Good things come to those that wait.
– English proverb

Dear Reader,

Well finally after months of prevarication, pronostication and general faffing Heidelberg and Ricoh have announced their strategic partnership. It's not so much of a surprise, as there weren't many options for Heidelberg: only Konica Minolta or Ricoh were really viable choices. Heidelberg seems to have rather burned its Kodak and Xerox bridges, Canon has wed Océ and HP is far too busy to bother with the likes of Heidelberg. Konica Minolta's pockets aren't deep enough, so that left Ricoh.

And a jolly good thing too. The folks at Ricoh are forward thinking and patient, as their progress thus far in their moves within the graphic arts have demonstrated. The company has the vision and imagination to see where the printing industry is headed and what the market needs. This cannot be said of Heidelberg, which has almost willfully ignored the changing times.

But what Heidelberg does have is an enviable distribution network. This Ricoh can use with a strong and credible offset partner to place C901 digital presses with commercial printers. This will further reshape the digital printing landscape.

Enjoy!

Laurel, Nessan, Paul and Todd

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Hunkeler's Innovation Days may be a small, invitation-only event, but it has rapidly established itself as a hot ticket not-to-be-missed event.

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Family Values

Nessan Cleary visited direct mail house the Lettershop Group, to see a finishing line with a custom-built tower complete with eight of Kodak's S10 standalone print modules.

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Wide boy

Paul Lindström has been testing HP's DesignJet Z3200, which comes complete with a built-in spectrophotometer. It's an elegant solution, which together with the wide colour gamut inkset produces some very pleasing results.

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Right of bills

EU citizens are used to some crazy ideas emanating from Brussels, but a new attempt to persuade all EU businesses to invoice electronically seems a step too far. Laurel Brunner investigates and finds a poorly thought through policy.

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News Focus

Quark has announced QuarkXPress 9, due to ship later this month. It allows publishers to directly design work for ebooks and digital devices, alongside print and web design, without the need to learn any coding. It supports output to ePub and the Blio eReader, with publishing to Apple's App store promised as a free update within 90 days. It also adds a number of automation features. See next month's issue for a full review.

EFI has acquired Streamline Development, LLC, providers of PrintStream ERP/MIS software focused on mailing and fulfillment services for the printing industry. PrintStream has several key features and technologies including direct mail and warehouse management/fulfilment tools. EFI will leverage these strengths by offering the PrintStream Warehouse Management/Fulfilment module as an add-on module to a number of its existing ERP/MIS products.

HP is expanding Indigo digital press users' ability to connect with third-party printing, workflow and management information system (MIS) tools with the public release of new HP SmartStream software developer's kits (SDKs). These kits, free at the HP Solutions Partner Portal, cover web-to-print, MIS and production management services.

Global Graphics has won a new contract from Fuji Xerox to supply a white label version of its gDoc PDF creator for the DocuWorks document handling software. Office workers use DocuWorks to manage documents created by different applications and in different formats, including paper, by scanning them into the DocuWorks format. The PDF creator enables them to convert their files into industry standard PDF for sharing or archiving.

InfoPrint has upgraded its Productivity Tracker, which now supports its first cutsheet printer the C900AFP, as well as the inkjet printer range. Essentially it enables customers to collect and analyse on-demand operational data on-the-fly across their production print environment.

Adobe has added Content Viewer for Android technology to its Digital Publishing Suite and claims that a number of publishers are already using it to distribute their magazines. It provides a rich reading experience with support for intuitive navigation, rich visualisations and highly interactive overlays and HTML5 support. Additionally, a robust set of metrics can be captured through the Content Viewer, providing publishers with the opportunity for in-depth analysis of editorial and advertising engagement.

Mimaki has launched the JV34-260, based on the award winning JV33 series. This features a print width of 2.6m and boasts speeds of up to 30 m^2/h alongside a host of further standard features allow print service providers to cost-effectively produce outstanding graphics and images using Mimaki's proven RIP software included in the package. The JV34-260 is available from April 2011.

Global Graphics has announced a new version of the Harlequin Host Renderer SDK that is used in Digital Front Ends or RIP farms to drive digital production presses at full engine speed. Version 2.0 of the Harlequin Host Renderer introduces multi-threaded support for processing live transparency in PDF to greatly reduce the bottlenecks that can be introduced in digital print workflows by this class of jobs.

Xeikon has launched a new partner program, Aura, to bring all its partners under one umbrella. The program covers all workflow solutions and resources.

