its highest when one step in the print workflow is feeding information to the next step in such a way that a manual process in that next step can be automated. When looking at it from the perspective of the automation needs in prepress, it was quickly evident that the MIS plays a crucial role. It is the starting point of a job's life within the printing company and it is also the place where the way in which it is processed is being defined. In other words, it was necessary to investigate to what extent MIS could provide JDF information to automate processes in prepress.

In 2002 Esko-Graphics started investigating the capabilities of MIS more in depth with the specific target to identify MIS-contained information that met two criteria: it had to add value to prepress and it had to be expressed in JDF. The following items were identified:

- Administrative job data, such as job name, customer name, delivery date, etc.
- Intent data, such as the number of pages, trim sizes, the colors of the job, etc.
- Process data, such as the number of sheets, paper sizes, finished page properties, unfinished page properties, folding schemes, etc.

The first item was not problematic. It can be easily expressed in JDF and it is helpful information for prepress – although its added value is not very high. The degree to which administrative data is managed in prepress is fairly minor and, because the amount of data is also little, no significant time savings can be obtained.

The second item is more substantive and can also be expressed in JDF. This information is not driving a process in prepress, but it is useful information to allow a prepress operator to check if the work or the graphic files supplied by the customer match the way in which the job was estimated in MIS.

The third item was definitely the most promising. One of the most important responsibilities in prepress is the building of the imposition, and it was found that many, although not all, MIS systems possessed the necessary information to describe an imposition at a high level. This certainly opened up the opportunity to use that information and automate the creation of the imposition in prepress. There was one major problem, though. Sifting through the JDF specification did not yield a valid JDF way of expressing this. The JDF process that came closest was Layout, but it had serious shortcomings.

JDF Layout describes an imposition in terms of rectangles with a certain rotation placed on an XY-grid. There were two shortcomings to using this method for automating the imposition step in prepress. First, the exact XY positions are not necessarily known by the MIS system and MIS is usually not capable of defining marks to any satisfactory degree. Although it would be theoretically possible to correct erroneous XY-positions of the JDF Layout and to add missing elements like marks, it would mean that the goal of automating the imposition step would not be completely achieved. Moreover, the correction of

a bad or incomplete Layout would take longer and would be more error-prone than to start the imposition from scratch in prepress.

Being an active member of the Prepress working group of the CIP4 organization, Esko-Graphics decided to formulate an alternative high-level method of describing an imposition which met two criteria: it had to be relatively easy for an MIS to initiate the JDF process, and it had to allow prepress to enrich the description with print technical requirements like creep, bottling, press marks, etc. This alternative was submitted to the Prepress working group in April 2003 under the name LayoutObject. After several iterations and a final rename to Stripping, it was approved for inclusion in the JDF 1.2 specification in September 2003.

It was obviously imperative for MIS and/or planning applications to produce JDF Stripping in order to make the concept work. The first MIS vendor who was convinced of the added value of the above method of working was CERM. The first prototype linking the CERM software with the Esko-Graphics Scope workflow was realized in November 2003. Between that date and drupa 2004, another eight MIS vendors added support for the output of Stripping to their products.

In parallel, several evangelical actions to promote the concept of Stripping were taken: attendance at the CIP4 interoperability events, attendance at several Euprima meetings, and direct contact with MIS vendors and potential users. In the last category, Williamson Printing was chosen for several reasons: their eagerness to automate as much as possible, their expertise in doing so, their long-standing relationship with Esko-Graphics, the quality of their work, and the diversity of their impositioning needs. In view of the workflow at Williamson, it was certainly necessary to involve Scenicsoft (still the name at that time) whose product, Upfront, was being used by Williamson for imposition planning. The first contacts with Williamson and Scenicsoft were established in June 2003 to investigate the possibility of adding Stripping output to Upfront.

UpFront customers and MIS and prepress vendors have requested that UpFront would export its imposition so that it can be imported by other systems i.e. typically prepress. This would solve another time consuming step of re-entering or updating this info in the MIS and/or Prepress software.

UpFront 3.0 can currently export the imposition to Preps by means of a Preps native template and job file. The main advantage for this workflow is that also marks can be set on top of the imposition. A big disadvantage is the Preps proprietary format which cannot be imported by other systems.

The StrippingParams resource that is part of the JDF 1.2 specification is an answer to the problem. This process makes it possible to describe the imposition.

