Report to NGU

Digital print

The printing unit of a modern digital printing machine

A modern printing machine – the number of printers is most likely to please the visitor

Introduction

The assignment

The NGU board meeting in Helsinki December 9th to 10th decided to appoint a working group on digital print to follow up discussions at the Union meeting in June 2015.

The Working Group prepares brief chapters on:
• Digital printing - technology and industry development
• Organizational and contractual relationship in digital print - status and experience in NGU unions
• Recommendations on how organization, agreements and any other relevant challenges in digital printing can be followed up in the individual union, possibly under the auspices of NGU and UNI-Europa Graphical.

Members of the working group:
Kim Jung Olsen – HK/Privat – Denmark
Magnus Leoson – Gsfacket – Sweden
Heino Veli-Pekka – TEAM – Finland
Niels Edvard Killi – Fellesforbundet – Norway

The working group met in Copenhagen 18th to 19th February 2016 and visited DRUPA in the period 1st to 3rd June 2016.

Part I - Print in the 21st century

The traditional printing methods letterpress -, lithographic offset -, gravure -, screen – and flexographic print – analogue print – have been augmented with a wide variety of digital printing methods. This has led to print work being transferred from traditional print to digital print, but has also led to changes within traditional print.

The working group has arrived at the conclusion that it is not possible to consider the one without taking into account the other. The report will focus on digital print but will have to also consider traditional print on occasions.

Traditional print is under considerable pressure from different sources. This report will not consider the competition between digital and print as carriers of information. But will suffice to state that this competition results in a diminishing demand for printed material.

A modern graphical work flow will include all aspects of printing. The decision on prining method will be made depending on the work to be done and the possibilities for the printer.

In many printing establishments a worker will operate both digital printing machines as well as analogue machines and in addition to this also prepress and post press work. The nescessary skills in order to perform such work will involve elements of printing, prepress and post press skills. The working group will not draw any conclusions regarding this, but will recommend that questions regarding skills and education be considered by each union. As education systems and labour markets are different this will be a work to be performed in each country. As an example and case study a report for the Norwegian social partners is attached to this report.

In small and medium sized printing plants we can see a larger integration of processes. Each worker will have less specialisation, as all work to a larger or smaller extent will be performed by everyone. In this manner the traditional way of dividing the printing processes in pre press, press and post press with each of them having their own trade and skills will be less important.

A more widespread use of combined machines must be anticipated. E.g. litho offset machines or finnishing equipment with additional digital print units for personalisation etc.

As will be seen in this report, the traditional graphical industry meets different challenges. One of the challenges is not based on printing technology but organisation, workflow and how the printing business is carried out.

Print in the 21st century – in short

Printing is evolving with radical speed. The main drivers of this change are (in no particular order):

Technological drivers

- Inkjet-printing: even faster and better quality, more uses
- UV-leds: faster ink drying
- Software: more fluid work-flow and customer-participation (web2print)
- Laser-cutting: more possibilities for package design
- Robotics: less manual work is needed, more machine-to-machine interconnectivity
- Nanography: "digital printing, offset quality", maybe it works after all
- 3D-printing: a new side-path to follow

Business drivers

- Smaller and more diverse printing jobs
- Less time to print
- Smaller share of printing jobs from news media, bigger share from marketing

Together these drivers have a major effect in the printing. What is possible and profitable, that is the question:

Possibilities

- More efficiency: Printing is faster, continuous use possible (no need to stop printing), less paper waste, fast drying inks
- Autonomous machines that are self-maintenance, self-monitoring, self-adjusting
- Automation with robotics which minimizes personnel in manufacturing, longer automated workflows (eg. JDF, printing with finishing)
- Flexibility of job: Ability to change jobs on the fly, and to run jobs side by side (eg. print on a same sheet)
- Printing on materials: fabrics, wood, plastics
- Going into manufacturing: make your own spare parts or become a manufacturer

When these possibilities present themselves, it is up to the industry and its companies to grab them. In effect, this change divides the companies into roughly two paths:

- Evolution: Business as usual but more with more efficient machines. This path is conservative and doesn't require much worker participation.
- Rebirth: Adopting new business models and clients, driven by in-house innovation and enabled by new technological possibilities. This path is progressive in the sense that work place participation is essential to this rebirth to happen. Also the companies have to invest heavily into their sales for this strategy to work.

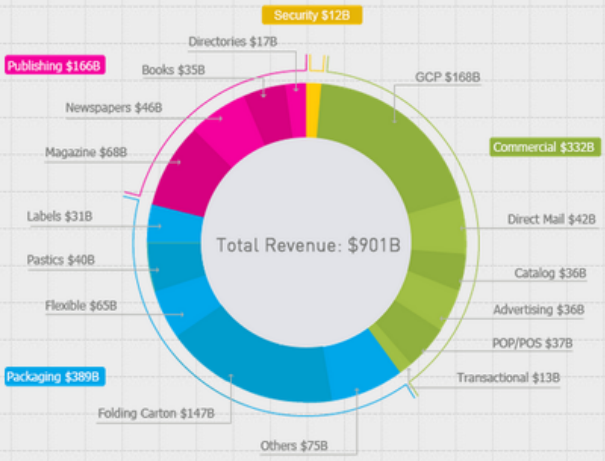
The technical and business possibilities make it more and more easier for industry outsiders to enter graphical production. While the graphical industry itself is broadening its scope, it becomes increasingly difficult to draw the line between the graphical industry and other sectors.

Failing to choose either one of those will lead to dead end and bankruptcy.

MARKET AT-A-GLANCE

The commercial printing market, a US$332 billion industry worldwide, includes multiple subsets — general commercial printing, advertising, direct mail, point-of-sale/point-of-purchase, catalogs, and transactional production. Accounting for US$168 billion in revenue, general commercial printing is the largest category of the four.[1]

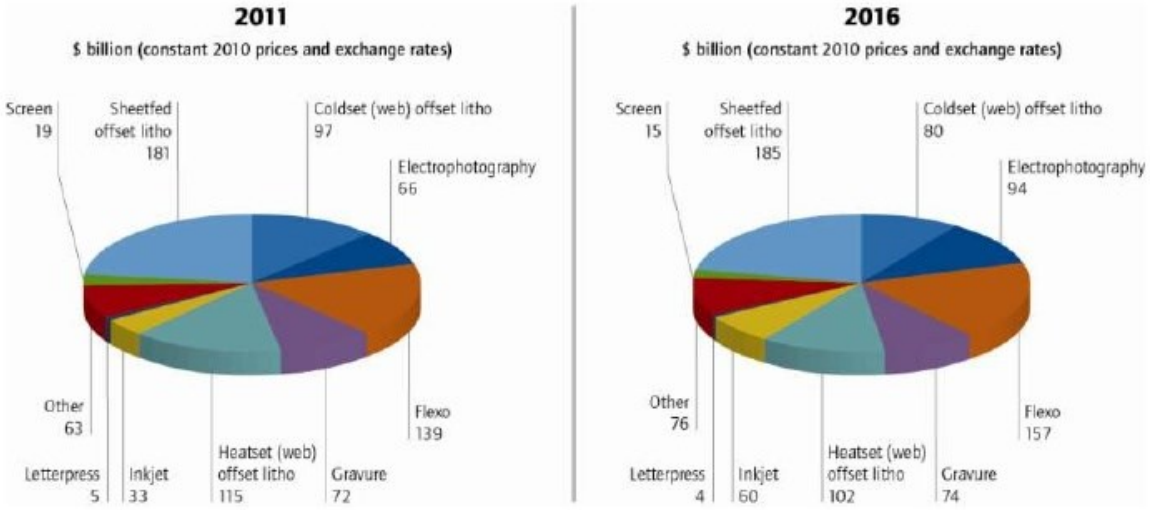
The broad, diverse range of GCP applications encompasses brochures, stationery, business cards, catalogs, postcards, booklets, mailing labels, invitations, calendars, newsletters, announcements and coupons, among others.



The global revenue of the print industry

1. Smithers Pira, "The Future of Global Printing Markets: Market Forecasts to 2016"

Print Processes – market share



Source: Pira International

21

Printing trends

Paper consumption is likely to rise globally. This rise will come in emerging economies, i.e. largely outside Europe. In Europe print is likely to be reduced.