It offers customers a tool where all research on solution development is brought together in order to let them benefit from the work of Xeikon's integrations team. Existing and future partners also gain from this overall framework that enables them to offer a total, integrated solution to customers.

PrintSoft and **Xeikon** have announced a global strategic alliance to create a one-stop shop catering to every aspect of the customer correspondence process. PrintSoft's expertise and technology will enable businesses to automate the creation, production and delivery of targeted correspondence, while Xeikon has the solution to quickly output that content in the optimum way on the strongest medium, paper.

Manroland has introduced a new Lightweight Paper Performance Package for the Roland 700 series. The results of extensive research and field tests include numerous technical solutions focusing on feeder, infeed, delivery, and antistatic equipment. The performance package can increase production output by 25 percent or more. The increased output not only comes from a higher average printing speed but in particular through reducing or avoiding press stoppages in the feeder or infeed area through optimisation of sheet separation and sheet feeding.

Mimaki has unveiled its new JFX-1615plus wide format printer. It shares the same fast, high-quality LED UV curable ink technology of the JFX-1631plus; but with a bed size of 1.6m x 1.5m it provides a flatbed solution for companies with a smaller format print requirement.

Mimaki has also added clear ink to its UV LED curable inkjet printers. The clear ink will be available in March 2011. The new clear ink enables glossy and matte finish effects, adding creativity and value to the final product.

Mutoh has launched a new series of garment pattern marking / cutting plotters, called Kona Apparel. Available in two models - Kona Apparel 1400 (cutting width 1365 mm/ 53.7ins) and Kona Apparel 1650 (cutting width of 1615 mm/ 63.6ins) - this new plotter series will ensure accurate long-length plotting of marker lines on design templates and cutting of garment patterns. It comes with a tool head that can hold several tools at a time and can switch easily between marking and cutting.

Antalis McNaughton is to sell Stafix, a printable static cling film that can be quickly and repeatedly applied to a variety of surfaces. Manufactured in Finland, it doesn't use glue but because a static charge is permanently embedded in the film, it can be repeatedly repositioned and leaves no residue or damage to surfaces.

Colour experts **Alwan** have teamed up with **Digital Information,** a world leader in closed-loop systems. The new solution combines the companies' industry-leading software, Alwan PRINT Standardizer, DI InkZone Move and DI InkZone Loop. The integration of the three products in one unique and complete solution will enable users to print to standards, every job, every day.

Proofing system ORIS Color Tuner//Web has been upgraded to version 1.2 with full device support – including advanced color measurement and packaging-specific features – for high-end inkjet devices from Canon, Epson and Roland. The software has enabled **CGS** to become the first company to achieve FOGRA certification on the Epson Stylus Pro 4900 printer.

Dr Donald E. Troxel, 76, one of the co-founders of **ECRM,** passed away on January 18th. Dr Troxel was instrumental in the development of many ECRM products, including the highly successful Autokon laser-based camera, scanners, film setters and plate setters. Dr Troxel is survived by his wife Eileen, and his three children, Gregory and Andrea Troxel and Jocelyn Milton.

Fujifilm has developed an iPad app for its online proofing software, XMF Remote that will allow printers' clients to view, annotate, and approve jobs on their iPads. By simply logging in to the printer's XMF system, customers can have instant secure access to all of their print work currently in production, from wherever they may be.

Enfocus has updated its PitStop Pro 10 application to support Adobe's Acrobat X. The recent introduction of Acrobat X saw a major change to the user interface. It no longer uses the familiar toolbar menus but now groups all the main panels on the right side of the document

window. PitStop Pro is a plug-in to Acrobat, and this update is designed to work with this new menu structure.

Atlantic Zeiser has released the sheetfed Digiline Sheet 500, a modular, fully integrated, standardised system for print service providers needing to code and serialise excise labels, lottery and event tickets, or travel tickets. Printing results are said to be comparable to offset printing in terms of quality and production speed.

News Analysis

Heidelberg has finally announced, following a year of prevarication, that its digital partner will be Ricoh. This will see Heidelberg selling the Ricoh Pro C901 printer, thus filling a gap in its line-up. This is a mid-volume production printer using Ricoh's own PxP™ chemical toner. It runs at speeds of up to 90 pages per minute, with an actual monthly production volume from 80,000 to 300,000 A4 pages.