UpFront 3.0 can export JDF version 1.1a. A new UpFront 3.1 alpha build has been created by the UpFront development team that can add the JDF 1.2 StrippingParams process to the JDF files. However, this is a prototype implementation and it does not guarantee that the entire JDF file is version 1.2 compliant. UpFront Job Builder also exports the JDF information for the cutting, folding and binding machines.

The first link between Upfront and Scope was finally realized in May 2004 at Williamson and has been in use ever since. There have been the inevitable minor problems on both sides that have required correction, but now Williamson is using the JDF Stripping interface for 85% of its production. The benefits that have been realized are:

- The prepress operator time to recreate an imposition has been reduced by 95% per job
- The number of errors in prepress has been reduced by 100% (in other words, zero errors)
- Job latency has been reduced by 1hr. Jobs are no longer waiting hours before the imposition gets done; it is instantaneous.

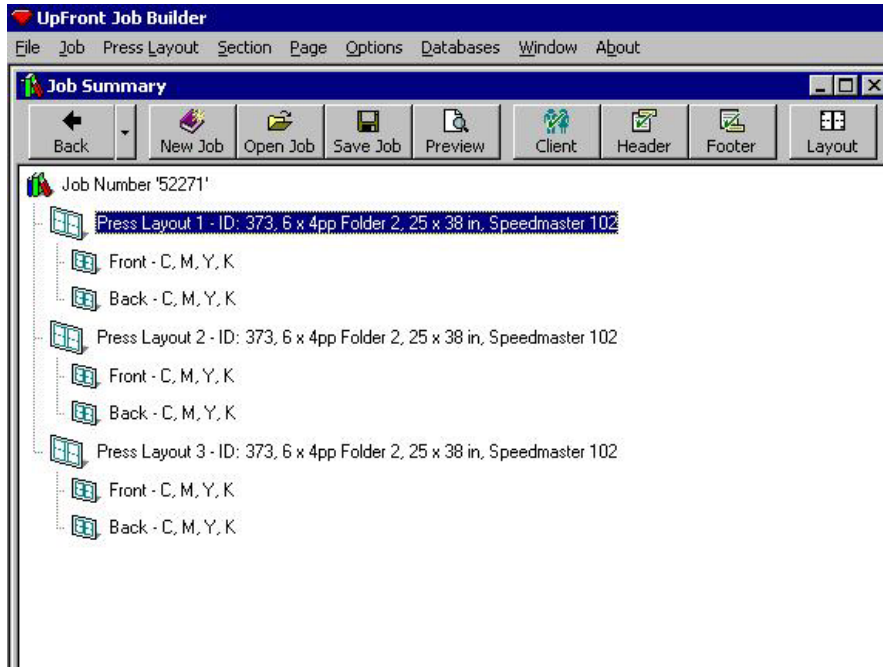
### **Resulting Workflow/Process:**

Now, data is received by production managers and entered into the company's UpFront system. After the calculation of the most suited imposition for that particular job, a JDF file is created that is exported to the Esko-Graphics Scope workflow. The workflow, using that data, automatically generates an imposition

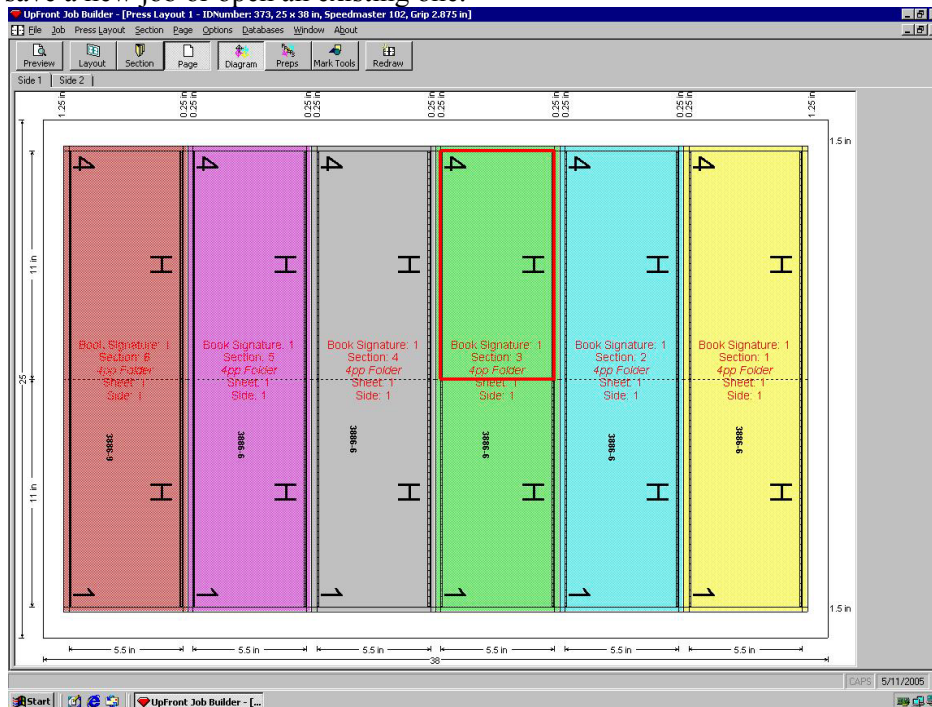
layout. The pages are entered into the page list of the imposition in prepress, as that information is typically not available at the moment of the calculation of the imposition in Upfront.