Packaging will grow considerably. Also here emerging economies will see the most spectacular growth.

- Food without packaging deteriorates fast. Estimates show that 1,3 billion tons ends up as waste every year because they are destroyed on the way from field to consumer. Depending on region from 20 per cent to more than 40 per cent of the available food will go waste because of inadequate packaging. (Print and Publishing, May 2016) Packaging can help reduce this waste considerably.

As paper is a sustainable material it will be able to expand in the packaging sector.

Living as we do in Europe, these megatrends will most likely not be felt in our countries. And thus the trend to reduced graphical sector will continue. If there is a considerable growth it will most likely be in packaging.

This trend could also be observed at DRUPA 2016 as all press manufacturers showed a lot of new machines aimed at the packaging industry.

Prices and volumes

Print prices have fallen for many years. There are different reasons for falling prices, over-capacity and companies struggling for sufficient work is one side of the matter. Rising productivity and efficiency is another side of the picture. There is little reason to believe that print prices will rise, but it is all reason to believe that they are likely to fall further.

Print volumes are falling. Most jobs have a shorter print run. This is likely to continue.

Development of traditional print

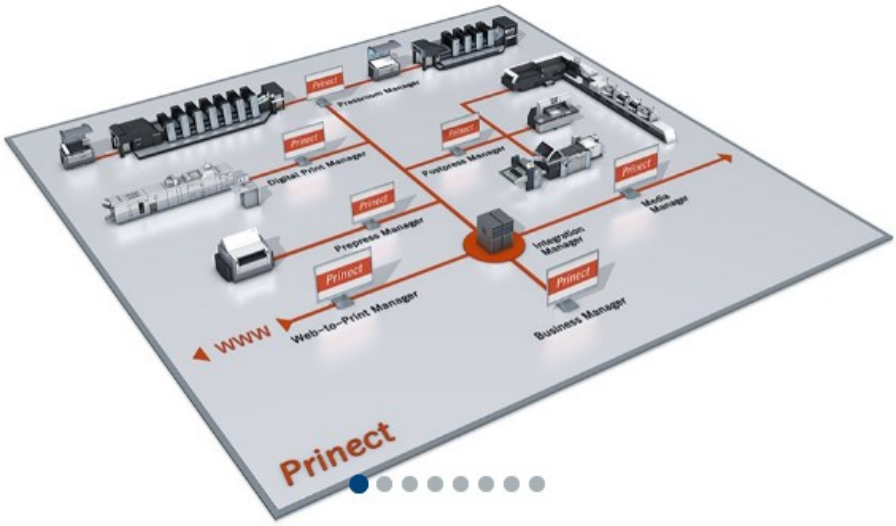
Traditional print has met the demands of the market and competition from digital print by making all processes more efficient. Work flow, make ready times and waste have been reduced.

Digitalisation of the graphical work flow

The completely digitalised graphical work flow has led to new possibilities opening up for the sector. Printed matter is produced in a manner where the media production is completely separated from the actual printing. Any customer can in principle send the work to be printed to any printer. And the whole transaction between customer and printer can be executed on the internet – i.e. without any personal contact between the two.

The case studies show how this can affect the industry, e.g. the Norwegian company Gelato and the Danish company Lasertryk. Lasertryk is an ordinary printer with one printing facility in Aarhus, Denmark and its customers mainly in the Nordic countries, Germany and UK. Gelato has a different approach. They have no printing capacity at all, but a presence on the internet and uses printers where and when needed.

In a more traditional printing company the work flow might look like this:



Source: https://www.heidelberg.com/global/en/products/workflow/prinect_overview.jsp

Prinect integrates the traditionally separate areas of management, prepress, press and postpress, automates the entire printing process and boosts your print shop's profitability. Integration of all these processes leads to more efficient production workflows, offers greater transparency, and accelerates the job flow. Prinect thus makes a valuable contribution to unlocking your print shop's full potential for rationalization and optimization.

Web to print

Taken one step further the workflow starts at the customer's computer. There are lots of different solutions for small and large enterprises. The essence of this is not the printing as such but the technology driving the web solution and work flow.

Digital print

Although digital printing machines can be used in many environments, from the private home to large industrial plants, this report will only have its focus on the digital print as used in a commercial setting. This means that private printing is not taken into account and neither is all sorts of office and in-house printing.

Digital print technology

Digital print can be grouped according to different criteria. The first divide is between printing with a fixed form and printing without a form. The first will reproduce the same print several times and the second will produce individual prints for each printing cycle. In short rip one and print many and rip one and print one.

Inkjet printing is starting to take over a large part of digital printing. It allows high speed and good quality and at the same time delivers individual content. Both traditional inkjet printing machines and Landas new printing technology uses inkjet.

Quality

The quality of the print can be high in digital print (offset quality). It is not a big issue any more.

Output

Digital printing processes are slower than traditional printing. Print speed for digital print is rising. It will be a false perspective to look only at print volume and speed. The new Landa machines for example can reach a production speed of 13 000 sheets per hour.

Workflow

Digital print with small printruns demands an intelligent and automated workflow from print to finishing. Using JDF this is achieved in such a way that most printing machines can be connected with most finishing equipment either in-line or off-line in such a way that the finishing of the print will be automated.

The printing machine manufacturers

Among most of the leading printing machine manufacturers we can see a trend towards new co-operation with the digital technology providers. E.g. co-operation between Landa and Komori and Heidelberg and Fuji. MAN-Roland seems to be a sole exception to this as they don't provide digital presses.

Industry fragmentation

We can observe the rather sharp division between sectors disappearing. As regards digital print we will point to the décor (eg. wallpaper), textiles and garment sectors which meets the graphical sector more and more in many fields of activity. Also we can observe the same for parts of the ICT sector.

Technology, products and markets are more blurred than before and the sharp dividing line between the sectors have in many cases disappeared.

Industrie 4.0

Industrie 4.0, industrial internet or whatever name is used for the development will have an impact on all sectors of the printing industries. This is beyond the scope of this report, but the working group will mention it here. Both EU and IndustriAll have started work in this field which should be followed closely by all the unions, NGU and UNI-EG.

Source: http://www.industriall-europe.eu/news/list3.asp?stid=432

Printed electronics

Printed electronics is outside the scope of this report. The working group will mention the subject here because this might be of immense importance for the graphical industry in the future.

One place to look at printed electronics etc. is LOPEC (http://www.lopec.com/) which has a yearly trade show for printed electronics.

A company called IDTechEx (http://www.idtechex.com/) might be a good way in to see the diversity of technological changes.

3D printing or Additive manufacturing

3D printing has been of some focus to the graphical industry in recent years. A better word for 3D printing is additive manufacturing and then most of the sector will have no particular interest in this subject.

Sales of 3D machines has risen by 35% in 2015. See the article from *www.3ders.org - 3D printer and 3D printing news* (http://www.3ders.org/articles/20160104-global-3d-printer-market-jumps-in-2015-thanks-to-desktop-3d-printer-sales.html)

Intelligent packaging

Different combinations of packaging printing and electronics can be integrated to make intelligent packaging.

Automation and robotics

Automation will continue to develop and more of the printing industry will move towards automatic systems and the work will be done with little or no manual operations.

Robotics is a field where important developments are taking place. One significant development is robots which can be placed in a human environment – working safely side by side with humans. When industrial robots do not have to be placed in a location away from people the use of them will change significantly.

Screen print

Screen print has been taken over by digital print in many instances. E.g. the largest screen printer in Oslo has totally gone over to digital print.

Digital printing versus Screen Printing

For years, t-shirt printers have been using screen printing as their preferred method of printing designs on t-shirts. The only alternative to previous models was iron-on design transfers, which was a very different type of product. Many people remember the movements in the late 1970's and early 80 models of rubber-like so thick designs, which sometimes crack or peel. Another problem with iron-on designs, is the fact that it was time consuming to do multiple t-shirts. Silkscreen process was significantly more effective through which t-shirt printers to make a series of t-shirts faster than creating a higher quality shirt. Screen printing had long become the standard in the t-shirt printing industry. The standard until digital printing starts to evolve.