Heidelberg sees this sort of a machine as a perfect complement to its Anicolor press, which it believes can compete against the higher volume digital printers like the iGen and Nexpress. It's a compelling argument, because although the Anicolor can't do variable data, most of these devices are being used for short run fast turnaround work, which the Anicolor can also cope with.

The global strategic cooperation, which includes Ricoh services and support, will start in April 2011. The first markets will be UK and Germany with a phased rollout to follow in other geographies with completion targeted for drupa 2012.

Heidelberg and Ricoh have been rather coy about any future plans. They have confirmed that there will be some integration based around Heidelberg's Prinect workflow, which would allow it to drive the ProC901. The two companies have also hinted at "joint development activities for future printing applications".

Meanwhile, many people speculated that Heidelberg would have chosen Konica Minolta, particularly since the two companies already have a distribution agreement in the Australia/ New Zealand region. Konica Minolta also has a light production printer that would have suited Heidelberg's criteria. Its strategic partnership with Océ ended when Canon acquired Océ leaving Konica Minolta as a relatively small player while its competitors are merging into larger corporations.

Instead, Konica Minolta has moved closer to Kodak, with Konica Minolta selling both Nexpress and Digimaster machines. For it's part, Kodak will sell the Konica Minolta Bizhub printers in the US, UK, France and German markets. Ricoh also sells the Nexpress in some areas, though it's not clear at this stage if Heidelberg can take advantage of that.

For now, Heidelberg has plugged the gap in its line-up, and Ricoh is big enough that even Heidelberg should be able to make a success of this digital venture. It also marks another milestone in Ricoh's continuing move into the print industry. Ricoh is still primarily a manufacturer of office copiers, but its production printers are solid performers and it is slowly gaining market share in the graphic arts. Its acquisition of InfoPrint was a bold move into the demanding high speed digital production environment, and this alliance will see it consolidate its presence yet further: Ricoh is clearly going to be one of the major players at the heart of the print industry.

Heroes & Zeros

Hero

Hunkeler AG for starting the Hunkeler Innovation Days event which happens every two years in Lucerne, Switzerland and which has no peer. It started in 1996, and every two years since has brought together the most important providers in the paper processing sector. It focuses on holistic production systems with real practical relevance presented in a very informal atmosphere with none of the distracting glitz of a trade show. The lack of carpets and bright lights most definitely keeps buyers focused!

Zero

Politics is way off message for Spindrift, but we can't ignore the horrors Gaddafi is inflicting on his own people. He's not the first nor sadly will he be the last, to demonstrate the consequences of willful sustained ignorance: paranoia, repression and murderous tyranny. But his benighted people see a light beyond and are moving bravely towards it.

Green Shoots

Ricoh has been named as one of the "Global 100 Most Sustainable Corporations in the World" for the seventh year running. The 2011 list was presented during the recent annual World Economic Forum in Davos, Switzerland. Ricoh has for many years been deeply commitment to sustainability in its own company policies and manufacturing, but it is also proactive in improving sustainability for its customers and providing sustainable innovations that deliver energy and cost savings.

The World Wildlife Fund has announced a Check Your Paper tool. This online database allows buyers to find environmentally sound coated and uncoated paper products. But it isn't clear what counts as sound or not. The idea is to help paper buyers choose the most environmentally friendly papers available before buying. The WWF is encouraging all paper makers to join the list, which currently comprises around one hundred papers including office and professional printing stocks.

Our Verdigris environmental initiative has a new partner called Friends of Print & Paper. This is a UK group that has put together a website to encourage the use of paper and print. It's heavily biased towards paper, but it's another plank in the platform of print's sustainability.

In the US Agfa Graphics has awarded two companies its GreenWorks Environmental Recognition Award. Curtis Packaging of Sandy Hook, Connecticut, reduced its annual energy costs by $32,000 by switching to Agfa's Energy Elite plates two years ago. Hopkins Printing, of Columbus, Ohio, uses Agfa's chemistry-free and low-chemistry plates, and a solvent recycling system so the company uses less blanket wash.

For more green news, check out The Verdigris Project:

Verdigris

http://verdigrisproject.com

The Eizo CG245W monitor has a built-in colorimeter, which makes the calibration a breeze. It's a 24ins widescreen monitor for high-end image retouching, thanks to a large colour gamut (Adobe RGB) and IPS panels.

A Review

Self-calibrating monitor – is it possible?

We have tested monitors for high-end graphic arts production continuously for several years now, all the way back to when the first LCDs made their entry onto the market. What's new right now though is a self-calibrating monitor from Eizo, the CG245W.