The production managers no longer have to create their own impositions by hand, and the prepress operators no longer have to reenter that information manually in Scope. Everyone is happy. Information about the imposition is also sent to the finishing machines. The following steps need to be taken by the production manager in UpFront:

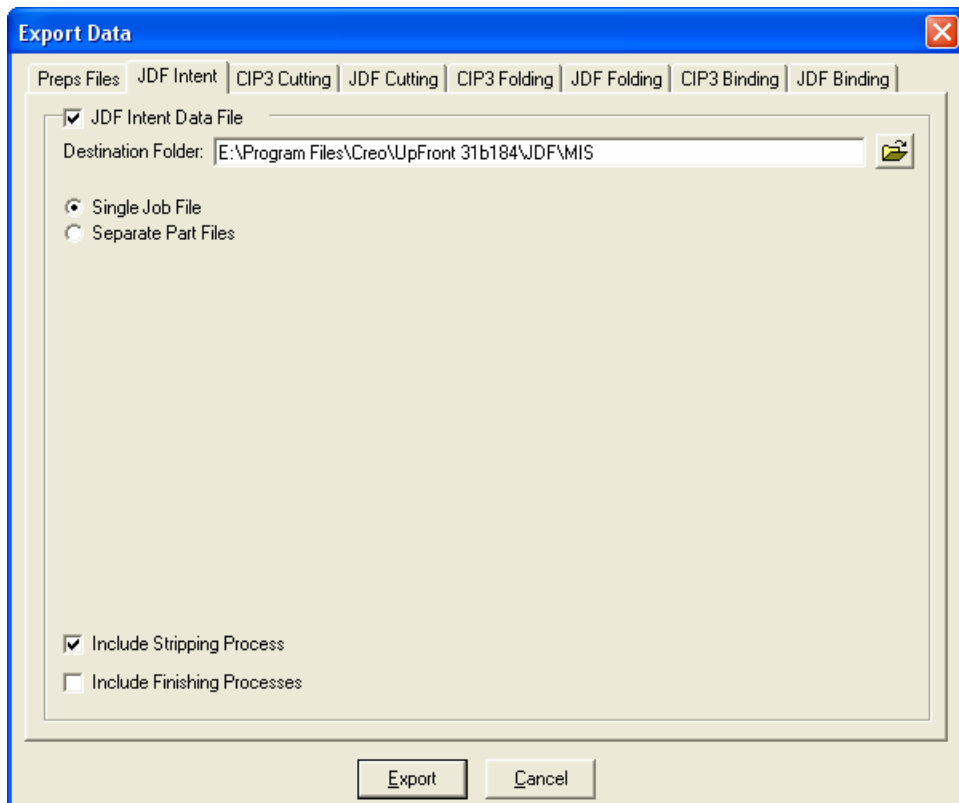
- Launch Job Builder.



- Create and save a new job or open an existing one.



- Select “Export Job...” from the “File” menu.
- Select the “JDF Intent” tab in the “Export Data” dialog box.