As the computer has gained popularity in society, so did graphic design. The ability to design unique graphics on computers has become one of the most demanding skill in today's job market. More and more people are using their computer to create unique t-shirt designs. Still, the computer generated desings were printed on T-shirts until the rise of digital printing. The digital printing is the rise of new era of t-shirt printing, which allows a printer to print pictures directly from a computer on a shirt. Digital printing is the 21st century alternative to screen printing.

Faster and cheaper

The screen-printing is still widely used in t-shirt printing companies, and is still a quality process, but the digital process has rapidly become the principal alternative to small runs. Establishing Digital printing set up is much easier and more convenient. In the screen process one has to set up a screen for each color, the design takes, which means that the more complex model is equipped with multiple monitors printer will need. This will increase the physical work, which will increase the cost-effectiveness. When the prices of t-shirt screen printer, always pay more for more colors. With digital, t-shirt with unlimited colors and windows, only a fixed payment / t-shirt. Instead, set all displays in advance, requiring only a series of digital pre-treatment t-shirt, a shirt that gives a good foundation and the prevention of ink spots printed digitally. This is much less time for pre-printing process.

Source: http://printingfortlauderdale.wordpress.com/2011/05/15/digital-printing-versus-screen-printing/

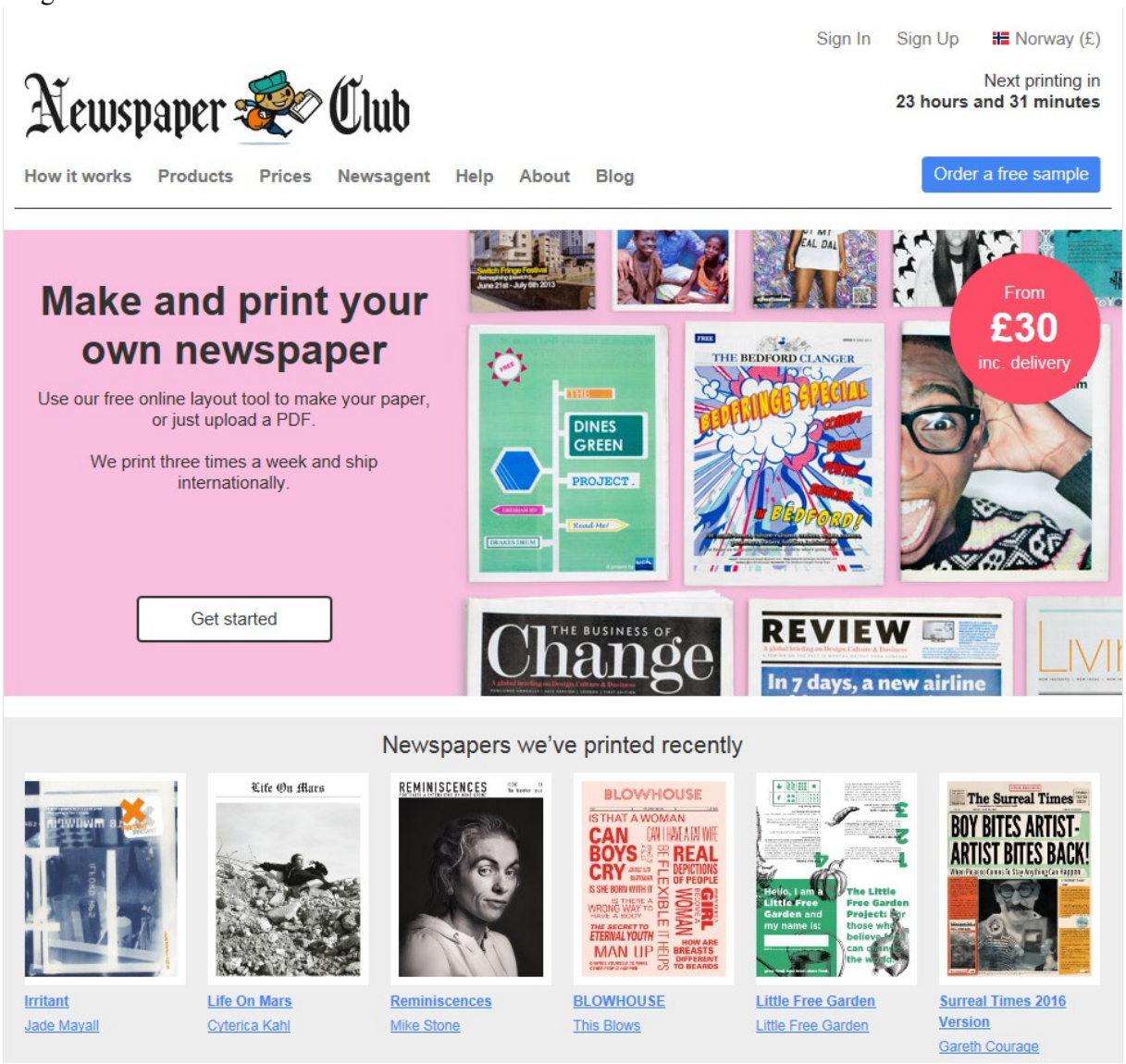
New types of companies

Grakom's trade association in Denmark, which focuses on the digital printing companies, is named Sign & Textil. HK/Privat and Grakom went on a field trip to FESPA in March this year to Amsterdam where we saw the latest trends in the sign business. The types of graphical products we see here are large outdoor advertisements, foil for advertisements for cars, backdrops for a rock concert, etc.

The machines have become cheaper which means that many more can participate. An untraditional example is the local gas station in Vedbæk that bought a colour copier and a cutting machine in order to sell texts for cars. The text could immediately be put on the car. A lot of things like that will emerge – things that also has graphic content.

Newspaper

To give an idea of alternatives out there in the real world:



Source: http://www.newspaperclub.com/

Packaging

For small volume packaging digital print and small numbers of items produced is already possible.

At DRUPA 2016, we witnessed the introduction of digitization.

Kim Jung Olsens DRUPA report

Inkjet technology and digital printing machines dominated DRUPA. Almost all traditional machine suppliers are launching digital printing solutions for small formats. A supplier such as Heidelberg, for instance, combines the mechanicals of their offset presses and their rapid inkjet engines thereby enabling digital printing in B1 format.

At the large stand with digital printing we found Landa, which in cooperation with Komori has developed a digital printing machine they call nano print. This machine prints 13,000 sheets per hour in B3 format.

The quality of the digital printing machines is on par with offset printing, so the price per sheet will be the crucial factor.

In the area of packaging production, we saw, once again, digital printing methods for labels and packaging products in small quantities, as well as for intelligent packaging. The new digital production methods allow production on paper, cardboard, plastic as well as foil. These methods increase the flexibility of the packaging industry towards customers and provide an opportunity to test innovative packaging solutions.

With newspapers, we saw the digital development in which both Canon and HP are offering innovative thinking. They presented turnkey solutions especially for small circulations, which for example are suitable for printing in peripheral areas where data with postal codes for distribution are subdivided according to routes in a single manufacturing run. They print on ordinary newsprint from 40 grams to 90 grams per square meter and up to 140 pages.

The manufacturers recognize that they are a long way from replacing the traditional newspaper press, which has much cheaper production facilities and larger circulations where digital printing can be carried out at much lower speeds up to 325 meters per minute, about 3000 copies per hour. The digital press can easily be converted, thereby allowing for the production of other forms of printed matter, brochures, books, direct mail, etc. Furthermore, in the evening and night hours the printing press can be used for newspaper production.

Binding and finishing were also under massive digital influence. However, the focus is on digital printing machines running on-line, i.e. it is a printing machine and a finishing machine, which is operated like a machine with quick changeovers from one production to another in a stable production flow.

3D printing in the graphic industry is growing rapidly, and as the graphic production companies become ‘full-service’ companies with fast delivery times, 3D printers will become an important tool to quickly ensure spare parts on site.

The Dutch ‘Labfrog’ manufactures 3D printers with a production length of up to 2150 mm, and they can produce finished sleeves using a form in less than five hours a piece – and with a reduction in weight of up to 50 per cent, thereby minimizing the heavy lifting in the flexo industry. Canon in Denmark announced at the trade fair that they will enter into the 3D printing area.

No one truly knows the perspectives of 3D printing, but all agree that it can change this industry considerably.

