Best Practices for Productive Variable Data Printing

Erik Laurijssen
Xeikon International
Lier, Belgium

Abstract

Achieving highly productive Variable Data Printing (VDP) at the lowest cost levels is a constant challenge. This is mainly because such VDP workflow systems come with a myriad of configuration possibilities, potential performance bottlenecks and necessary tool choices.

This paper lists a set of very concrete questions that come up in configuring and working with a VDP workflow. For every question asked key parameters are identified and useful and valuable answers are provided as best practices.

What VDP Language Should I Use?

For those companies actively doing variable data color printing work there has surely been no shortage in VDP languages to choose from. This abundance in VDP languages is obviously confusing and consequently harming the digital printing market. What are the differences or when should one choose to employ PostScript Forms, Optimized PDF, VIPP, VPS, FreeForm, BTF, JLYT or any of the other VDP languages? To resolve this question and for many other reasons almost all vendors of digital printing equipment decided to join forces in the late nineties under the impulse of the PODi organization (http://www.podi.org) in an effort to define a truly open industry standard VDP language. The result of this effort is PPML (Personalized Print Markup Language) which is currently at Version 2.1. Vendor adoption has been accelerating over the last years and currently almost all major vendors have effective support for and are advocating use of PPML in their products.

PPML is an XML-based language which allows it to benefit from all inherent advantages of XML. By itself XML is also an open industry standard and it is fair to say XML acceptance, knowledge and tools are multiplying rapidly. PPML can conveniently ride this industry wave and extend it to become an easy to learn, yet powerful VDP language able to guarantee high productivity. All data gathering, cleansing, manipulating, etc. that can be necessary for VDP can be managed and converted into XML streams by VDP authoring tools while taking into account and applying business rules and design or layout rules.

A big plus of PPML over other VDP languages is its independence from any Page Description Language (PDL) like PostScript, PDF, SVG, etc. or from any content format like JPEG, JPEG2000, TIFF, etc. This feature makes PPML ready for any new PDL's or content formats that my surface or for enhancements to existing content formats or PDL's. The content independency also implies that PPML allows separate management of content and the actual document structure allowing cross-media publishing or re-purposing of content. Moreover, PPML also allows to separately manage composition and production issues because production information can be added downstream allowing distributed printing or changing production methods.

PPML is also designed to support fully automated workflow and production processes yielding more flexibility and productivity. Finally, PPML also empowers users to make last-minute decisions on what equipment to use.

With the currently accelerating deployment of PPML the goal of having an open vendor-neutral VDP standard is now effectively materializing. Expect PPML to boost VDP productivity levels and to give rise to new levels of 'super-efficient' workflows not only for VDP jobs used in direct mail or transactional market segments, but also for jobs found in POD or industrial market segments like label printing or packaging.

As an analogy it could be stated that what TPC/IP as open industry standard did for networking in the last ten years can be compared with what PPML can do for digital color printing. Please contact PODi for more detailed technical information on PPML or for excellent general business information on digital color printing. PODi has made available more than 230 well-documented digital printing case studies.

What is the Importance of Global Re-Usable Objects in my VDP Workflow?

Recurrent revenues coming from regularly re-occurring customer jobs are understandably very valuable for most digital color printing businesses. Such re-occurring jobs have a lot of potential for automation and can therefore benefit from related cost-savings yielding better than average profits. These jobs also more often than not have content that can and will be re-used within the same job or over multiple periodical runs of related print jobs. In such cases content that is RIP-ed once and that can be re-used over jobs (global re-usable objects) and over time will introduce significant set-up time and cost savings. Such shorter job preparation allows printing to start faster while job automation can provide more reliable workflows that help avoid corrections or re-runs. Hence using global objects in recurring work is a powerful means for improving profitability.

