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Workflow Automation

Basic Concepts of Workflow Automation in the Graphic Industry

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Preface

In this booklet, I am discussing the underlying concepts, models and data formats of *workflow automation* in the graphic industry. I will not present individual or vendor-specific solutions, though they surely have a big impact on the content of this text. That is, I am reviewing industry implementations in general terms – I will not describe workflows in an abstract or mathematical manner.

It is certainly presumptuous to write a book about workflow automation in the printing industry. The field is way too diverse for that. Online printers, transactional printers, commercial printers, gravure printers, in-plant printers, copy shops, wide-format printers and packaging converters, for example, have their own way of producing printed matter. In addition, workflows in the graphic arts industry naturally include additional players, such as ad agencies, designers, publishers, logistics partners, suppliers of consumable, brand owners, and so on. To cover them all would definitely be too much for a small booklet. We are therefore concentrating mainly on workflows in print shops, and to some extent on their direct partners such as print buyers or suppliers of consumables.

Moreover, the need for automation is not the same all over the world but rather depends on labor costs, the local business situation, and quality requirements. That is, I try to describe the state-of-the art concerning the automation of production in the printing industry in general. The actuality in many print shops may differ greatly from this. Moreover, not all products and not all production processes are suitable for automation. Thus, it is not the goal to achieve 100% automation for 100% of products in a print shop. Standard products should be produced automatically, not the very unique one-time jobs.

On the surface, the term *workflow automation* means that everything is cross-linked with everything else, from the creation of the design to the delivered product. Not the automation of individual "production islands" is strived for, but of the overall manufacturing process. Thus, it almost feels like a contradiction if we also analyze small details of parts of the workflow. I therefore would like to ask the reader to always keep the big picture in mind.

The author, drawn by Gojko Vladić during lecture

In practice, this means that the bottlenecks of the current production flow should be identified first. In print production, workflows are improved step-by-step – it is an ongoing process.

I have given lectures on *workflow automation* in recent years and prepared related lab exercises for students at different universities. These students enrolled in programs on printing technology or something along this line. This brochure is a condensed summary

of these activities. Thus, my academic background is still showing through in the content of this publication. I believe, however, that the brochure should also be useful for people working in the graphic arts industry. It helps to understand the relation between different production steps and the intrinsic communication between different components while producing print products.

In Chapter 1, I will introduce the topic of this booklet and define the basic terms that we need in the following chapters.

Chapter 2 is about the scope of workflow automation in the printing industry. In many cases, the term *workflow* refers only to the work steps within production, i.e. in prepress, press and postpress. In this booklet, however, I want to define the term more broadly, which is why I am including areas such as the print buyer's purchase order, materials management, or shipping the finished products to the customer.

In Chapter 3, I present the most common model for print production: the process-resource model. This model is the basis of the Job Definition Format (JDF) that is the topic of Chapter 4. The designation of processes and resources, however, might differ in these two chapters. In Chapter 3, I use terms that are quite common in the industry, while in Chapter 4 I follow the CIP4 organization. For example, in chapter 3, I might denote a resource with paper, while in Chapter 4 I would use the official CIP4 term *media*. CIP4 is a not-for-profit standards association organization specifying data formats for workflow automation (e.g., JDF) in the printing industry. They denote and specify processes and resources so that they are uniformly valid and precise. On the other hand, they are sometimes harder to comprehend intuitively.

Chapter 4 does not only contain an introduction to job ticket formats like JDF, but also other formats such as XJDF and PrintTalk. I explain the basic concepts, not so much the actual coding of these formats. Thus, developers need to study the specifications on the CIP4 website www.CIP4.org (❶) if they want to learn details of coding concerning the data formats.

I do not presume any knowledge of these data formats in order to read this book. On the other hand, I presuppose that the reader is somewhat familiar with the basic procedures in the printing industry as well with the essential concepts of IT technology.

I hope you will enjoy reading this book and that you will find it interesting. Any suggestions, corrections, comments and/or additions would be greatly appreciated. You can contact me at hoffmann@hdm-stuttgart.de.

Thomas Hoffmann-Walbeck

CIP4 ORGANIZATION

Note

CIP4 stands for *International **C**ooperation for the **I**ntegration of **P**rocesses in **P**repress, **P**ress and **P**ostpress.*

❶

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Contents

Abbreviations

AI	Artificial Intelligence
API	Application Programming Interface
B2B	Business-to-Business
B2C	Business-to-Customers
BMP	Bitmap Image File
CFF2	Common File Format, Version 2
CIP3	International Cooperation for Integration of Prepress, Press and Postpress
CIP4	International Cooperation for Integration of Processes in Prepress, Press and Postpress
CRM	Customer Relationship Management
CMS	Color Management System
CSV	Comma Separated Value
CtP	Computer-to-Plate
DB	Data Base
DFE	Digital Front End
DPART	Document Part
DPM	Document Part Metadata
ERP	Enterprise Resource Planning
EXIF	Exchangeable Image File Format
FIFO	First-In, First-Out
FTP	File Transfer Protocol
GPS	Global Positioning System
HTML	Hypertext Markup Language
HTTP	Hypertext Transfer Protocol
HTTPS	Hypertext Transfer Protocol Secure
ICS	Interoperability Conformance Specification
IIOT	Industrial Internet of Things
IOT	Internet of Things
IPTC	International Press Telecommunications Council
IT	Information Technology