Newsprint-on-Demand

The cost of digital printing in newspaper production

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2005

STFI-PACKFORSK

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The Cost of Digital Printing in Newspaper Production

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Report no.: 111

a report from STFI-Packforsk

Acknowledgements

The results presented here are part of the Newsprint-on-Demand Project, funded by Vinnova and managed by Erik Blohm, STFI-Packforsk. The project is co-funded by the Digital Printing Community Research Programme, funded regionally by the EU. This programme is managed by Marianne Klaman, STFI-Packforsk.

The funding organisations are gratefully acknowledged.

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1 Summary

This report gives a brief overview of the costs associated with digital printing in newspaper production.

When purchasing a digital printing press, it is undoubtedly important to consider the expected monthly volume to be able to achieve the lowest production costs. It is also important to realise that the purchasing price is only one of several costs that are incurred during the period of ownership of a digital printing system. Due to the fact that manufacturers have their own deal, printing costs can be reduced by using the machine in the most efficient way.

The conclusion to this study is that there are only small differences in printing costs among the different xerographic digital printing systems, if they operate at a proper production level. However, when comparing two relatively equal printing presses for inkjet and xerography, the difference in production costs is substantial. Production costs for inkjet digital printing equipment is approximately 30% lower than for xerography digital printing equipment.

2 Introduction

The distributed printing of newspapers is an evolving market, with many different business models ranging from large-scale production using Océ Variostream, for example, to small-scale on-demand production, with regular xerographic printers, e.g. Satellite Newspaper. However, it seems that the market today is small and primarily directed at specific market segments, such as business travellers. When studying systems, where traditional newspaper production technology such as offset is replaced by digital printing, cost is a crucial factor (Mejtoft, 2004).

All current established systems for digital printed newspaper production utilise xerographic technology. High-speed inkjet is a new and emerging technology that could be used to lower production costs when using digital printing. When discussing digital printing in relation to offset, the big advantage for digital printing technology is that the start-up cost, set-up time and discarded start-up copies are much lower than for offset. This makes it possible to begin printing almost immediately and this, without waste.

An investment in a digital printing system is usually a very big strategic and financial step for a printing company. The immediate cost usually considered is the purchase price of the printing system. This price can differ a lot among different manufacturers and different systems. The purchase price is unquestionably very important, but it is only one aspect of the total production cost. There are many hidden costs, such as high prices on consumables or service fees. The business models used by the digital printing equipment manufacturers make it important to consider all costs associated with the printing process, before deciding what equipment to use.

This study is based on prices and costs given by dealers of the printing systems without any discounts or other special offers that might apply. All prices were gathered from dealers in Sweden in May, 2005, except for RISO HC5000, when the price was obtained in November, 2005.

2.1 Objectives

The objectives of this study was to give an indication as to how the actual costs of printing newspapers with digital printing technology differ from the costs associated with offset technology.

The costs considered in this study are only those associated with the printer, thus excluding any additional costs such as a pre-press and the building of a system for handling the data-flow when choosing to customise the newspapers. Additional revenues for customised advertisements or advantages in distribution have not been taken into consideration either. This study is therefore not a complete total cost of ownership analysis, in the actual meaning.

Due to the design of different printing systems and the fact that manufacturers practice different business models, it is important to note that the information given here should be considered merely as an indication of the costs for different types of printers rather than the actual costs.

3 The Cost of Digital Printing

Here, costs have been divided into fixed costs and variable costs. Fixed costs include the depreciation cost of the investment and the fixed monthly costs, e.g. service fees and similar charges.. Estimated costs for workspace and operating staff for the printing system are also included. Those costs that are not included are the administrative and distribution costs for the finished work as well as storage costs for consumables and finished printed products. Variable costs take in consumables, e.g. toner and ink, together with variable costs associated with each print made with the system, e.g. click cost, where applicable.

The following fixed and variable costs have been included when calculating the costs for printing using the different printing systems.

- Purchase price (depreciation costs) and installation fees (if applicable).
- Fixed monthly maintenance and support costs.
- Variable maintenance and support costs.
- Costs for inks and other consumables.
- Direct labour costs.

The cost per print has been calculated as a function of the number of prints on a monthly basis, as follows:

$$\text{Cost per Print} = \frac{\text{Fixed Costs}}{\text{Number of Prints}} + \text{Variable Costs}$$

This model implies that costs will decline in relation to the number of prints made during a monthly period. That is to say that the estimated monthly volume is an important factor to consider, when deciding on a printing system. A presentation of the productivity, the time it takes to produce a job (depending on the length of the run), is shown in a later section where there is a better representation of the different usage areas for the different printers.

