

# Production Integrated Control of Digital Press Workflow Management Based on Job Definition Format

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## Abstract

*In this paper, basic elements of the digital printing workflow and the Management Information System as well as their relationship are first introduced. Then, the function of Job Definition Format (JDF) is described and analyzed. A mechanism to control all of the processes in production is illustrated in detail based on JDF. Combined with Workflow of map printing, the design and realization of Workflow and management of map printing on JDF is discussed. At last, some theory meaning and technology guiding to construct the Workflow of map printing and management system of map printing are provided on JDF.*

## 1. Introduction

Digital workflow is a system or technology that integrated controls and manages information of graphics and texts and of producing and of controlling throughout prepress, press and post press. Digital workflow integrates various working procedures of printing processing through networks and establishes a digital integrated printing system including prepress, press, post press and processing controlling and managing, which completely and accurately transmits graphics and texts information and eventually makes printing production<sup>[1][2]</sup>.

Main purpose of digital workflow lies that it can resolve traditional printing problem which cannot overcome information transmission and printing integration controlling. Digital workflow can connect various parts well among printing producing and can make producing procession going on fluently, and eventually can

get results that reduces production costs, brings management to completion, extends network printing and increases income.

## 2. Information constitution and mutual relation of digital workflow

There are three main types of information lying printing digital workflow: graphics and texts information, producing controlling information and managing information. Graphics and texts information represents transmitting and copying printing media objects and must be reproduced on printing production as truly as possible, whose formats are PS/PDF; producing controlling information represents information of managing and controlling procedures of entire printing producing, whose formats are PPF/JDF; the last managing information represents other

relevant information including producing organization, valuation, financial affairs, business accounting, cargo movements, management and et al.

Three types of information are related tightly for digital workflow. No PS/PDF graphics and texts information, no information for “flowing”, and so no way for going on producing printing media; no PPF/JDF controlling information unless graphics and texts information, no way for transmitting producing controlling information throughout prepress, press and post press, in which JDF contains information of controlling normal producing. Managing information is also related closely to printing producing. Three types of information cannot substitute for each other. Figure2-1 illustrates relations with each other.

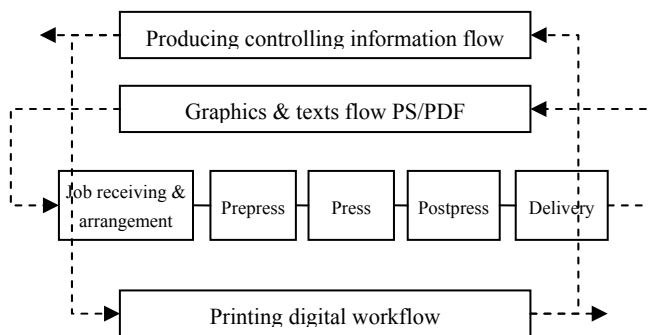


Figure 2-1 Printing digital workflow and information flow<sup>[3]</sup>

## 3. JDF--function of job definition format

JDF is a XML based file format and suitable for MIS (Management Information System) interchanging data format facing application. JDF is compatible with now-existing PPF (Print Production Format) of CIP3 and PJTF (Portable Job Ticket Format) of Adobe<sup>[4]</sup>. JDF combines information description standard with information transmission agreement and provides industrial standard for top to top working specification.

JDF provides a method describing each job throughout printing procession, so that enables users controlling effectively various jobs of each workflow. JDF has two main functions, the

first is processing various information flow for each jobs from start to end; the second is linking MIS with producing devices. It's of capital important that JDF can accomplish these two functions whenever using any tool. Different from job tickets of other workflow, JDF allows for describing all producing procession which may make a production, such as from job issuing to entire job processing. Each step of job will be converted to a "node", tree consisting of these nodes describes entire job. All nodes altogether represent the final production, at the same time; each sole "node" can be defined using input and output.

## 4. Operation mechanism based on JDF and integrated printing control

### 4.1 Operation Mechanism Based on JDF

JDF pays attention to each step of entire digital workflow and looks every job step as a "node", and entire workflow then links these "nodes" into a "tree". Each node has its "input resources" and "output resources", and various data wanted by producing and processing are stored on the node. JDF records "input"/"output" resources and processing data for each job step, so that producing procession may be controlled.

JDF provides "message service" for producing automation as well. In order to trace job status, JDF records running results of each job step. Therefore, JDF specifies structure, grammas and agreement of "information". Devices may exchange and communicate with producing controlling system using these messages, and may interpose each job step by sending message, tracing message, suspending message and et al. Operation mechanism of JDF format is shown in figure4-1.

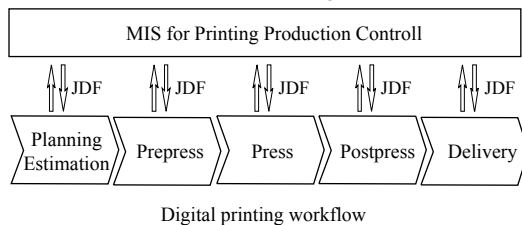


Figure 4-1 Mechanism of JDF format

From above operation mechanism we can see that: JDF can master controlling information of digital workflow in an all-round way and can make full use of information. JDF requires that MIS control entire producing and that MIS acquire messages, process messages, and send messages to "nodes" in real time. We can realize automation producing at higher level. Relevantly, PPF stores only information of "how we should produce", while cannot grasp "what result we get" and "whether or not it's malfunction".

### 4.2 Printing Integrated Control and Job Tracing

JDF allows that MIS controls and traces job, and also allows information services between MIS and producing. While processing single step of job, JDF records the result for tracing. Structure of JDF defines standard information set, all information formats and agreements available for devices carrying out. In addition, JDF provides series abilities of information communication. If a command is selected, controller sends the

corresponding instruction that can break current job, restart current job, or change preferred levels in job list. Besides having communication abilities, JDF also collects executive data for each step and transfers this information to job tracing system using for job accounting system. Figure4-2 illustrates integration and job tracing of printing workflow.

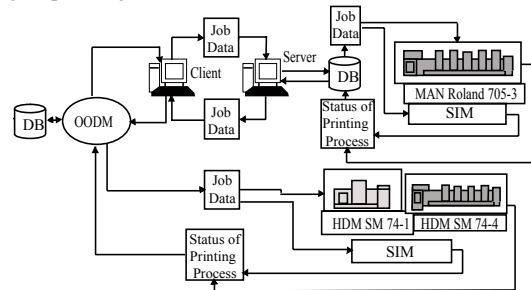


Figure 4-2 Printing devices integrated producing environment and job tracing<sup>[5]</sup>

By way of tracing producing processing, we can overall coordinate order of various jobs and can carry on valuation accounting. Producing controlling system exchanges information with devices which can notify controlling system with information when each step starts and ends and when any device is malfunction. Controlling system can transfer wanted JDF data to devices and devices go on produce according to corresponding resources.

## 4. Conclusion and future

JDF is an advanced job definition format based on network, and provides overall resolution covering entire printing producing and management flow, with which producing controlling can be improved dramatically. JDF guarantees any complex printing job running effectively and smoothly. JDF is sure to be indispensable essential technique for printing digital workflow management controlling with high integrating, opening as well as characteristics of automation and network.

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## Author Biography

Wang Xiaoli received his BS in map printing (1997) in Zhengzhou institute of surveying and mapping and his MS in cartographic and geographic information engineering (2002) in institute of surveying and mapping of Zhengzhou information engineering university. He has worked in this institute for about 10 years since 1997 and now is majoring in graphic arts and GIS.