Wait a minute – self-calibrating, haven't we heard this before? Yes, Apple claimed this at some point for the first series of Cinema Displays, but we were never fully convinced that it really worked. There was no sensor involved in that process, so what was really happening when you pushed the "Calibrate" button wasn't too clear. But not to worry – Eizo hasn't made that mistake. The CG245W contains a little built-in colorimeter that unfolds when the operator asks for a re-calibration or validation.

We usually only look at monitors for high end photo retouch and imaging processing, and there are a few criteria that such a monitor needs to meet. First of all it should be possible to perform hardware calibration. This does not only mean that you use a measuring device, but that the calibration software can actually control the monitor directly, not only the graphics card. The control can be either through a DVI cable, or through a separate USB cable. In Eizo's case there is a separate USB cable connected to the monitor, which also acts as a USB multiplexor port.

Secondly, the monitor should be fitted with a hood to minimize influence from ambient light. The CG245W comes with such a hood.

Thirdly, the calibration software should offer means of verifying the calibration, including testing the final ICC profile generated. The Eizo ColorNavigator software is used for both calibration and validation. ColorNavigator doesn't evaluate if the monitor conforms to the softproofing standard ISO 12646. To evaluate this we use the U-DACT (Ugra Display Analysis and Certification Tool). But the pre-setting for "Print Production" in CG245W creates a calibration and ICC profile for the monitor that was validated by us as being compliant to ISO 12646, according to U-DACT.

Also, it's very important that a high-end softproofing monitor is very stable no matter at what viewing angle you

look at the screen. There shouldn't be a large hue shift in the picture just because you move your head somewhat. The Eizo CG245W uses high quality IPS panels (In-Plane Switching), which in general offers a very stable viewing result at any viewing angle. We gave top score on this point to the CG245W.

Finally the monitor needs to have a large enough gamut to be able to simulate the colours in your publishing process. In print and photographic publishing this means that the monitor should ideally reach Adobe RGB on the one hand for photorealistic output and retouch, and high quality offset or rotogravure printing on coated paper on the other hand, for CMYK-based printing. According to the U-DACT test the Eizo CG245W reaches the colour gamut needed for both Adobe RGB and ISO-compliant print on coated paper. U-DACT even suggests that the

Calibration	
White Point	yes
Gray balance	yes
Profile quality	yes

Softproofing	
MultiColor, HighBody	yes
Offset/Gravure Paper Type 1/2	yes
AdobeRGB	yes

The Eizo CG245W is compliant to the ISO 12646 standard for high-end monitors used for proofing according to ISO 12647 printing conditions. We tested this using the software U-DACT (Ugra Display Analysis and Certification Tool). We strongly recommend Eizo to add something similar to its validation procedure. As for now the validation report from ColorNavigator is difficult to assess is regard to ISO standards.

The built-in measuring device is a colorimeter that swings into place when the operator pushes the "Calibrate" button, or calls for a re-calibration from the software provided with the monitor.

CG245W can be used to simulate 'Multicolour' printing, that is, printing with more than the process colours CMYK, such as using spot colours as well.

We were curious as to what type of measuring device is used inside the CG245W, and according to product manager Masato Nakashima it's a colorimeter 'made in Japan', but the name of the actual manufacturer isn't disclosed. Mr Nakashima however stressed that the built-in colorimeter is correlated at the factory towards a high-end Konica Minolta spectrophotometer, so measurements should be accurate enough for quality monitor calibration and validation.

The calibration software ColorNavigator accepts other measuring devices than the built-in one, so we could, for example, make an alternative calibration using our X-Rite DTP94 and/or EyeOne. There is a separate tool outside ColorNavigator to correlate the measurements made with the built-in colorimeter and other instruments, useful if other types of monitors are used in the workflow. When we tried this software both the DTP94 and EyeOne passed the criteria set up by Eizo for tolerances between instruments.

Conclusions – a summary

We like the CG245. As is shown in the test results it proves to be a real high-end monitor for colour accurate softproofing. It's amazing how quickly you get used to the convenience of making a calibration 'hands-free'. Is it 'self-calibrating'? Well, almost. You can choose to push a button on the monitor, for calibration according to pre settings, or by starting the ColorNavigator software. From there on it's totally automated, once you decided on what settings you want.