Kim Jung Olsen spoke with a Danish employer representative from the Danish graphic full service business COOL Gray. He was also impressed with the digitization he saw at the DRUPA trade fair. However, as he said, 'It is interesting that no one is talking about how to get more customers into the store, in view of what the digitization can do now.'

There was also another overall theme at DRUPA, namely the machine manufacturers' focus on ecological sustainability. Future production equipment must use fewer and fewer resources, both in terms of electricity, water and, especially, consumables.

Requirements for employees working with digital print
The DRUPA trade fair 2016 shows that the future is already underway in the graphic industry – it also shows that future will requ6re skilled and educated graphic workers.

The digitization of the graphic production processes will promote a development towards the fusion of more job functions for the graphic workers than we have previously seen. In the future, a graphic worker must – in addition to his graphical understanding, knowledge of the materials, paper, colour (inkjet) etc. – have computer skills in order to operate the digitizing equipment, perform troubleshooting tasks etc.

From a Danish education and training perspective, the DRUPA trade fair became even more interesting because we, together with the employers, are looking to modify the Danish graphic technician training.

Part II - Case studies and other material

New business models

The integration of internet and graphical production has led to a new type of printing business combining the two. The companies will typically have one foot in the printing sector and one foot in the internet/tech sector. There is an aboundance of internet/printing companies in and around our Nordic countries. We will present a few to show how they operate.

Lasertryk (www.lasertryk.dk)

Laser Tryk in Aarhus is the largest company in Denmark that produces digital printing. The company started up in 1999 as an entertainment business and their needs for their own printed matter was big.

Although none of the employees had a graphic education, the company invested in an A3 colour copier, for their own use. They contacted partners, primarily discotheques, to find out whether they should print their marketing material since they had the machine.

This was accompanied by an aggressive price policy, which quickly became a success. Soon one machine was running round the clock, and they could invest in more digital printing machines. Today the company is the largest digital printing company with 130 employees.

LaserTryk.dk now has 40,000 companies and 55,000 individuals on their customer list and has sales offices in England, Germany, Sweden and Norway.

As one of the few graphic companies in Denmark, they could show a profit of DKK 15.5 million in 2014.

HK/Privat has a collective agreement with the company.

Flyeralarm (www.flyeralarm.de)

The flyeralarm GmbH is an online printing company based in Würzburg . The company specializes in the manufacture and distribution of printed materials. Flyeralarm processes daily up to 15,000 jobs; with 20,000 shipments per day for more than 1 million customers. The printing company is 100 percent owned by founder Thorsten Fischer and has a presence in 15 European countries.

Thorsten Fischer founded flyeralarm 2002 but initially printed in other printing companies. With three employees Flyeralarm made more than 250,000 euros in sales in its first financial year. Four years later, Thorsten Fischer bought the first own printing presses . 20 large format and 10 medium-format presses now belong to the company repertoire. Since 2007, Thorsten Fischer and Tanja Hammerl share the management at Flyeralarm. The number of employees has grown to more than 1,300. Revenues in 2012 at around EUR 260 million. In Germany, the company now has four production sites : two in and around Würzburg, two more in the Greater Dresden . Further, the company is involved in the Druckhaus Mainfranken and other smaller companies. Flyeralarm also has subsidiaries in Austria , Italy, Spain , Poland , the UK , the Netherlands and in France . Are produced exclusively in Germany

Source: German Wikipedia with the good help of Google translate

Flyeralarm present itself in this way on its homepage:
FLYER ALARM one of the leading online print shops in Europe in the B2B sector and is one of the largest e-commerce company - and still a very young company: Since 2002, we show - Würzburg Print specialists - such as smart can be the order of printed products , Today we employ approximately 2,000 people and generated sales of more than EUR 310 million in the year, 2015.

Despite the rapid growth, we maintain our maker mentality and thus the very special spirit of a startup. This spirit always been shaped by our corporate culture, the only way we were able to develop a variety of new business areas over the years. Today we are on the direct path to an integrated operator - not only for printed products but also for marketing services and all types of advertising media. In Webshop flyeralarm.com more than three million products are available: In addition to classic printed materials and advertising technology products for business customers, and promotional and advertising products and clothing can be found. Our products are manufactured in ultramodern printing plants exclusively in Germany, in addition, we are represented in Europe today with stores in major German cities as well.

By collecting printing process, we have revolutionized the printing industry. We are the inventor of online printing. Today we process daily up to 15,000 orders for more than 1,000,000 customers. About 240 tons of paper leaves our house every day.

And the FLYER ALARM success story continues: At the international level we are currently present in 15 European countries - and it will be added to other countries. New products and services enrich our portfolio steadily.

Verdi – our sister union in Germany has published a critical article about Flyeralarm – the article (in German) can be found here - http://drupa.verdi.de/portal/druck-und-papier/archiv/ausgaben-2011/++co++14ad6c80-2bb3-11e4-afb0-525400248a66

United Print (www.unitedprint.com)

Our Business – from united print homepage

unitedprint is a trademark of unitedprint.com UK Ltd. – one of Europe's leading online print shops. More than 700 employees work 24 hours for you using the latest technology in a production area of more than 10,000 sqm. Our sites are to be found in 26 countries worldwide - Austria, Belgium, Brazil, Canada, China, Czech Republic, Denmark, Finland, France, Germany, Greece, Netherlands, Hungary, Ireland, Italy, Luxemburg, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, United Kingdom and USA.

Gelato (https://www.gelato.com/)

From the Gelato presentation on their home page:
We are cash flow positive. EBITDA in 2015 grew 170% from 7 million to 19 million NOK.

Since inception in 2007, Gelato has raised a total of NOK 130m, with the latest valuation at NOK 1.5bn.
Thanks to our capital efficient business model and strong EBITDA generation, Gelato's NOK 100+million strong cash position is growing and provides a solid fundament for us to increase our investment into developing our team and growing Gelato.

Team
In 2015 we grew our already strong team through making 16 hires selected among high grade applicants from the best schools and companies world wide. We have built an extensive and rigorous hiring process considered to be one of the most advanced in the world.

Operations
Gelato delivers printed materials to 40 countries, reaching a total population of 1.2 billion people via one global print cloud.

We own no print machines. The print machines we connect to are the premium HP Indigos and Xerox iGen machines. Machines that cost between $1 million to $2 million. Gelato has already connected print machines exceeding a value of $200 million.

Benefits
Printing capacity exceeds demand by a factor of 6:1. Accessing local print capacity all over the world benefits everyone: Delivery distances are reduced. Less waste is produced. Carbon emission is

decreased. Print plants significantly improve their production efficiency. Customers get access to better interfaces across devices. Our users also get high quality print products delivered to them faster and cheaper.

So far their presentation of themselves. In an article in the Norwegian business magasine *Kapital* the Gelato company was called the *Uber of the printing industry*.

Grano (http://www.grano.fi)

Notes from a meeting with Grano's CEO *Jaakko Hirvonen* and HR chief *Anna-Maija Salminen*

Grano is at the moment arguably the most interesting company in the Finnish graphical industry. Firstly, it is one of the largest, with personnel of roughly 750 in Finland, plus 50 together in Estonia and Russia. Secondly, it is a highly visible company, with about 40 print shops and offices spread all around the country.

Thirdly, Grano is a new brand, born from a number of mergers. The company's origins lie in photocopying company called Multiprint. Around 300 of present personnel work still in that segment. During this decade the company has expanded into more traditional graphical sector and acquired a couple of printing plants and a digital media and marketing house. Of the total number 750, today around 500 are production workers.

This rapid expansion has so far been quite successful, and Grano has been making quite good profit through the years. One third of turnover comes from offset printing, one third from digital printing, including grand-format etc. In printing, digital is eating into offset. One reason is the usual story: diminishing quantities. The number of printing jobs has, interestingly, remained for some years at a steady level. The expansion has had its side-effects, too. One is the manifold web2print solutions.

Fourthly, Grano likens itself as a marketing partner. The third biggest of Grano's cash flows comes from constructing in-store stands and displays. To be an effective in marketing, it seems, you have to have strong knowledge in all things digital. In Grano there are about 50 workers in specifically digital production, and that includes coders and software specialists. The company also designs packaging , makes 3D prints and develops eg. digital solutions for marketing purposes (like trace customer's path in grocery stores). There are also roughly 100 salesmen/women on the company's payroll.

