

Digital newspaper printing

State of the art, use cases, business models and outlook



A flashlight-report prepared by:

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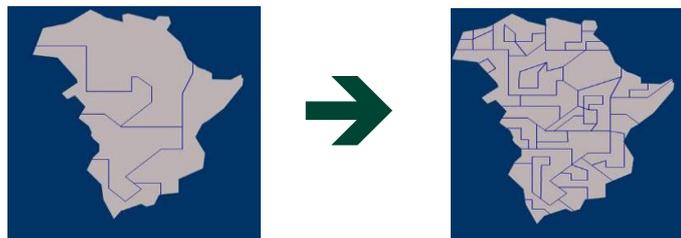
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This Kirchner + Robrecht flashlight report does not claim to be exhaustive. The document summarizes developments and circumstances of digital newspaper printing and provides a rough orientation in a rapidly changing environment that is influenced by the digitization of the publishing industry and technological developments in machinery. This report gives a basic understanding of today's and future key success factors when applying digital print in the newspaper sector. In addition to general information about the technology, various application possibilities, potential manufacturers, practical usage and economic matters are pointed out.

1. Situation

At first glance, digital printing is completely unsuitable for newspaper production because the business model of digital printing is diametrically opposite to newspaper printing. However, newspaper production parameters and demands are changing and therefore the use of new technologies gains relevance. For advertisers, newspaper publishers offer two classic ways to reach potential customers: printed ads or insertion of brochures etc. in the main paper. In addition to



*Illustration 1:
Regionalizing is very important for daily newspapers*

regionalization of inserts, ads and news, publishers could also provide individualized content and advertising. As a rule, newspapers see themselves less and less as a mass medium and strive to respond to individual needs and interests of readers and advertisers. Modern technologies (CRM systems, digital platforms, digital printing) and sophisticated direct marketing are critical success factors.

In principle, digital printing makes it possible to create an individual newspaper every day for each subscriber. This individual newspaper can take into account wishes and interests of the individual reader (no cinema program, sub-regional content, selected stock quotes, own "letters", etc.). It can also be adapted to the client profile (age, gender, location, interests, etc.) following parameters from publisher and/or advertiser.

Digital printing has been existing for several decades. Performance and quality of inkjet printing has increased continuously since Scitex presented a first inkjet roll-printing machine in 2000. Quality has reached the level of coldset, depending on which speed and material is used.



Illustration 2: Individualization versus mass media

2. Digital printing technology

Digital printing refers to a group of printing processes where the image data is directly transferred from a computer to a printing machine. At Computer To-print (CT-print, see Illustration 3 on the right) the printing process takes place without the use of a static print form. The CT-print process is the heart of this report. Essentially there are two digital printing technologies:

1. *Electrophotography* (laser printing with toner from photosensitive erasable OPC drums)
2. *Ink-jet* printing (applying ink/dyes directly on the substrate)

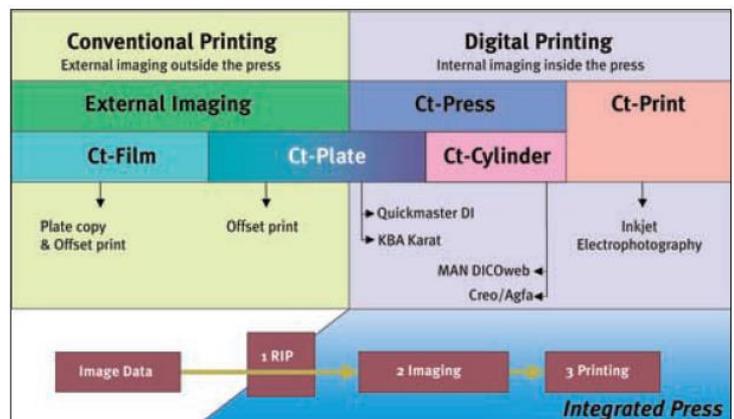


Illustration 3: *Digital printing and Ct-Print as defined by Ifra Special Report 3.32*

Electrophotography is also known as Xerography. It has its origins in the first photocopier from Xerox in the 1930s. Applications of electrophotography mainly evolved in office environments. Additionally low-end electrophotography systems for private customers became relevant at the end of the millennium. High-end digital printing established itself in the printing industry with the IPEX trade fair in 1993. Over the years, it became clear that non-impact inkjet printing has advantages at higher volume and fast production speed. Hence Laser printing and other digital printing processes¹ are less suitable for newspaper production.

Inkjet printing can be divided into two major subgroups:

1. The *Drop-on-Demand*-(DoD) procedure generates ink droplets as needed and makes use of thermal Bubble-Jet or mechanical Piezo technology. Modulation of the droplet size at 600 dpi creates sufficient print-quality with both technologies. Currently the DoD method reaches a maximum web-speed of approximately 2.5 m/sec with Piezo technology and 5 m/sec using Bubble-Jet. The life-time of Piezo print-heads is higher than Bubble-Jet heads.² Pigment inks and dyes can be used with Piezo DoD.
2. Very high print speeds of up to 15 m/sec can be reached with the *continuous flow principle*. A continuous, uniform droplet stream is used. This stream is distracted by electric fields, so that ink droplets reach the print substrate or fall into a recycling container. The droplet size (currently 3.75 pico-liter) however cannot be modulated depending on image-content like with the DoD-processes. The continuous flow principle is very fast but it limits the possible resolution and image quality.

Some manufacturers use a so-called "bonding agents" as a primer during printing on newsprint. This liquid substance is applied by means of using an additional print-head before printing color onto the rough paper surface. The primer seals the porous and absorbent paper surface. However, it is not fully, but selectively applied on the areas to be printed. In this way, the actual ink and primer consumption is minimized. Color saturation/quality is higher and costs are reduced. Drying of the fresh printed web usually takes place by means of infrared radiation or hot air.

¹ Magnetographic, Elcography, Termal sublimation, Ionography etc.

² Life of Piezo print-heads reach approx. 2 years

Let me summarize the significant advantages and disadvantages when comparing digital newspaper printing and conventional coldset newspaper production:

Advantages of digital printing	Disadvantages of digital printing
Variability of the content/products	Nearly linear rising costs for large volumes (quantities and printed area/pages)
Low costs for small quantities	Very high ink/dye costs (Inkjet) restricting color
Low waste	Low page capacity of one production line (web-width, slow speed)
Short make-ready time	High investment costs
No printing plates needed	Quality problem with some (cheap) material combinations
Significantly fewer (skilled) personnel is required	Sophisticated data management required
High format flexibility (section length and when changing paper also the width is variable)	Recycling issues with some dyes/inks
Flexible page count and book structure	Machines become quickly outdated due to rapid technological developments
Tendency to have less paper/weight and more relevant content	
Better customer image despite recycling problems	
Lower paper and transportation costs due to thinner tailor-made products	

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