For validation however we recommend Eizo to include something similar to U-DACT. The validation made by ColorNavigator gives clues as to whether the monitor is within tolerances or not, but the report is quite

▶

demanding to interpret. For printers and publishers that want to conform to an ISO-based workflow in regard to quality management, it would probably be welcome if the validation software could give a clear and easy to understand report of compliance to a given standard. But besides this, both the hardware and software work great in tandem with the Eizo CG245W. Well done!

Test results - Colour gamut and view angle

Model	Total colours	% of Adobe RGB	View angle (1-5)
Adobe RGB 1998	1,306,820	100	n/a
HP Dreamcolor LP2480zx*	1,436,000	110	4.5
La Cie 724*	1,441,000	110	4
NEC Spectraview Reference*	1,441,000	114	4.5
Samsung SyncMaster XL24*	1,379,000	106	4
Quato IP262e*	1,363,000	104	4.5
Eizo CG245W	1,305,000	100	5

*Tested in previous tests.

Test results - U-DACT test of softproofing capacity according to ISO 12646

UDACT test	Multi Color proofing	ISO 12647-2	Uniformity, average*	Uniformity, max
Eizo CG245W	Yes	Yes	2%	5%

*In ISO 12646 it's recommended that the maximum deviation of the luminance over the surface of the monitor shouldn't be more than 10%, but in our experience this is a bit too generous a tolerance. The values obtained when measuring the CG245W is well in conformance of what one can expect of a high-end proofing monitor, in regard to good uniformity over the whole surface.

Specifications and approx price

Model	Screen size (inch)	Resolution	Price € (approx)*
Eizo CG245W	24	1920x1200	2,000

*VAT excluded

Did You Know?

ICC v4

First of all, did you know that there is a version 2 of the colour management profile format from the ICC (International Color Consortium)? If yes, you probably also know that the latest version is number 4.2.0.0, from 2004, equal to the ISO standard 15076 of 2005. But what happened to version 3? Was there ever a version 3?

We asked ourselves this some time ago, and at an ISO TC 130 meeting (the technical committee that is responsible for updating ISO standards for Graphic Arts production and for suggesting new standards) we had the chance to pose this very question to a group of ICC members. At first the question caused some confusion amongst the little group, with comments like "surely we had a version 3 published at some point"?

But finally Craig Revie of Fujifilm and a former chairman of the ICC, concluded – no, that was never officially published. We went straight from version 2 to version 4, with only having had version 3 as internal draft versions. So now it is official – there isn't any version 3 of the ICC profile standard and, sort of, never was.

But the second question that has come to our mind is why there are still so many ICC profiles in use that are mainly compliant to version 2, when version 4 was published way back in December 2001? For example, one of the most recently published ICC profiles for gravure, the PSR v2 series (for different paper types), published in 2009 by the Gravure Working Group within ECI (European Color Initiative), is made compliant to version 2 of the ICC format, not version 4!!

Again we turned to Revie, to ask for some kind of explanation to this. In brief, his reply is this: "The biggest issue with v2 was the poor specification which led to many broken v2 profiles. Recently most profiling packages create v2 profiles using the v4 specification which removes most of the problems. In practice this means that the benefits of v4 are hard to demonstrate in practice. This has meant that the v4 adoption has been slow."

Did you get that? Many profile applications create profiles according to the specifications of version 4, but name them to be compliant to version 2. And this seems to work fine. No wonder people find colour management really tricky to get their head around. We suggest a change of usage here: If you create an ICC profile according to the version 4 specification, then name it so that it's clear that it is a v4 compliant ICC profile. And then see what happens. In this way we will discover which RIP systems really can handle v4 ICC profiles, and which ones cannot.

Picture This

The rumours are that the next Ipex, due to be held in 2014 will be held in London subject to an engineer's report into the loading capacities of the floors at the Excel centre, in the docklands areas to the east of the city - with the NEC as a back-up plan if the floors aren't up to it.

Visitors to the last Ipex may remember seeing this Indigo E1000 printer at the entrance to one of the halls. For many people this is the device that made digital printing a practical reality. It was first demonstrated at the 1993 Ipex show, and the fundamental Indigo technology still remains viable today. It made Indigo a worldwide success and much of the success of HPs Graphic Printing division stems from it.

Happy days

Hunkeler's Innovation Days have become a must-see show for anyone interested in high volume digital print production, covering everything from printers to finishing kit.