In the end Grano is basically a printing company, with a strong and growing digital and marketing twist. The latter part comes chiefly from a company called Digital Media Partners (DMP) that Grano acquired some years ago. DMP was one of the most profitable companies in the graphical sector, and its core business idea seems to be nowadays that of Grano's as well: if you want to make profit, you have to sell your work at the right price, not just the end-product. The in-house software team has even coded a digital clock that counts every minute of work put into a specific job.

In Grano you can see some of the changes in work that are widely discussed about. The business and work are becoming increasingly digital and diverse, so it's not surprising that Grano desires its graphical workers that have multi-skills and extensive software knowledge. Also a huge plus for a worker are skills to operate digital finishing and other post-press devices. For coders it is not necessary to have – and most of them don't have – a background in graphical industry.

In Grano's perspective, the teachers in schools providing qualifications in graphical studies, are out of loop, with out-dated knowledge. For a company that requires skilled workers, this means that they have to train their workers partly themselves. Grano does purchase studies and courses from various schools but it also makes workers to train each other. The company is about to start its own e-learning

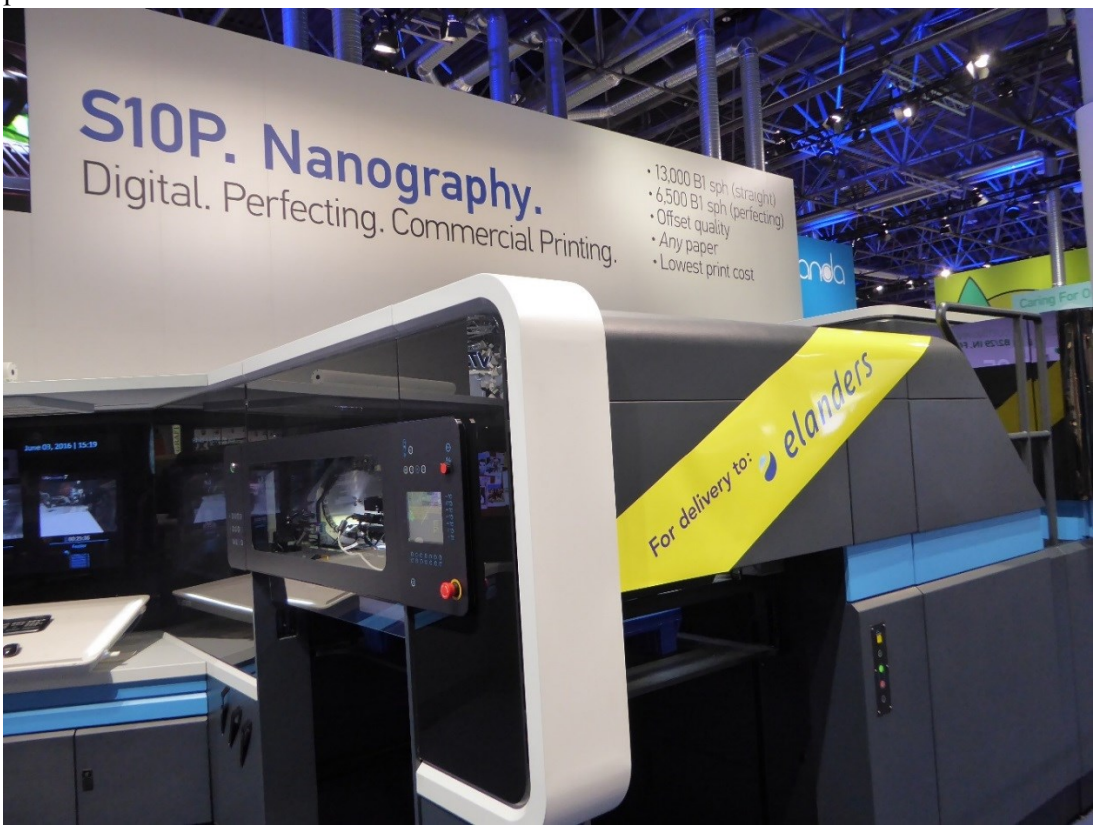
platform that would include web lections made by employees. For example a printer could this way learn about sales. One could call this “multi-skilling”.

Another initiative in the works is building a new “innovation culture” in the company. When the industry and the client’s needs are in constant change, the firm needs every possible input to be on top. Grano is starting an intranet channel for workers’ ideas. There will be also a Facebook-style like-button to discover the best ideas.

There has been a lot of talk about the need for more flexibility in working times. This comes partly from customers’ need to have their job done quickly, with no regard to the usual working hours. The need for flexibility, and also for remote work, can come from the worker side, too. It’s an extreme case, but there are a notable number of coders in Grano, and they usually want to work whenever and where-ever they want to. One of Grano’s coders works from Spain, for example. In increasingly digital graphical sector, these cases will become more and more common.

For IU TEAM Grano is a mixed bag. Some of our members work there, and the company is doing well and there are a lot of opportunities to use ones skills to the max. However, the company is not a member of the graphical sector’s employer’s union (Media Union) and doesn’t follow our collective agreement. Instead Grano belongs to the service sector’s union Palta. Therefore an agreement for copy shops is applied to the workers. That agreement is cheaper in monetary terms and at least used to offer more flexibility in working times. Our agreement now has new terms for working times that, we hope, makes it more attractive for employers like Grano.

Grano homepage - http://www.grano.fi/in-english
Grano Oy is the largest and most powerful digital and print provider in Finland. As the national market leader of our industry, we implement digital and printing services‑related products, marketing and solutions to facilitate and improve our customers’ business operations. The company has offices in twelve areas nationwide. The company turnover is approximately EUR 92 M and it employs 800 professional in 25 cities.



Landa machine soon to be producing for Elanders

Interview with Frank Romano

In connection with DRUPA 2016 an interview was made with Frank Romano. The quotes are from this interview. The whole interview can be read here - http://www.printweek.com/print-week/interview/1157516/-in-five-years-50-of-print-will-be-digital

Romano: "I have this simple philosophy: if you can't make money with something, forget about it" Simply put, he's regarded as one of the world's leading authorities on print. So when print advocacy group Print Power invited him to lunch during his visit to London it was the ideal opportunity to listen to his thoughts on Drupa, the future of print and what Steve Jobs, Benny Landa and Rupert Murdoch have in common.

Darryl Danielli: So when did your Drupa world tour start?

Frank Romano I left New York on the Queen Mary II on the 17 January and it's been fantastic. I've taken in the Caribbean, South America, New Zealand, Australia, Hong Kong, China, South East Asia, India, the Suez Canal, Israel, Italy and Spain, giving presentations along the way.

Israel? Did you see anything interesting while you were there?

[Laughs] Benny [Landa] took me on a whirlwind tour of all the Landa facilities in Israel, including all the secret stuff. He drove me to each of his five facilities, he drives very fast by the way, some of the stuff is mind boggling. Calling it ink is a disservice, it's something else. I thought it was like liquid toner, but it goes way beyond that – it's hard to describe it, call it Nanographic ink, call it what you want. In any case those particles have all kinds of abilities – he has one division that does metallic for cars and the colours are unbelievable. He can also print metallic on paper, by the way. He's essentially taking that ink technology and extending it across [applications]. He sold one part [ColoRight] to a hair products company...

But you think he'll be ready for Drupa?

Yes. The big machine is the size of a [litho] printing press. The Komori-built base alone weighs 37 tonnes, and by the way, when you buy one, Komori will ship the base to you and then Landa will ship the top part separately.

A bit like how airplanes are manufactured by Airbus.

That's right. So that machine will be there [at Drupa], so it now has the format of a printing press, the speed of a printing press and a quality way beyond a printing press. You'll see it at the show.

So come on then, tell us some of those secrets.

I can tell you anything you want on what he has, but I just can't tell you what he's working on [laughs].

And you're still writing books?

Right now I'm writing a book on the history of desktop publishing. I finished another book on the cruise too. One of my students from India is getting his masters degree from RIT, so he did the research for a book on the 'new' print industry, like there's media and 'new' media.

What's the precis?

