# Enablers for Advanced Digital Print Applications

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## Abstract

Production digital print applications have become more and more advanced. This evolution is driven by several enabling trends in the industry, including: technological developments in printing technology, increased standardization and workflow automation. Next to these factors also demand for more advanced print applications is growing, driven by one-to-one marketing trends and considerable amounts of consumer and customer information that is being gathered. Still, for the market for advanced applications to take off, one extra factor is required: the ability to integrate all the different enablers into working, successful applications. This is done by a data integrator. This paper discusses the different enablers, and demonstrates with commercial running applications what the importance of this data integrator is.

Following the recent developments in digital print technology, the standards involved and overall workflow automation, production digital print applications have become more and more advanced, both from a technological point of view as from a market and applications perspective.

## Advanced Digital Print Applications

We know the typical features of digital print: short run, on-press collation, print-on-demand and variable data. And for the last 10 years, these applications have been evolving. Through a combination of enablers that surfaced the market, a new breed of faster, more complex and more intelligent applications has emerged. Typical for these advanced print applications is their need for:
- fast processing and communication capabilities,
- high degree of automation with minimal manual interaction,
- input of 'intelligent' information, to be integrated in the publication, and
- standard interface rules for distribution of projects across platforms and systems.

These requirements have been addressed through a series of critical enabling factors.

## Enablers

### Technology
*Printing Presses and Finishing*

During the past 5 years, digital print technology has matured and a lot of new developments have gone into the digital front-ends (DFE) that drive the imaging systems.

Most obviously raw processing speed boosted. E.g. average RIP (Raster Image Processor) times were reduced from several minutes to a few seconds only.

The latest versions of DFE systems offer many more added value production features as well, including on-RIP color management and on-press impositioning. Both features reduce the burden from the core prepress system and operators.

*Prepress*

Recent developments in prepress technology include:
- increased processing power and data throughput and bandwidth,
- extended standard functionality,
- affordable technology, even at the high-end,
- new innovating software solutions for niche applications (such as variable data processing),
- workflow integration, scripting and automation, and
- custom solution developments.

This results in more powerful but flexible prepress systems, and integrated custom solutions where needed.

### Standards
*Postscript & PDF*

Next to the transactional printing standards (such as AFP), PostScript has set the standard as the general page description language for output.

Build upon Postscript, Adobe developed the PDF format to allow for device independent editing, viewing and outputting of documents, which has become the 'de facto' standard in commercial print and document publishing markets. However, PDF showed not to be the optimal format to handle dynamic content.

*XML*

XML (Extensible Markup Language) was derived from SGML and designed to offer a solution for high

volume data publishing. Nowadays it is becoming increasingly important in exchange of a wide variety of data over the many different media available for communication.

### PPML

PPML (Personalized Print Markup Language), developed by the Print On Demand Initiative (PODi) in cooperation with all major digital output device and DFE suppliers, is using the basic XML object-based structures. PPML integrates reusable objects, eliminating the need for a device to resend data that was already send before. Moreover, PPML manages the required resources throughout the print process. As such, they can be uncoupled from the actual print job, providing efficient and streamlined data transfers, even for the highest print production volumes.

### SVG

The SVG (Scalable Vector Graphics) format allows for the creation of dynamic objects, using XML structures to describe the graphical objects and their behavior. It works on vector and bitmap based images, and allows for complex nesting of different objects into other dynamic objects.

### Market Trends

A driving force behind the emergence of advanced digital print applications is of course the demand for more intelligent, more efficient communication on paper. Several market trends drive this demand: 1-to-1 and B-to-B marketing (demanding an individual, targeted approach), increase in customer knowledge gathered through CRM (Customer Relationship Management) and dedicated 'intelligence brokers', and a growing media portfolio, requiring a rational management of the media mix.

## The Data Integrator

### The Missing Link

And still, the advanced digital print applications did not emerge in large quantities yet. One crucial link is still missing in the process of integrating the complex data into advanced layouts…

Much as a photographer who will combine his unique expertise in shooting the right image to be printed, with his knowledge about printing and feeling for marketing, a data integrator is required to add his expertise on data management and manipulation to his knowledge in printing and feeling of marketing communication.

Today, only a handful of data integrators exist in the way we describe them, thus limiting the further emergence and development of advanced digital print applications.

## Some Real-Life Cases

### Lottery Tickets

A customer required 17 million lottery tickets, each customized with a unique code. The code was customized using 6 colored squares, each having one of 5

colors and one of 5 symbols. This visual representation was required for a related television show.

The data integrator converted the original database of lottery numbers into a list of color combinations. He then defined the 5 colored squares and the 5 symbols as individual objects. Using PPML code, he was able to create continuous streams of data, reusing the 10 different individual objects for the series of lottery tickets.

### Route Description

A bank company wanted to promote its on-line banking services to non-active customers, in a folder mailing including a description on how easy it is to do your banking at home on your PC, and a tedious description and a map of the route that the individual customer had to follow to get to his local bank office.

There were no reusable objects, and the challenge was to generate the thousands of route description and maps in time to feed them into the appropriate mail piece, in-line with the printing process.

### Image Library Publishing

A security company did a mailing with the looks of a threatening letter, stating in torn paper snippets: "Mr. Xxxxx, we keep an eye on you!" Snippets (about 200 in total) of several character sets were photographed and stored in an XML database. A PPML program placed the required snippets in the layout, randomly, and adding scaling and transformation

In total about 200 images of character ( and character combination) snippets were photographed and stored in an XML database structure. Using a PPML program, the XML library of snippet objects was addressed to bring on, in random scaling and rotation the appropriate character snippet.

## Conclusion

To conclude this brief overview of the different enablers for advanced digital print applications, let us take a look at what else we can expect in the future.

Short-run gets shorter. And traditional printing technologies will further succeed in lowering their setup costs. As such, pressure on current digital press owners to look for alternative applications increases.

Customer intelligence becomes 'common' as a source for databases. The information being gathered about each of us, even on a European scale, will further grow.

The need for differentiation in marketing communication will further increase.

Digital printing technology will offer good quality at fair costs in higher volumes.

New technology will further streamline the prepress and DFE processes, at faster speeds and lower costs. In addition new tools will be develop to handle more specific advanced digital print preparation requirements.

The importance of the data integrator as an independent solution provider will increase, and more will fill the current gaps in between customers, marketing agencies and printers.

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## Biography

**Steven De Schamphelaere** has worked for 5 years with Xeikon N.V. as Product Manager and Manager Strategic Planning. In 1999, he joined the start-up of Triakon N.V., now one of Belgium's leading digital color print centers.

Early 2002 he was the founder of Realm( ), gathering a team of high-level experts in the domain of advanced and intelligent digital print solutions development. Realm( ), working worldwide, has successfully implemented already a wide variety of advanced digital print applications in different markets.

Mr. De Schamphelaere is also senior consultant of Magi Associates, an independent association of industry consultants who focus on development and implementation of innovative digital print and publishing solutions.