The biannual Hunkeler Innovation Days in Lucerne, Switzerland, started out as a private event to showcase new developments and promote partnerships for customers. This year over 6000 people, a great many with chequebooks to hand, participated in the four day show of printing and postpress systems. It's a highly focused, compact exhibition, with none of the wasted space and irrelevant glitz so often associated with tradeshows.

The show is split into two areas: a large dining room which affords plenty of opportunity for networking; and a single hall with some 30 or so lines demonstrating different applications. Not surprisingly, just about all these lines featured some kit from Hunkeler, easily recognisable with its translucent blue covers. Hunkeler provides a range of different modules which can be combined for various applications, including everything from unwinders and rewinders to cross cutters, perforators and folders.

One obvious trend to emerge is for wider widths, particularly for inkjet printers where the only real barrier to producing wider print arrays is the lack of postpress kit. Hunkeler has addressed this with its latest generation POPP7 modules (where POPP stands for Printer Online Paper Processing), developed for use with 762mm print widths from printers such as the HP T300 series.

There was a simple technology demonstration for sheeting printed webs, with a roll loaded on a UW7 unwinder module, leading to a CS7 cross cutter and a Mabeg stacker. It's a simple concept but it does mean that printed rolls can be rapidly converted to a stack of sheets, which is exactly what many customers are looking for as it enables them to use continuous feed print with their existing finishing equipment.

For this show, Hunkeler has introduced a dynamic perforating and punching module, the DP6. Here, the tool

cylinders operate independently so that the punching and perforation patterns can be changed from one copy to the next. It has a modular construction so that you could add two cross perforation cylinders in series or have different patterns on the two halves of a two-up web. An optional unit adds a registration mark, which is necessary for pinless web printing, for the printing machine to know where the perforations are.

Hunkeler is well aware that the new generation of inkjet printers has proven particularly successful for book production and demonstrated a book production line. This featured Hunkeler's PF7 Double Plow folder, the idea being that the double fold makes it easy to switch between different page configurations. It will work inline with a printer but for the show, this was seen with a UW7


Hunkeler's Double Plow fold unit as demonstrated with its book production line.

unwinding module with a roll that had been preprinted on a Kodak Prosper press, with three pages sitting side by side on the web. The double fold placed the three pages one on top of the other, ready for trimming with a CS6 cross cutting unit.

The book production line was completed with a new SD7 non-stop stacker unit. This can run at up to 200 metres per minute and can stack book blocks from 10 to 50mm. It features integrated signature gluing, making it easy for an operator to pick up the individual book blocks even when several blocks are sitting on top of each other.

On the newspaper front, Hunkeler showed a folding line that was capable of producing both tabloid and broadsheet newspapers. A preprinted web was fed from a
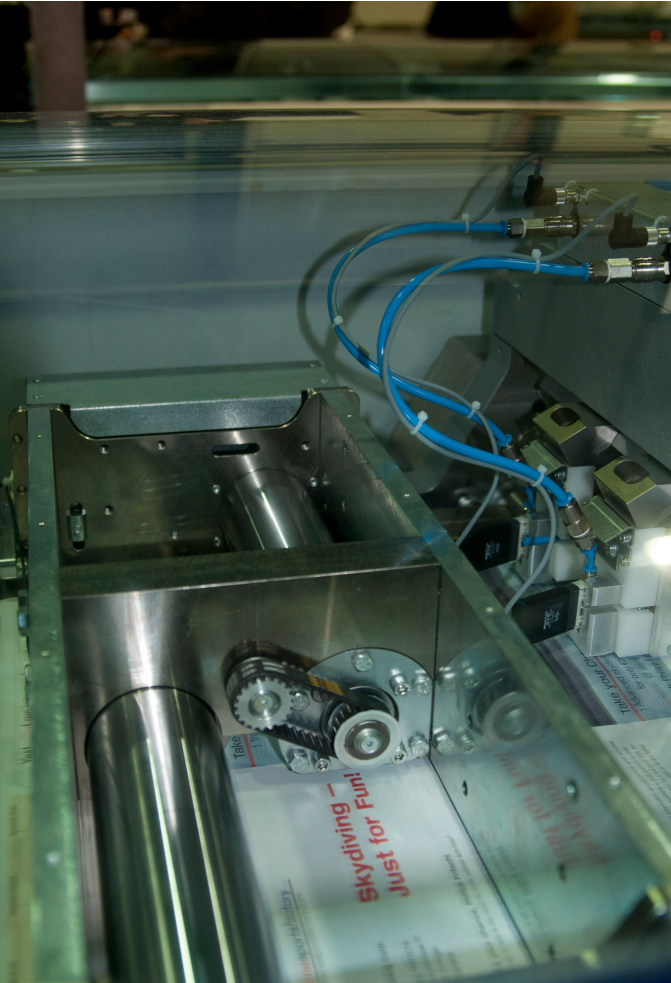
This Dynamic perforator and punching module boasts tool cylinders that operate independently so that the punching and perforation patterns can be changed from one copy to the next.