It's about defining where the new revenue for printers is going to come from in the future. Wide-format inkjet saved the industry in America. We have less than half as many printers as the 63,000 we had in 1995. If you look at the companies that are left and where their revenues come from its wide-format that has generated the new revenue. But where will it come from as we move forward?

I'm hoping you're going to tell me?

Well, we have to figure out how to use 3D printing and how to make money with it, we've got to make money with printing on carpets, plastics and ceramics and how to make money with printed electronics. So in the book we look at some of the markets that are evolving in the same way wide-format evolved. We've divided the book into two parts, traditional and new printed products, and there are 32 sections in each part. The idea being that the new products are opportunities where you can make money. I have this simple philosophy: if you can't make money with something, forget about it.

But generally speaking is print having a renaissance?

I don't necessarily think it's a renaissance, it's more of a continuum. My feeling is that we are about to level off in terms of worldwide volumes. What's going to go digital [online] has gone digital and what's left will be printing as we will know it to the end of the century. I'm an unabashed capitalist though, so the big question is: how can printers make money?

What do you think is going to be the next big step change?

Somehow, the combination of printed electronics with traditional printing. That could revolutionise retail.

It's probably not that far away?

I don't think it is.

I'll let you off. On the subject of digital though, in a funny way as a keen advocate has its progress been disappointing?

One of the things that has always bothered me is that [vendor] companies keep track of something called page impressions, and they talk about the fact that digital is only responsible for 5% or so of the worldwide value of print by [A4 page] volume. That's because the machines were small, but they're now finally getting larger and faster. So if Landa gets his machine off the ground and you combine that with the next generation of the bigger HP Indigos and the other larger-format digital machines from manufacturers like Screen and Fujifilm, then we're now seeing machines that are starting to get close to offset volumes, and we're going to start see some significant [digital] volume growth.

How significant do you think?

I think within the next five years digital will be 50% of the market or more.

It's going to grow that fast?

Now that the machines are available, I really believe it will. As more and more commercial printers start to use large-format sheetfed digital then that will really open the market up. Anybody who is still thinking in terms of A4 pages, that's not the world anymore; it's about signatures, not pages – we need to get page impressions out of our heads.

That's still dramatic growth though?

The technology is now becoming available, before that you had to do the predictions further out because there weren't the machines to base it on, but it's been two Drupas since the Fujifilm and Screen B2 machines were first shown, so now they're starting to move machines. So now if Landa can get his technology out in the next few months, and it appears that way based on the number of chassis I saw…

What about the future for offset then?

Who's the biggest exhibitor at this Drupa? HP. It's mind boggling. And look down the list and Landa's not far behind. You have to go down a few more before you to get to Heidelberg.

What about hybrid technology, where printers have high-speed inkjet heads on offset presses?

I'm not sure that's a growth market long term, because that assumes that there will still be long runs. There will be some, but not the kind of number that might justify that system. There are markets where you want a combination of static and personalised information, but as the [ink/toner] running costs of the digital machines come down that will change.

And running costs are still the elephant in the room for digital surely, but do you think as the volumes increase the costs will come down?

The thing that will open up everything is packaging. Up until now we've been limited on what we can do with folding carton weights in terms of size and speed. Then there's flexible packaging, because that has been a real limiting force in printing because you had to have a flexo press, but if you can do that digitally then it opens up flexible packaging to all printers. And flexible packaging is half of the packaging industry.

And labels?

One of the biggest markets out there is labels, but some companies are already printing directly on the can or the bottle now. Well, why not integrate that with a packaging [filling] line? Then the question is what level of print will be integrated with the manufacturing? The digital label market is gigantic and growing, at the last Drupa I counted around 20 dedicated label printers, this time there will probably

be twice that. What happens for longer runs, if it's printed directly on to the bottle? That will change the whole dynamic of the packaging industry.

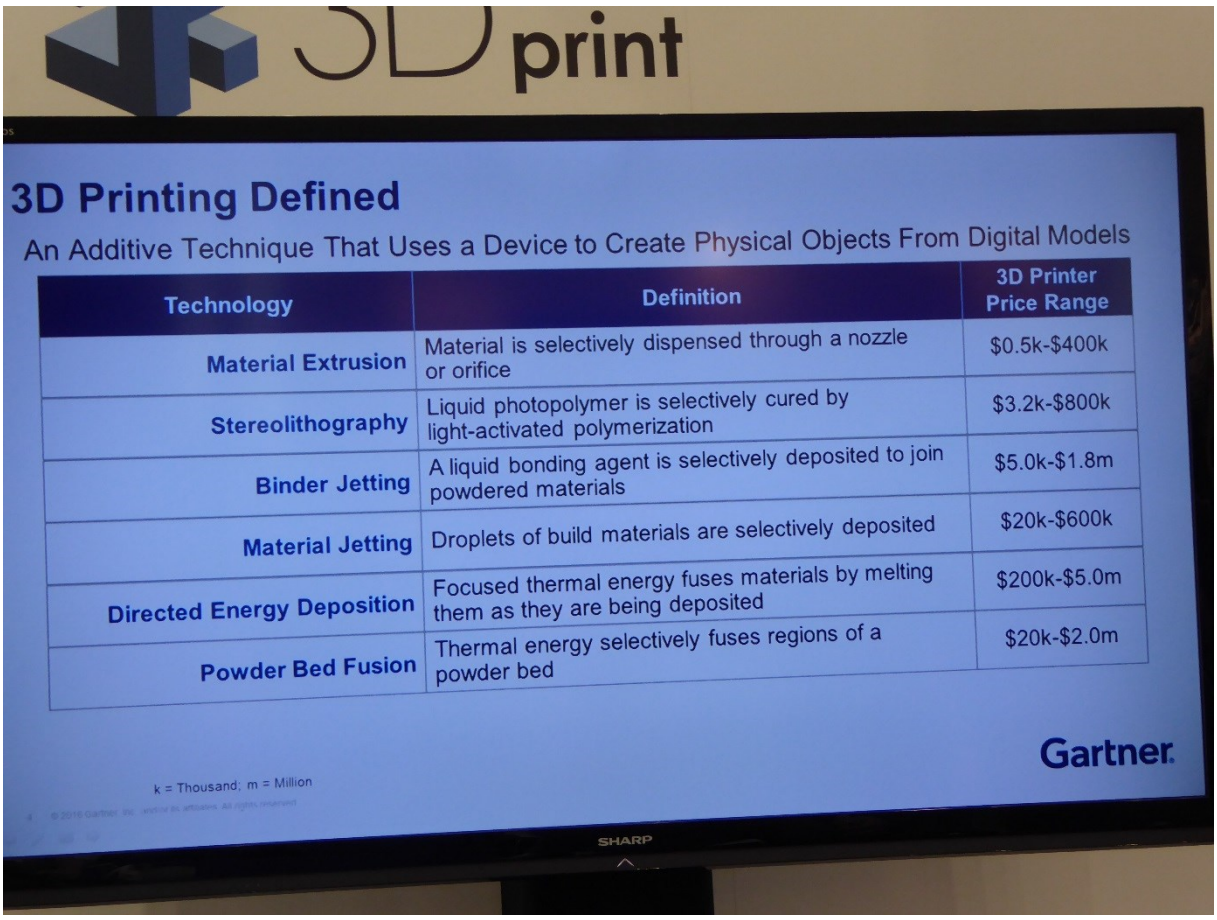
Substrate choice is still a limiting factor for digital too though?

That's right, but as the volumes increase so will the options. I feel for the paper companies though, right now they have to carry so many SKUs – different sizes and coatings for each digital machine. Over the next five years that will change.

Last question then, and I suspect I know the answer, if someone is visiting Drupa and has just 30 minutes at the show - what should they do?

That's an easy one. Go see the Landa show!