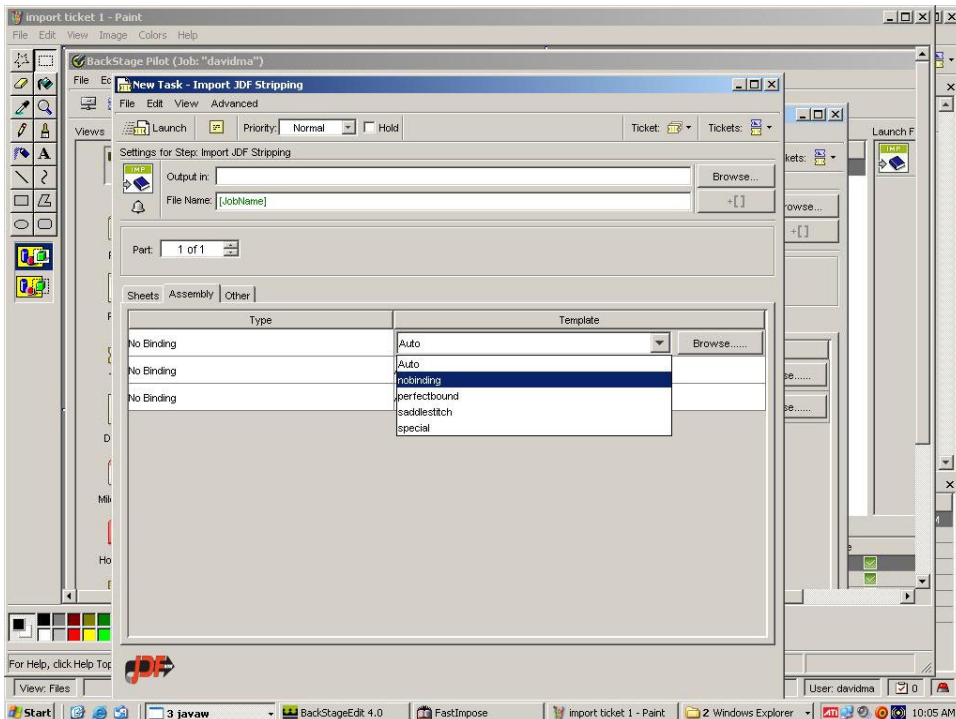
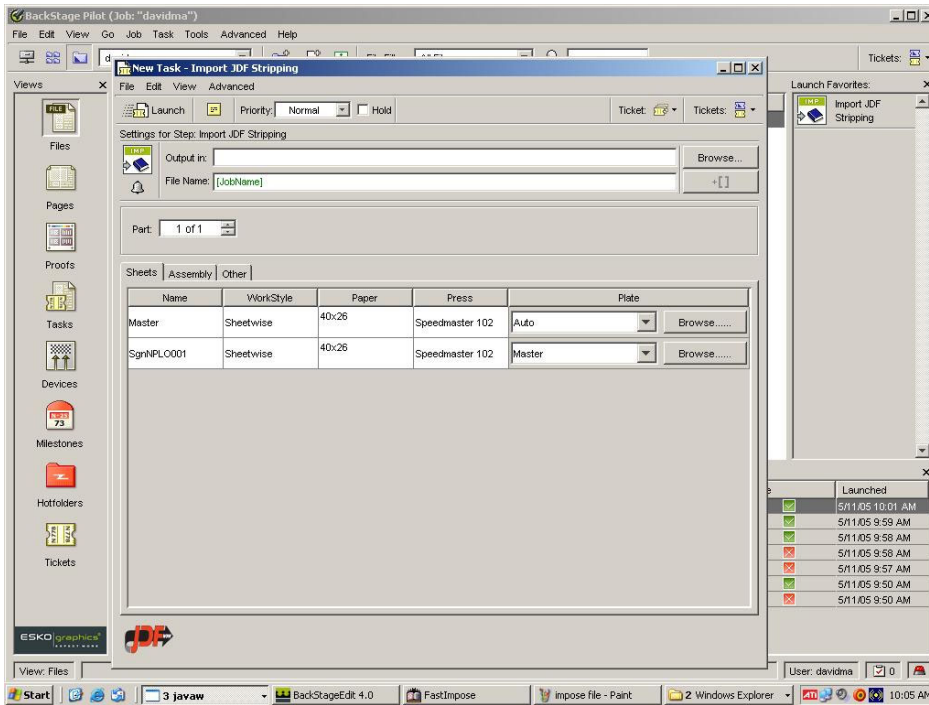


*Above screen grab is the property of Creo, Inc.*

- Check the “JDF Intent Data File” checkbox.
- Check the “Include Stripping Process” checkbox.
- Select the “Export” button.