3.1 Fixed costs

When it comes to fixed costs, the cost per copy is dependent on the total monthly volume of the equipment. A high-speed digital printing production press, e.g. NexPress 2100, has a speed of approximately 2100 A3 copies per hour in 4-colour duplex, which comes to over 400000 copies per month, based on an 10 hour daily shift and 20 productive days per month. At this rate, the depreciation cost per copy is a small fraction of the total cost per copy with a digital printing press (*Figure 3*).

Investment costs for all printing systems have been calculated with depreciation over a 5 year period.

3.2 Variable costs

When it comes to digital printing presses, it is expected that one person is needed to operate the press all the time and, therefore, the cost for direct labour becomes dependent on the printing speed. The faster the press prints, the lower the cost for direct labour per printed copy.

For the Xeikon press, there is a click cost, i.e. cost per imprint for each unit area. This remains the same whether duplex prints are made or not. Xerox has the same system for their copy-printers, where every printed page is counted as a click, independent of the coverage of the print and the page format. A duplex is accordingly counted as two clicks. Other manufacturers, such as HP and NexPress, do not apply this kind of business model.

The basis for comparison was a colour print (4 + 4 colours) of 16 A3 (297x420 mm) sheets that approximately comprise a 32 page newspaper. It was assumed that a printing system had been bought and that the business model included a monthly service and maintenance contract to ensure a high level of reliability for the printing system.

3.3 Presses

The following printing presses represent a selection of equipment, covering different printing technologies, speeds, and intentions of use.

- Xeikon DCP 500 D
- NexPress 2100
- Xerox3535 – colour and b/w
- Xerox DC12 – colour and b/w
- RISO HC5000

Since printing speeds differ quite a lot and printing presses are constructed to deal with different monthly volumes, the best way to compare costs among the various presses is to calculate the cost, based on the volume printed on a printer per monthly period. Different manufacturers, however, calculate their costs in different ways, which makes it difficult to make a completely true and accurate comparison among them. Consequently, the costs calculated in this report should not be regarded as absolute facts but rather as trends.

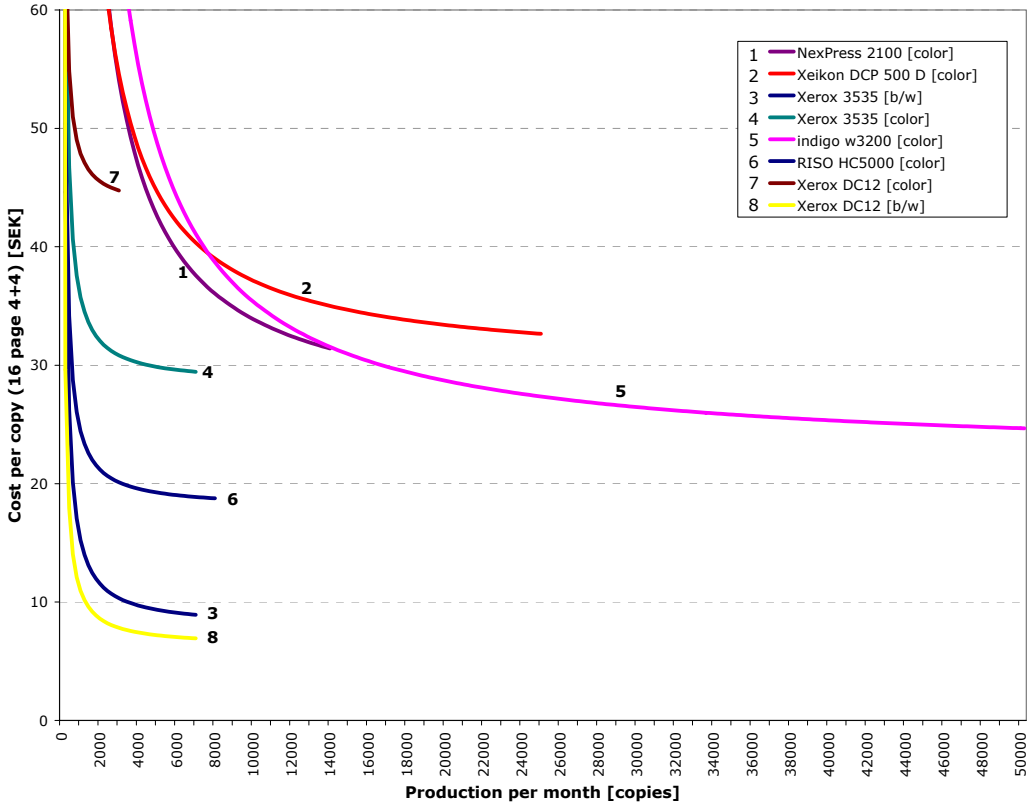

Figure 1. *The cost of producing a 32 page (16 sheets) newspaper in A3.*

In *Figure 1*, the cost of producing a 32 page (16 sheets) newspaper in A3 is shown. The various presses produce different monthly volumes, depending on their productivity. The above graph ends at the point where the maximum monthly production volume was reached.