For more information on print and paper advocacy organisation Print Power's work on promoting the power and sustainability of print, visit www.printpower.eu



From a DRUPA presentation on 3D by Gartner

For large print runs a new digital printing machine has been introduced:

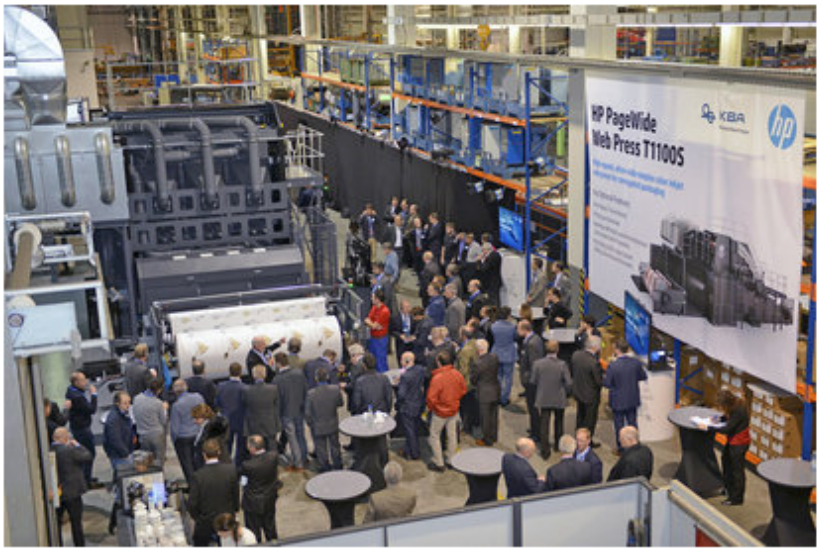
News › HP and KBA present world's most productive inkjet web press

12-04-2015

HP PageWide Web Press T1100S: Pre-print and digital printing in one machine

HP and KBA present world's most productive inkjet web press

HP Inc. and KBA jointly presented the world's first HP PageWide Web Press T1100S on 2 and 3 December to almost 200 international packaging printers and trade journalists at the KBA headquarters in Würzburg, Germany. The gigantic inkjet web press with a web width of 2.80m (110in) was developed in under two years by HP Inc. and KBA-Digital & Web Solutions in close cooperation. It opens up new opportunities in terms of the flexible production of corrugated packaging in various formats and run sizes with digital pre-print liners.



Numerous industry experts from the international packaging industry as well as trade journalists and HP representatives from a host of countries came to the KBA site in Würzburg to experience the world premiere of the HP T1100 S for the corrugated packaging market live. Photo:KBA (1)

Digital printing is the fastest growing process in packaging with a projected annual growth rate of 17 per cent and is expected to be worth $19 billion by 2019.(1) Digital packaging solutions now also enable cost-effective short-runs and unlock the ability to make every box different.

"Converters and brands alike need to create more targeted, effective packaging while reducing costs," said Eric Wiesner, general manager, PageWide Web Press (PWP) division, HP Inc. "HP Inc. and KBA have combined forces to bring the world's most productive press to market(2), offering more value to high-end converters with the efficiencies of pre-print and digital in one press."

Source: http://www.kba.com/en/news/detail/article/hp-and-kba-present-worlds-most-productive-inkjet-web-press/

Part III- Challenges for organisation and collective agreements

Introduction

Technological developments have led to some significant changes in the graphical sector. Changes that will be an issue both in the collective agreement system in the Nordic countries and in the field of education.

Our collective agreements are either based on a specific trade or an industry, or a mix of the two. Historically collective agreements in the graphical sector were based on the trades, typically one for typographical workers, one for bookbinders, one for packaging workers and one for lithographical workers. Traditionally the workers of these sectors belonged to different trade unions who "owned" the agreement and the trades. Changes in technology were a challenge to this system.

Our trade unions have developed from small crafts or sector unions to broader unions covering many trades and sectors. The first step was usually to merge the different "graphical crafts" unions to one larger graphical union. Faced with the decline of the graphical industries these unions have merged with unions from other sectors. The unions that have been the results of these mergers are very different in many ways, but they have one thing in common; they cover many different trades and sectors.

Other trade unions had agreements in other sectors and sometimes technological changes or changes in the organisation of business led to disputes over the boundaries of agreements – basically the question - who owns the right to collective agreement for a particular work or factory?

In the same way the employers federations have made similar mergers and also covers different sectors.

For the graphical sector in the Nordic countries there have been some important disputes over the question of which agreement to choose. The question of right agreement is not only a question of the type of work, but also dependent on what kind of ownership the company has. E.g. companies owned by the public will usually have another agreement than a private company. This often leads to disputes over agreements when publicly owned companies are privatised or private companies are bought by publicly owned companies.

In Sweden Strålfors was bought by the Swedish post and this started a dispute between SEKO and GS-facet over which agreement should be used. In the end the deciison went in favour of GS-facet. In Norway transaction printing went from being a part of the Norwegian post to be taken over by Itella, a private company owned by the Finnish post. As the company in Norway is a private company, the post workers union lost their right to agreement and a dispute ensued over the nature of the work between Fellesforbundet and the office workers union. The result after a long process was that the part of the company which produced print and enveloping was covered by a graphical agreement. In Finland there is a possibility to choose agreement when it comes to digital print between the TEAM union and the service union PAM.

The boundaries between many sectors have been blurred and the agreement system often does not suit the reality of industry.

One example is the boundary between the graphical sector and textiles sector. Parts of these sectors meet in technology (digital print), substrates (textiles) and markets. Then all of a sudden, different agreements can cover the same work or type of companies and the agreements will be in direct competition to each other.

Education and skills

In a period like ours when technology is changing all the time, it is of outmost importance to create an education that can deliver broad knowledge and not very particular skills with little value outside of the specific trade.

There is also a trend regardless of sector of skills and knowledge moving from the head and hands of the worker and into clever machines.

Education must meet the demands for skills and competences in the sector. When the needs change the education must change to deliver workers with the necessary skills. Education must be relevant to the needs of the companies and the number of people given a particular education must suit the needs for this competence.

We are now living through a period of profound changes in the graphical sector. The technological changes and developments must be reflected in the education. The technological changes and the instability of the companies means that workers need a broad education which can be used in different occupations. The age when a young person learned a trade in which he or she could expect to be working for a whole working life is over.

The needs of graphical education, both basic as well as further education, is to deliver skills and knowledge that can be utilised in many different occupations. It is important to keep in mind that basic education is only the foundation for starting a working life and that lifelong learning will be of the greatest importance.

In Norway the social partners and education authorities have started to transform the trades of printer, bookbinder and graphical packaging operator into one new trade combining all tree and in addition also the mailroom of newspapers and digital print. The basis for this education is the broad industry education program.

The Danish think this way regarding education:

Digital printing companies are characterized by the fact that many employees do not have a graphic education and have not formerly been employed in the graphic industry.

In 2006, a new education for graphic technicians was introduced. It takes 3 1/2 years and has replaced the former education for graphic printers, screen printers and bookbinders. It was aimed at the entire technical graphic area from printing to completion, including digital printing.

However, digitization also means that we see new types of companies, e.g. digital printing companies, which previously could not be approved because of equipment requirements. They have now been approved to train graphic technician trainees whose principal activity is digital printing.

At the moment, 181 companies are approved for graphic technician training, and currently 98 trainees have an ongoing training contract in the companies. The education has an even greater potential, within digital printing and the flexo area, and it has previously been calculated that the industry in the future needs an intake of up to 80 trainees per year.

A study by the Graphic Education Committee from 2015 shows that the trainees, who had specialized in digital printing upon completion of their education, had the easiest time finding employment.

Along with the employers' association Grakom, we have launched a small campaign aimed at seeking out new types of businesses. HK/Privat and Grakom have focus on including the digital printing industry in the graphic industry.

Denmark

The graphic industry in Denmark

Competition within the graphic industry is characterized by poor earnings in many companies.

We have seen a slight increase in labour demand in the graphic industry in that there has been a slight increase in the employment rate of 0.4 per cent in the fourth quarter of 2015 compared to the year before.

A similar small cautious positive trend is also reflected in fewer bankruptcies in the graphic industry. Furthermore, for the first time in many years, wages have increased by 1.1 per cent and thus a modest increase can be seen in real wages, after years of decline in real wages in this industry.

Collective agreements for digital print/printing in Denmark

In Denmark, we have two agreements for traditional printers and bookbinders, with the Graphic Association (now renamed Grakom) and the Danish Media Employers' Association respectively. These agreements primarily include general printing and newspaper printing, label printing and, to a small extent, packaging. This agreement does not cover digital print/plot. Furthermore, we have a Packaging Agreement with the Confederation of Danish Industries, which includes most packaging companies in Denmark. For this agreement our understanding is that it covers a 'dynamic' field of activity, as the agreement has changed from a specific technical work description to a packaging sector description of which field it covers.