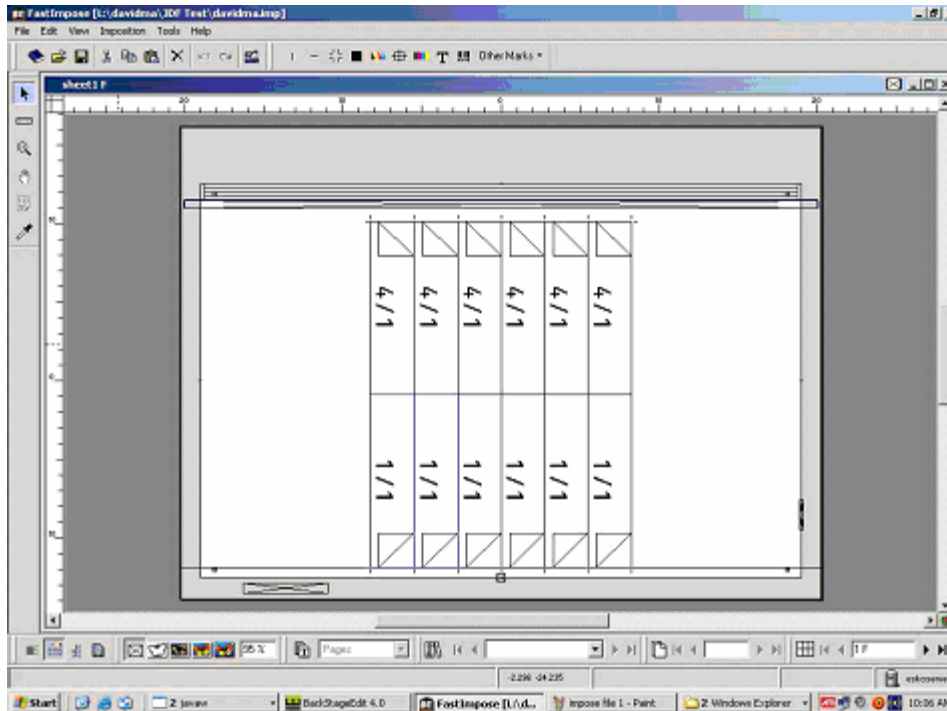
With these steps, the user has created a JDF file containing the JDF 1.2 Stripping process. The JDF file contains the imposition that can be imported by another system. The “Include Finishing Processes” checkbox includes the entire cutting, folding and binding process data into the JDF file as well.

*[All copy from “The following steps need to be taken by the production manager in UpFront:” (page 8) to this point is the property of Creo, Inc.]*



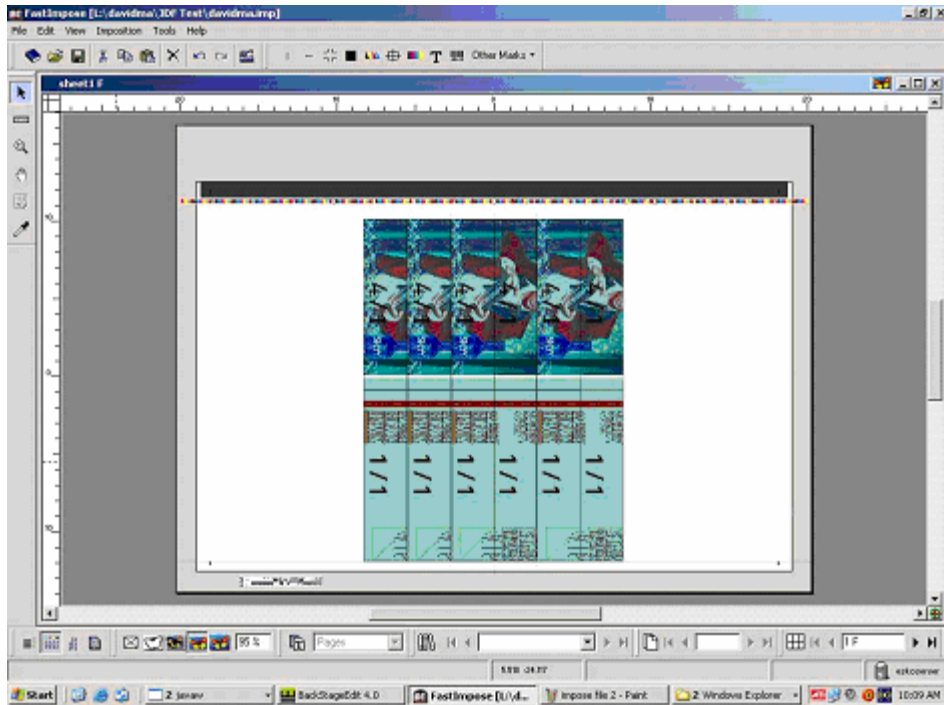
The prepress operator then imports the JDF in BackStage, the workflow server component of Scope. This creates the job if necessary and converts the JDF 1.2 Stripping process to a FastImpose imposition file.

