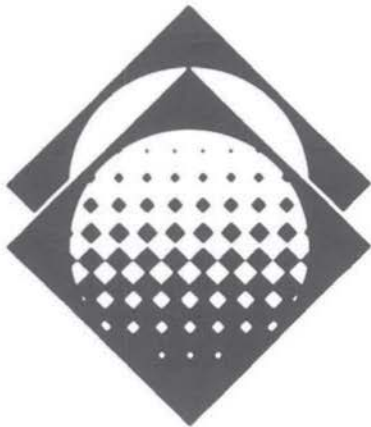1997 PROCEEDINGS

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# A Framework for Digital Data Workflow
# in a Graphic Arts System

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Keywords: prepress, systems, digital, exchange, flow

Abstract: A basic desktop publishing system connects the application or creative operation to an output device via a driver and RIP. As the desktop has become a more credible source of input for graphic arts and production systems, the demands on productivity, quality, expertise and integration with existing processes has grown. One result has been a more elaborate framework for digital processing operations from creation to output, as described in this paper. Along with the proliferation of processing stages has come a growth in commercial opportunities, standardization activities and workflow scenarios. The use and application of this framework are illustrated by examples drawn from existing commercial systems.

## Introduction

In a graphic arts system, a creative source is linked to a production destination. The basic elements of such a system can serve as the starting point for describing the evolution of digital data processing and flow in graphic arts systems. These basic elements are shown in Figure 1, where an application is connected to an output device via a print driver and RIP (Raster Image Processor).

The application is feature-rich editing software with a good user interface for capturing user intent and generating the desired document appearance, which is expressed in terms of an internal format. The driver converts the internal format to a PDL or page description language, such as PostScript or PDF (Portable Document Format). Most high end graphic arts applications have integrated drivers. The RIP converts the device-independent PDL into a device-dependent raster image for the target output device. The output device can be an imagesetter, direct to plate, direct to press, or a laser printer. While the physical medium can influence the overall workflow, this paper will focus on the digital data flow and operations in the system.
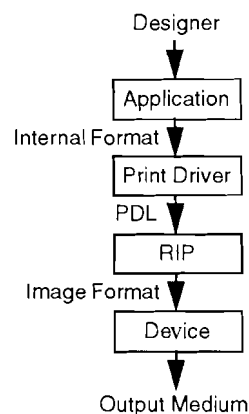
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Figure 1: Basic Framework

Taken together, these steps form the core of a commercial system. Since they precede the output, they are "prepress" operations. Adding the necessary infrastructure, including platforms, networks, storage and databases would turn the framework of Figure 1 into a commercially viable system.

In this basic system, the application is the value added operation. The remaining steps are essentially format converters. They translate and interpret the content choices made by the document designer at the application into formats appropriate to the different stages in the flow. In the progression from application to output device, the ability to modify document content decreases, while data volume and dependence on output device characteristics increase. For example, the application's internal format describes a document compactly in terms of objects, such as lines, figures, characters, images and so on. By comparison, the image format describes the document in terms of pixels that are tuned to the output device's resolution, inks and operating behavior, possibly including compensation for characteristics such as misregistration and tone reproduction.

### Multiple Applications and Outputs

While Figure 1 shows a vertical, one dimensional flow, the system designer has a choice of applications and output devices, depending on the nature of the job, the destination and throughput requirements. The system designer may configure the system to offer multiple applications, with integrated or shared drivers, and multiple outputs, each usually with a dedicated RIP (Figure 2).

The enabler for such a horizontal, two dimensional system is the PDL, usually PostScript, which is the common intermediate format that a variety of different applications can use to connect and communicate with a variety of

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