As an example, for a monthly production of 10000 copies, three presses are available, viz. the Xeikon DCP 500 D, the indigo w3200 and the NexPress 2100. The costs for this volume, when comparing these three presses, are quite similar, being approx. SEK 37, SEK 35, and SEK 34, respectively.

3.4 Analysing the costs

To obtain a better overview as to how a total cost was broken down into fixed and variable costs, it was divided up into its subparts. The example below was carried out for Xeikon DCP 500 D.

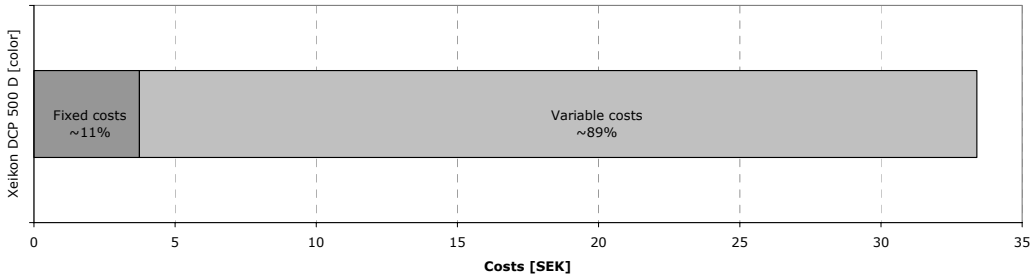

Figure 2. *The cost of producing a digital printed newspaper divided up into fixed and variable costs.*

If a press is in regular production on a 10 hour shift, 5 days a week, the fixed cost is approximately one tenth of the total costs and the variable cost is nine tenths of the total costs (*Figure 2*).

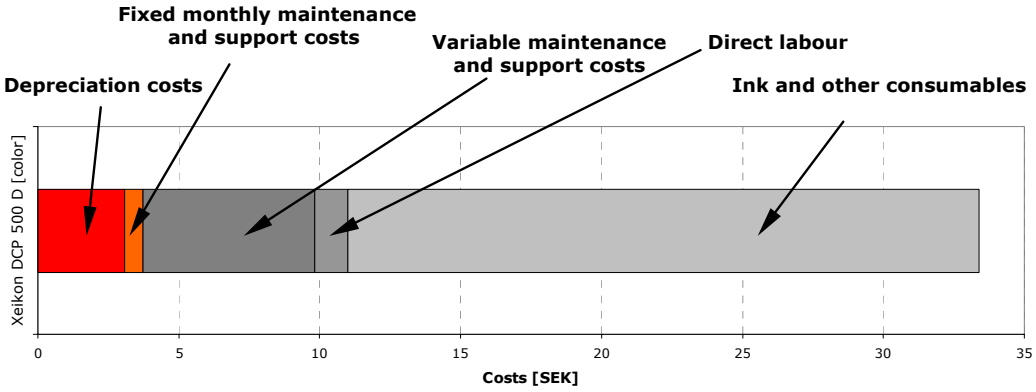

Figure 3. *The cost of producing a digital printed newspaper divided up into different costs.*

If the variable costs are divided up into subparts, it becomes clear that the largest part of the costs is for ink and consumables. They represent approx. 70% of the total costs (Figure 3).

3.5 Comparing xerography and inkjet

Current systems for on-demand printing of newspapers, such as Satellite newspaper, utilise a simple xerographic printer or copy-printer. In this example, the costs are compared between two quite equal copy-printers, viz. a Xerox 3535 and a RISO HC5000. The major difference between these two is that they use different digital printing technology. The Xerox 3535 uses xerography to print and the RISO HC5000 uses inkjet to print.