The resulting layout is now available in FastImpose with all the marks dynamically added as they were configured in prepress. The pages are not present yet as they are not added in Upfront.



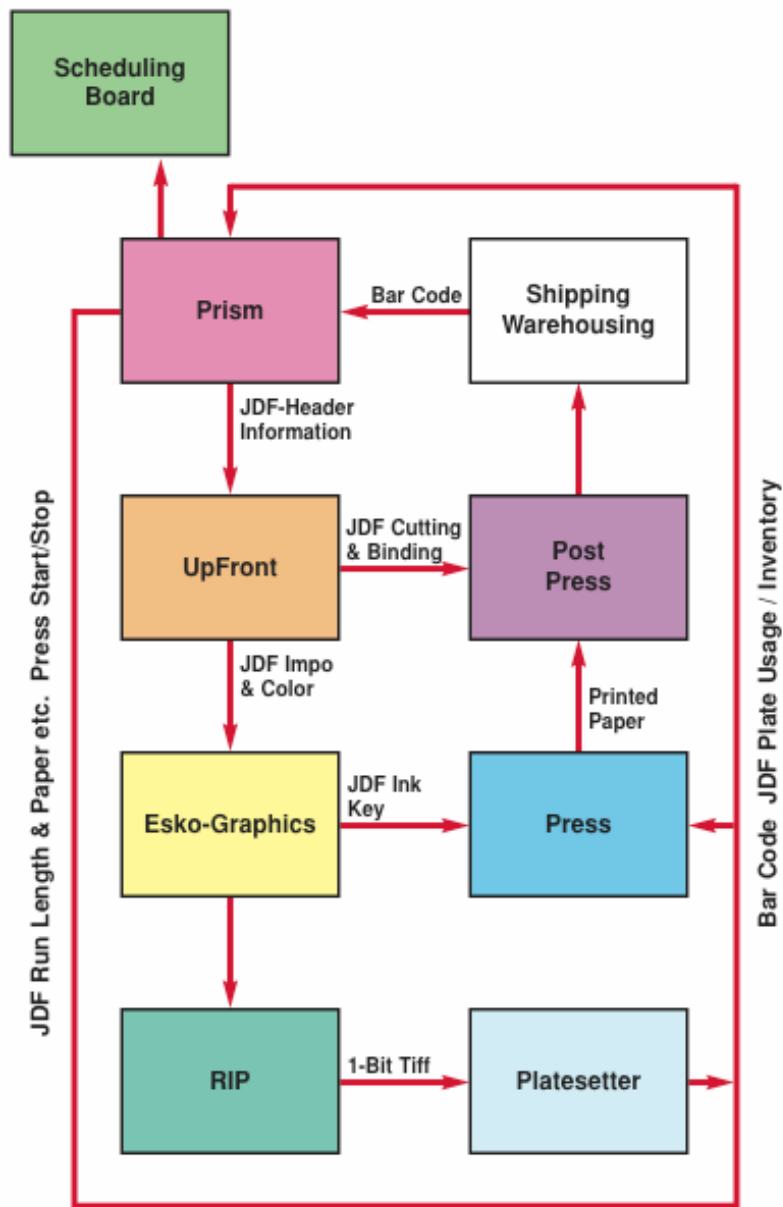
The high-level information provided by the JDF Stripping process allows keeping the intelligence of the imposition description, which makes the layout editable. Changing finished sizes, trims, bleeds, sheet positioning, etc. can still be done. This is ideally not desired: the imposition was determined by the production manager and the prepress operator should not have to change it, but it is important that last-minute changes to the imposition can be easily done in prepress when a production manager is not available, e.g. during the night shift.