Global objects can be managed in many ways. The most potent implementation is an architecture where these global re-usable objects can be stored, accessed and managed anywhere on the network, giving customers freedom of choice in their workflow and IT infrastructure set-up. A global objects management console should be able to centrally activate, de-activate, backup, restore, and control multiple versions of environments that contain global re-usable objects.

Digital front-ends (DFE) that control digital color printers can be given online access to global object repositories on the network. Through the use of such global object strategy many synchronization and versioning problems can be solved elegantly. Also companies who have multiple geographically distributed sites can benefit from splitting preparation or pre-press work and actual printing through exporting and importing print resources on servers worldwide.

How Can I Speed Up the RIP-ing Process?

Although RIPs benefit from Moore's law which states that computing power doubles every 18 months, still RIPs can continue to be now and in the foreseeable future a bottleneck in digital color printing. Jobs become more complex, printers get faster and resolution gets higher. These trends offset the ever increasing computer power available to RIPs.

Next to intelligent caching algorithms for PPML (or other VDP) workflows and use of global re-usable objects other strategies exist to beef up RIP processing. The two most important are the ability to start printing a job while later sections of the same job are still being RIPed and RIP load balancing. While the former is an excellent solution in many cases there is the drawback that preparation work can not be done upfront. For high-end production environments it can make more sense to manage all preparation work including RIPing upfront before submitting jobs to production for printing. In such cases RIP load balancing is a good way to speed up the RIP process. In the latter scenario multiple RIPs each running on their own CPU are coupled together and act as one virtual RIP. A software component splits up jobs over the available RIP processors and recombines the RIPed data afterwards. Xeikon measured near linear performance improvements when CPU's that run RIP software get added to the system.

What Are the Advantages of Post-RIP Imposition for VDP?

Printing VDP jobs requires specific imposition templates and engines. Well known non-VDP imposition schemes (2-UP, 4-UP, saddle stitch, etc.) need to be adapted or extended for VDP jobs. Take for example the number of possible combinations when printing VDP-cards on a sheet: Left2Right, Top2Bottom, ThroughStack, etc. It becomes even more complex when records of a VDP job have more than 1 page or when every record could have another page count. In such cases sophisticated imposition engines are needed that can handle the complexities associated with printing VDP jobs.

The imposition step could traditionally be per-formed on the source data before the RIP process. This means fully imposed sheets are sent to the RIP. A first drawback of this workflow is that re-occurring images or pages will have to be RIP-ed as many times as they appear on the sheet. This workflow is also less flexible when it comes to late minute changes. Minor changes can cause the whole job to be re-RIPed.

In contrast a lot of flexibility and hence productivity can be gained in a workflow where the imposition step can be performed on actual RIP-ed objects or pages. Post-RIP imposition enables to combine RIPed sheets, pages or even objects just before sending the data to a printer. This step can be performed in seconds and the advantages of this method are legion: objects will only be RIPed once, late minute changes don't require a restart of the complete job, the same job can be printed on different digital printers using different imposition schemes and it is a key capability for solving VDP imposition problems in a production environment.

Xeikon Workflow Solutions

Over the last 12 years Xeikon gained unique experience in high-end digital color production environments. Backed up by valuable customer input Xeikon recently introduced a new generation DFE, called the Xeikon X-800. The X-800 is the first truly open, scalable and modular DFE that also supports PPML V2.1, global re-usable objects, powerful post-RIP imposition features, RIP load balancing and job tickets (including JDF). The X-800 is designed to function equally strong stand-alone as well as in a fully integrated and automated workflow. Companies having multiple Xeikon digital color printers will benefit from a comprehensive X-800 DFE based solution for managing their complete digital printing environment.

Biography

Erik Laurijssen is Vice President, Front-End Systems Group, at Xeikon International. After obtaining a Masters degree in engineering from the University of Leuven, Belgium, he has built up 16 years of experience in leading international businesses that develop, support, market and distribute complex high-end software products. The last 6 years he has been leading the Front-End Systems group of Xeikon International.