UW7 unwinder unit, through a CS7 cutting module, and then sent as sheets to a DC7 Drum Collator. A new gluing option glues the individual sheets together along a central fold. However, the gluing unit can be turned off between sheets, which makes it possible to separate sections within a newspaper.

From here the newspaper pages could be directed to one of two Heidelberg buckle folders, one for folding to tabloid size, and the other for broadsheets.

Production print

Managing director Stefan Hunkeler knows full well that the company's future is closely aligned with the move to digital printing, and consequently there was a lot of emphasis placed on partnerships with digital printer vendors. Those vendors in turn have responded by choosing the Hunkeler event to launch new models.

Xerox showed its new inkjet machine. Little seems to have changed since this was shown at Ipex as a technology demonstration other than that Xerox is now openly talking about selling it. However, it appears to be at a very early beta stage, with Xerox showing no particular inclination to sign up further customers, having turned away at least one company that we know of.

It uses solid inks, which are heated to liquid form so that they can be jetted to the paper, where they immediately cool and bond to the surface of the substrate. There's no water involved, and therefore no further drying is required. Better still, the inks are said to deink easily for recycling.

It has 600dpi resolution and a 20.5ins print width, using seven heads stitched together. Xerox owns the print head technology and the heads themselves are robust stainless steel piezo heads, which have been enhanced for high speed production. For the moment it's a four-colour machine, but there is room to add further heads, with MICR seen as a priority for the target market.

It's a web-fed machine, with a print width of 520mm, and speed of 152 metres per minute. It handles paper from 50-160 gsm, with Xerox showing samples printed to 43 gsm media that looked good, helped by an impression roller that flattens out the waxy dots. Kevin Hoary, vice president of Xerox production marketing, says: "It achieves low cost by using standard uncoated untreated papers that are the type that our customers have told us that they want to use." However it doesn't work so well with coated stocks because of their smoother surface.

Screen used the Hunkeler event to unveil its fastest yet Truepress, the Jet 520ZZ, and to announce the first European customer, Leaderform, an Italian direct mail specialist. The Jet520ZZ runs at 220 m/min, equivalent to 173,280 A4 pages per hour. It takes paper up to 520mm wide though there is an option to support 570mm-wide media. It uses Epson greyscale printheads and has a maximum resolution of 720 x 720dpi.

Screen also showed its new Equios workflow, which takes advantage of the latest version 2.5 of the Adobe PDF Print Engine and can also handle PDF/VT files. As well as being

a highly efficient RIP, the variable data abilities will help Screen to better tackle the transactional market and will see it potentially competing directly against InfoPrint with its AFP workflow. Screen also announced an Equios Online module for proofing and approving eBooks.

Kodak announced a new addition to its range of standalone printing modules with the Prosper S20. These use Kodak's Stream continuous inkjet technology. As with the existing S10, it has a 4.16ins wide print swathe but the speed has doubled to 600 metres per minute albeit at the expense of the resolution which drops to 600 x 300dpi. Existing S10's can up upgraded to this specification.

Kodak also showed off the latest addition to its VL series, the VL6200. This offers 600 x 600dpi resolution and runs at 150 metres per minute.

The Nexpress line has gained some enhancements including the option for a longer sheet size, up to 660mm, which should open up some new applications such as wrap around dust covers for books. There's a new HD dry toner, which has a smaller toner particle size and which does lead to noticeably cleaner images. Product marketing manager Andreas Nielen-Harben says: "It's got a far higher line screen frequency, and with the HD toner and the software in the front end, it has 190 lines per inch, up from 150lpi." He adds: "The smaller toner particles will be backwards compatible with existing Nexpress machines but it will take over a year to switch all production over to this."

Kodak has also announced a photo edition Nexpress, which uses light black ink in the fifth colour station. This rules out any enhanced gloss effects but the Nexpress can now produce quite a nice matte effect.