Now the prepress operator can add the pages to the page list of the imposition. This process of page assignment can also be done using JDF. The typical supplier of that information would be the customer and not the production manager. This aspect of JDF integration is not yet implemented in the Williamson workflow.



*Note that imposition is similar to that in UpFront – all instructions were communicated via JDF.*

The imposition is now ready for proofing (hard or soft) and exposing. There is also JMF messaging between PRISM and prepress, as well as between UpFront and the postpress devices – which ultimately connects back to PRISM as well. With this connectivity, Williamson gets an instant, accurate status of any device it chooses to look at – either the postpress devices (already implemented) or any press (implementation to come). Ultimately, the JMF messages will be sent to the proposed scoreboard for an up-to-date view of any job or any device on the floor. Planning can be ‘real time’, and reaction time is instantaneous – for example, if a press runs out of paper.



**Details for most innovative use of process automation technology in an implementation:**

New in JDF version 1.2 is Stripping. An MIS system knows ‘what must be produced by prepress’. But, a MIS system also knows ‘how a product must be produced by prepress in terms of press sheets and their imposition style.’ The new JDF 1.2 Stripping process was specifically designed for the latter purpose.

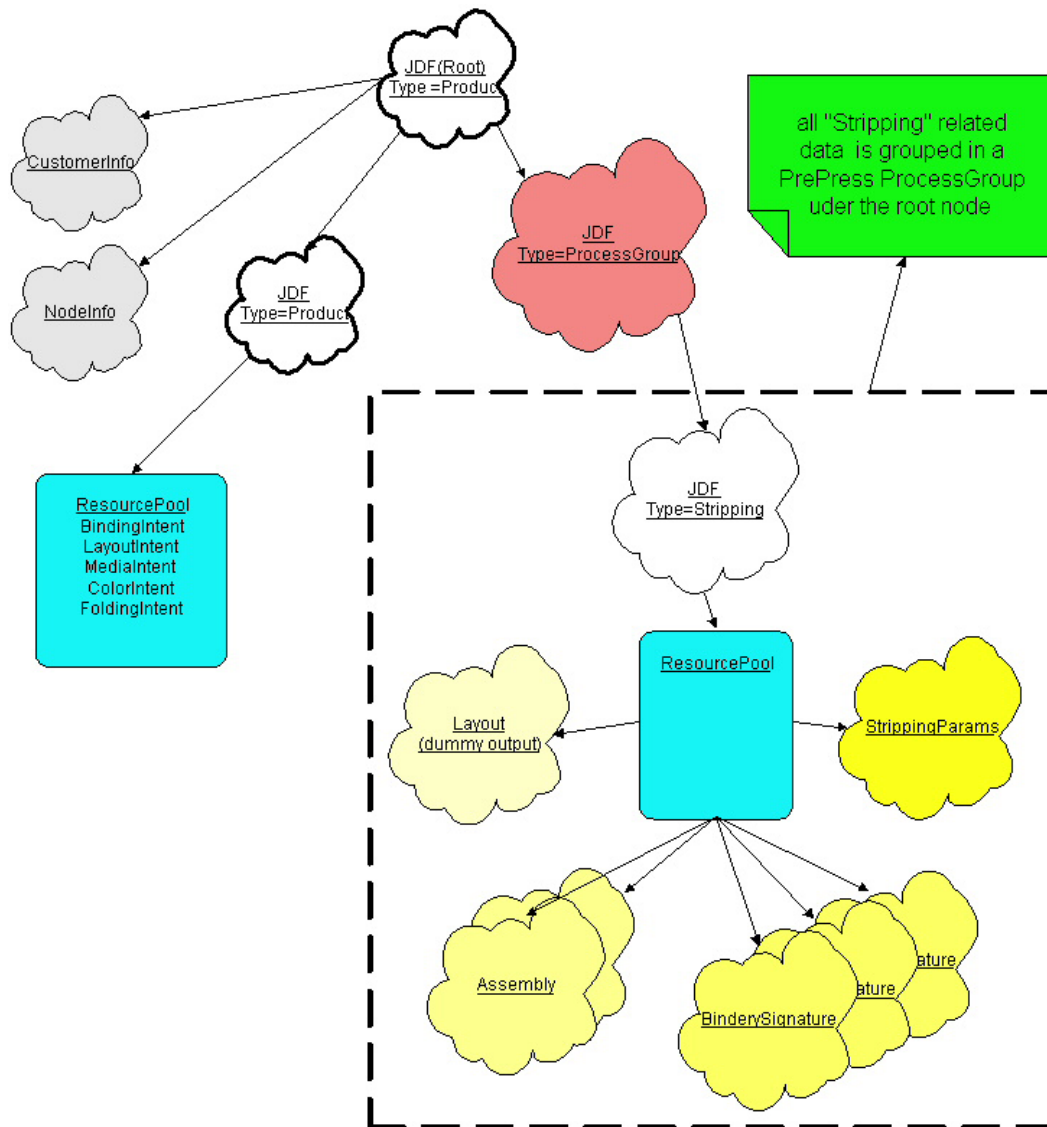
An important aspect of the interface between an MIS system and a prepress workflow system is imposition. When an order is accepted, or during the estimation phase, the MIS system determines how the product will be produced using the available equipment (e.g., presses, folders, cutters, etc.) in the most cost-efficient way. The result of this exercise has an influential impact on imposition in prepress. The Stripping process provides a high level structured description of the imposition of one or many job parts into a Layout resource for the Imposition process. The Stripping process can also generate all information needed for Imposition.