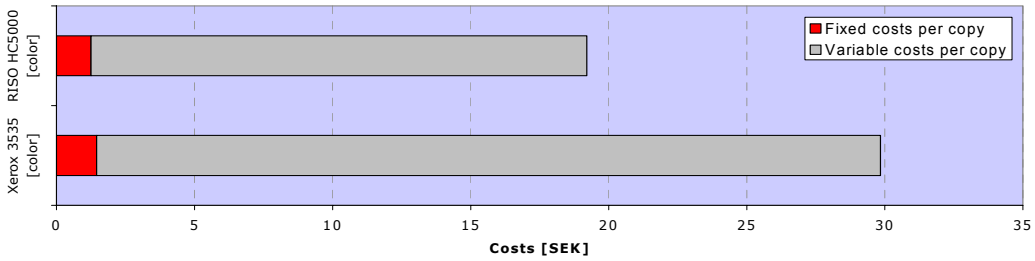

Figure 4. *Costs of printing a newspaper on a RISO HC5000 as opposed to a Xerox 3535.*

When comparing speeds, the RISO HC5000 (57 4 + 4 duplex A3/minute) is quite faster than the Xerox 3535 (9 A3 4 + 4 duplex/minute).

The cost of printing on the RISO HC5000 in *Figure 4* is based on a 20% coverage on 16 A3 4 + 4. The total cost of printing with inkjet when compared with xerography is approx. 30%-40% less. This is due almost exclusively to the lower variable costs.

3.6 Comparison with offset

The cost of producing a newspaper on a xerographic digital printing system like Xeikon or Xerox 3535 (Figure 2 above) is around SEK 30. If this cost is compared with the cost of printing using offset, the breakpoint where it is more economical to use offset production for the edition is about 180 copies (*Figure 5*).

As described above, a shift from xerography to inkjet lowers the costs by approx. 30%. Since the cost of producing a specific edition with offset is not linear (Figure 5), this reduced cost gives a much bigger shift in the breakpoint to approx. 300-350 copies. The conclusion here is that a reduced cost with digital printing shifts the breakpoint between digital printing and offset much more than the reduction in cost.

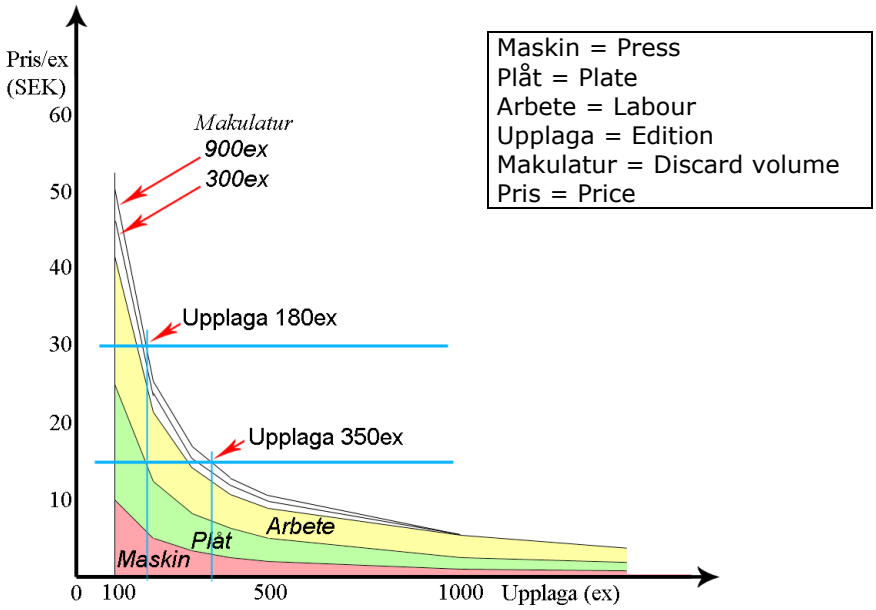

Figure 5. *Cost of offset in small editions (Norstedt-Moberg, 2004).*

Since there are fixed costs associated with every run on offset, the cost does not decline linearly. This makes it very advantageous to print longer runs on an offset press. However, on a digital printing system, the cost per copy is stable on the same level, irrespective of how many copies that are printed of an edition.

The difference between offset and digital printing is that, when working with digital printing, it is possible to change every printed copy. Except for the possibility of customising a newspaper for the reader or a group of readers, other advantages, e.g. the easier handling of distribution, must be taken into consideration when deciding on digital printing as a production technology for newspapers.

4 Productivity

Depending of the length of a specific run, the printing speed may be a crucial factor. The various printing systems have very different printing speeds, which is critical when calculating the cost of printing. Many fixed costs, such as direct labour, are dependent on the productivity of a printing system.

In *Figure 6*, the printing speed has been taken into consideration when illustrating the time it takes to produce a job of a specific run-length on the different printing systems.