In 2007, the Serigraphy Agreement with Grakom was expanded to include the digital print and plot printing area.

However, the difference in the respective agreements can be considerable. The Digital Print and Serigraphy Agreement is significantly 'cheaper' in terms of sick pay provisions and working time provisions, both of which are more flexible in the Digital Print and Serigraphy Agreement than in the other graphic area hourly pay agreements. However, pension rates and free choice percentage remain the same.

The Digital Print and Serigraphy Agreement currently covers only 220 employees – with a small increase every year.

However, the fact that only 220 people are covered by the Digital Print and Serigraphy Agreement does not reflect the number of people employed within digital print/plot printing in Denmark. Many printing companies have digital printing machines, and employees, either printers or bookbinders, serving these machines to a limited extent. This allows for both the Graphic Agreement and Digital Print and Serigraphy Agreement to apply in the same company for staff operating the same machine. In some companies, we also find graphic designers operating the machine, and thus the Salaried Employees' Agreement with Grakom can apply too. The premise is that the employee is covered by the agreement that covers most of the employee's work.

In 2012, at Denmark's largest digital printing company Laser Tryk – which will be described in detail below – Grakom took the principle view that bookbinders who finish digital print/traditional printing

should be covered by the Digital Printing Agreement since the finishing treatment came from a digital printing machine. The case was about whether the work with further processing and finishing of digital printing/printed paper is covered by the Graphic Agreement, Special Part IV, Bookbinding.

Fortunately, in December 2014, HK/Privat won a leading industrial arbitration case against Grakom concerning the bookbinders' agreement area. It has now been established that bookbinders and bookbinders' assistants are covered by the Graphic Agreement although their work is to complete books and other prints by digital printing/printed paper.

The ruling thus establishes that no matter which printing method is used, the employees working with the completion and finishing treatment are covered by the Graphic Agreement. Had the case been lost, it would have meant that companies could reassign several hundred bookbinders to the cheaper Digital Print and Serigraphy Agreement.

Digital print in Denmark
The trend we see in Denmark is that digital printing has changed and will change the graphic industry. It will also cause a partial transformation of the workforce in the printing industry. This applies to the technology and the marketing of print-based communications.

A digital printing/traditional printing machine provides faster setup times, smaller circulations, price pressure for cost reductions, more colours, and a higher demand for large formats.

Neither we nor our counterparty Grakom know the investment figures for digital printing in Denmark. Nevertheless, we can see that the graphic medium sized businesses (5 to 20 employees) that need to replace their offset presses, often buy digital printing machines as the quality is the same. It has become profitable in relation to circulation figures.

Overall, digital printing gains market shares while total printed matter decreases by 5.5 per cent (2014 figures).

The product group labels and packaging increases and consequently also the printing method flexo. On several flexo machines in Denmark, we see a digitization of the printing method, which is a mixture of flexo and digital printing. The important question is now: Which agreement should cover the employee who operates the machine in the future as we have a graphic agreement for traditional printing and one for digital printing.

Education
Digital printing companies are characterized by the fact that many employees do not have a graphic education and have not formerly been employed in the graphic industry.

In 2006, a new education for graphic technicians was introduced. It takes 3 1/2 years and has replaced the former education for graphic printers, screen printers and bookbinders. It was aimed at the entire technical graphic area from printing to completion, including digital printing.

However, digitization also means that we see new types of companies, e.g. digital printing companies, which previously could not be approved because of equipment requirements. They have now been approved to train graphic technician trainees whose principal activity is digital printing.

At the moment, 181 companies are approved for graphic technician training, and currently 98 trainees have an ongoing training contract in the companies. The education has an even greater potential, within digital printing and the flexo area, and it has previously been calculated that the industry in the future needs an intake of up to 80 trainees per year.

A study by the Graphic Education Committee from 2015 shows that the trainees, who had specialized in digital printing upon completion of their education, had the easiest time finding employment.

Along with the employers' association Grakom, we have launched a small campaign aimed at seeking out new types of businesses. HK/Privat and Grakom have focus on including the digital printing industry in the graphic industry.

Finland Challenges of organisation and collective agreements

The Finnish problem with two agreements in the graphical sector is still there. The other agreement is done by service sector organisations Palta and PAM, and in principle it is applied to copy shops only. However some copy companies have evolved to be quite clearly part of the graphical sector, and therefore it is challenging TEAM's and Media Unions agreement. Some of those companies are moving into digital business.

Today this rival agreement is applied to 500-800 workers. In this situation the employer can decide its side. For some companies (Grano is one example, see case-study) service sector's agreement is preferable because of less holidays and more flexibility. For the latter something has been done. In TEAM's agreement there are new, more modern working time terms that are now been implemented. Whether this is enough, it's hard to say.

The main challenges brought about by digitalisation for organising workers:

- Digital, more efficient and decentralized production decreases work force. Smaller workplaces equals fewer shop stewards.
- The scope of the industry widens (into services, marketing, software), and it is not clear-cut what agreement to follow on a company level. There are different needs between different personnel groups also.
- Terms of working time and place in current agreements are challenged by the possibilities of technology and the needs of the customers.

Statistics from the industry (incomplete)

	2010	**2011**	**2012**	**2013**	**2014 (estimate)**	**2015**
Blue-collar workers (in sector 181)	7798	7200	6862	6277	5609	
IU TEAM members (bokarbetare)	8966	8266	7332	6739	5992	
Unemployed in TEAM's fund (bokarbetare)	395	550	602	880		
Blue-collar workers (in service sector's agreement)						500
PAM members (in service sector agreement)						300

Norway

The graphical sector is more and more dominated by smaller companies. This is a challenge for our traditional division of tasks between the national and company level. Wages and working conditions are to a large extent defined by agreements in each company. In small companies this does not function if there are no shop stewards.

Small companies have always been more difficult to organise than larger companies.

In the general printing sector – basically everything graphical except newspapers and packaging – it is a large potential for recruiting members and organising in new companies. We have not been very

successful at this. Because of this a large part of the sector is outside the organised working life with collective agreements and shop stewards.

The newspaper sector is dominated by some large companies, but each work place is in most cases shrinking to the extent that it is more and more difficult to have the shop steward system working as it should.

The packaging sector is dominated by two large plants and a number of smaller ones.

The agreements cover the necessary fields of work.

Sweden

The newspaper area will continue the downward trend. Continued major reorganization and closure of printing houses. In this field we also have the problem whit the white collar union who is trying to recruit among our members.

In the printing sector are we moving toward smaller and smaller companies. We have a hard struggle to fight to get them to organize. In the future we can see that more and more of the offset printed material leaving the country and made abroad. And only the digital printed and inkjet printed materials are made in Sweden. Our challenges now and in the future is how we shall work to succeed organizing the smaller company

The Packaging sector today are dominated by 10-15 company's and this sector is increasing. This companies are organized and we have almost 100% members.

Recommendations

Does vocational training, skills – describing technology of the 20th century fit in the 21st century reality? Our thinking must develop from the present way of thinking in categories such as offset and digital and start thinking print as one common category with many technical varieties.

The skills of the future graphical worker in smaller and medium sized companies will be broader and comprise elements from pre press, press and post press/finishing. The unions should start to look into needs of changes in education and training.

Digitalisation of industry - Industrie 4.0, industrial internet - must have special focus from the unions and NGU.

The graphical industry – both on the employers side as well as the union side – tends to look more in the rear view mirror than ahead. Thus a focus on technology in the form of printing machines and finishing machines is too common. The new companies succeeding in the sector in spite of low and falling prices for graphical work are those companies that manages to utilise technology to create a market large enough to produce efficiently.

Attachments – links to the internet

Report on vocational education and training in the graphical industry (in Norwegian)

Global market for 3D printing expected to reach over $49 billion by 2025

[PDF]Download the UK Printing Industry - Future Focus report - Neopost

[PDF]Seeing The Bigger Picture for Digital Print in a Multi-Media World Mark

[PDF]The Cost of Digital Printing in Newspaper Production - Innventia.com