Under existing methods, imposition undergoes three steps, two of which are somewhat redundant. The estimation department separates a product into press sheets, taking into consideration the available equipment such as presses, folders, and cutters. From there, the estimator takes the most cost efficient combination and creates a ‘good enough plan’ for imposition.

The Planning department performs the previous exercise again, after the order is accepted, and generates a detailed production plan. Finally, the Prepress department re-enters the production method (again) and combines the imposition plan with content/page files, adds registration and other sheet marks, and performs all other tasks related to imposition. The company is able to handle a modified production method while the job is already in prepress, thus saving additional time.

Williamson approached the challenge much differently than others. Most companies are sending the imposition information from the accounting package. Instead of receiving job specifications from that route, Williamson includes the UpFront imposition planning software to allow them to automatically do more than just imposition. For example, it provides JDF for postpress and other activities. It also delivers customer information, such as company name, the contact, Williamson’s sales person, the name(s) of those responsible for approvals, and other data.

Below is a visual representation on how the imposition object is included into the JDF file structure. The dashed rectangle represents the imposition information that is added when the “Include Stripping Process” checkbox is checked in the UpFront export dialog. *(Paragraph is the property of Creo, Inc.)*



*(Above image is the property of Creo, Inc.)*

JDF Stripping has a potentially dramatic impact on prepress. With the automated workflow that Williamson has set up we can see the following repercussions, present and future:

- The required amount of imposition knowledge required by operators in prepress is heavily reduced. Apart from some initial configuration of pressmarks, there is no detailed knowledge necessary of how FastImpose, the Scope imposition program, works. Although all operators at Williamson’s are already familiar with FastImpose, any future new operator will not be explicitly required to learn it.
- In future and environments other than Williamson, it may be necessary to rethink the competencies of the planning operators and the prepress operators. One of the implications of JDF Stripping is that the information provided from MIS to prepress is reliable. This means that the MIS operator has to be able to make imposition-related decisions. This is not the case everywhere and may lead to prepress operators shifting into the planning department.
- The time at which impositions are made in prepress is also open for revision. Today impositions are made at an early stage of the workflow in prepress. In between the time the order enters prepress and the time it is sent to the press, there may be several revisions of press assignments resulting in changes to the imposition. Because of the time and “danger” involved in making imposition changes,

these are usually executed as soon as possible and involve a revision cycle. If the information from MIS can be reliable and up-to-date – which it should be – the creation of the imposition can be delayed until the moment of platemaking, because the whole Stripping process in Scope takes a matter of seconds.

The degree to which the above repercussions will be felt will differ from company to company, but with the growing importance of management information systems and their use of JDF imposition, prepress as we know it today is a craft that will strongly diminish in importance.

By implementing this system, there is considerable error reduction in prepress, because data is not entered three times. This, of course, also results in reduced prepress operator time.