Printing speed is not the only thing that is significant when it comes to the productivity of a printing system. The make-ready time is also a factor that has to be taken into account. In the case of a digital printing system, this time is close to zero, which makes it ideal for a shorter run length.

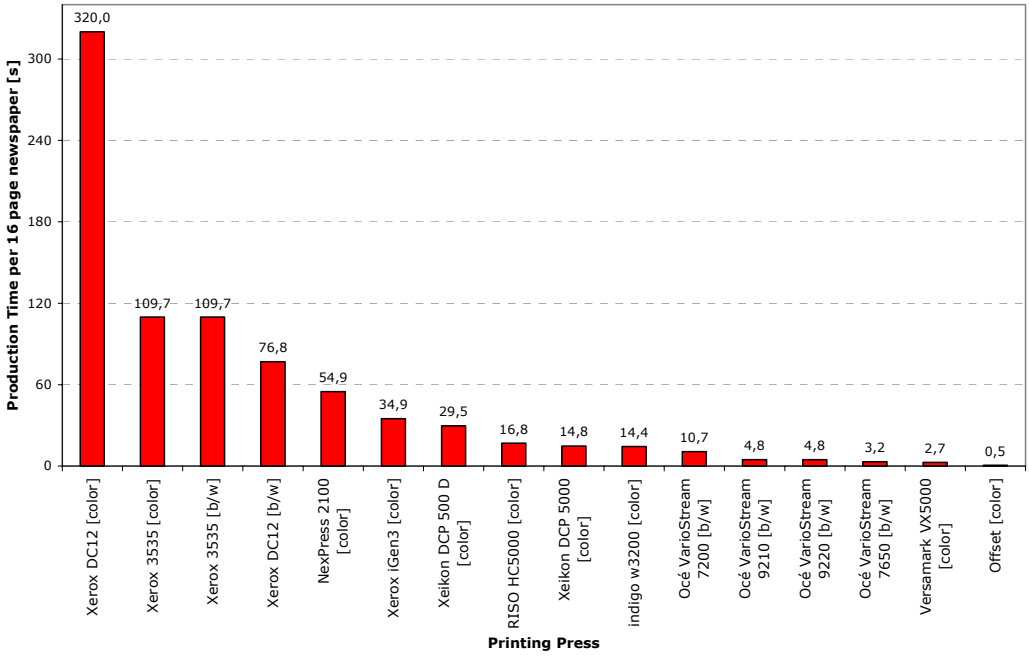

Figure 6. *Time to produce a 32 page (16 sheets) newspaper in A3.*

What differentiates these printing systems from ordinary offset systems is that it is possible to individually change each print during a job.

5 Conclusions

This brief study indicates the cost of printing in different digital printing systems. However, to obtain a complete picture of the total costs of the printing, it is important to understand the associated costs. These may, for example, be costs associated with building and maintaining a workflow for different types of printing, e.g. variable data print.

The costs of the various printing systems, ink, consumables, service fees etc. are costs that vary all the time. During the last period, there has been a quite substantial reduction in price for ink and consumables.

Even if a certain digital printing system has a higher purchasing price, the total costs of the printing system may be lower, assuming that it includes a faster printing speed and lower costs for consumables. If utilisation of the system is greater, it could be more profitable to buy a faster high-volume system.

It is undoubtedly important to choose a digital printing press that is properly suited to an expected monthly volume. It is also important to realise that the purchase price is only one of several costs that will be incurred during the time of ownership of a digital printing system. Due to the fact that different manufacturers have their own deals, printing costs can be reduced by using the machine in the most efficient way.

When buying digital printing equipment, it is essential to consider the compatibility of individual pieces of equipment with the already existing equipment. Due to the different printing speeds, the printing presses are disparately suited when it comes to the present and future production level of a particular company.

This study has calculated the printing costs for three smaller copy-printers. Digital colour copy-printers are less expensive for smaller volumes. On the other hand, they have a very low printing speed and they are often unable to handle a monthly volume that exceeds 20000-30000 prints.

The conclusion to this study is that there are small differences in printing costs among the different digital printing systems that use xerography. A comparison was made between inkjet and xerography. The cost of using inkjet was approximately 30% less than with xerography. This was mainly due to the lower variable costs of inkjet.

The most important thing to consider when investing in digital printing equipment is to find a system that can be integrated into a particular company, as seamless as possible, and find a supplier with a business model that suits that company.

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STFI Database information

Title
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Keywords
digital printing; newspaper; business strategy

Classification
1259

Type of publication
STFI-Packforsk Report

Report number
111

Publication year
2005, December

Language
English