Impika brought its i2400 inkjet printer. This was shown last year at Ipex, but now runs at 254 metres per minute but with a lower resolution of 360 x 600dpi. The speed drops to 152 mpm at 600 x 600dpi resolution. Nonetheless, the print quality does appear to be very impressive.

Nipson brought its DigiFlex printer to the show, complete with a new colour toner. The DigiFlex uses magnetography, a dry toner system capable of printing to

a very wide range of substrates at very high speed, but in monochrome, albeit with spot colours. It's mainly used in the transactional market but UK managing director Brian Palphreyman says that the company is developing its own inkjet solution to cope with increasing demand for

Brian Palphreyman, managing director of Nipson UK.

colour. It will be a continuous feed device, using Kyocera printheads, with 600dpi resolution and running at 75 metres per minute.

HP showed off an interesting printer, developed by DJM, for applications such as adding variable data to preprinted direct mailers and envelope addressing. This uses HP's C400 printmodules, as developed by HP's Speciality Printing Systems division. These modules use the same fourth generation thermal inkjet heads that are used in the Inkjet Web Press series.

More than printing

HP also had a T200, shown for the first time as part of a Pitney Bowes Intellijet 20 solution with printed pages going to an MPS mail inserter. This was complemented by a Print+ Messenger inkjet device printing colour to the outside of the envelopes as they came from the inserter. It was an effective demonstration of Pitney Bowes White Paper Factory, with many customers now looking to use inkjet printers to do away with the need for preprinted offset shells.

Muller Martini showed off its Primera Digital Saddle Stitching system, an integrated, yet highly flexible system. This is based around the modular Primera saddle stitcher first shown at Ipex. It was demonstrated working from

a single 520mm preprinted roll on a Hunkeler UW6 unwinder with a CS1 sheeter but can just as easily run inline with a digital printer, or with widths up to 762mm as part of a SigmaLine system. It can be combined with other gatherers and a cover feeder to take and combine pages from multiple sources before passing them to
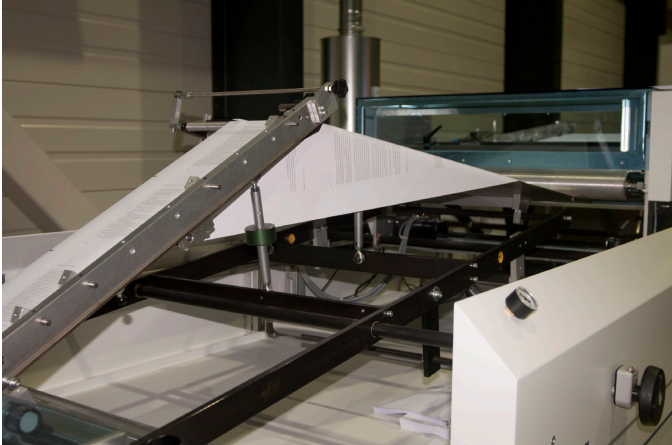
The different configurations underscored the sheer creativity involved in producing direct mail pieces.

a Primera saddle stitcher. It's also possible to add an inserting machine or a bookbinder. It takes multiple page sizes up to A3+ and runs at speeds up to 14000 copies per hour. Muller Martini claims that it will work with both traditional and digital equipment, reducing the need for multiple lines.

Neopost showed off its DS1200 production mail inserter complete with a fully integrated dynamic envelope printer. This is a modular system that will take up to 16 stations, each of which can be sheet, continuous or insert-fed. It can read several OCR formats, match database references and print envelopes.

Neopost also demonstrated the DS-140 Professional Inserter, essentially a baby version of the DS1200 suitable for a large office environment or as a short-run support system in a mailing house.

Bograma had a rotary die cutter, the BSR 550 Server, which was shown taking a sheet and die cutting it. This was working in conjunction with a Herzog + Heymann cross carrier and a Sigma Pick and Place to glue a carton-made picture of a watch in perfect register, before being

plow-folded to make a fairly typical direct mailer. It's a fast system, running at 220 metres per minute.

Conclusion

The great advantage of the Hunkeler show is that it not only provides a venue to see the latest printers, but also forces those printers to justify their price tags and demonstrate what things they are good at. It's already becoming obvious that the new class of inkjet printers are very well-suited to book production and transactional print, though there's a lot less take-up on transpromo and digital newspapers. But the main issue for these printers, as Theresa Lang, managing director of InfoPrint UK explains is to facilitate a move away from offset: "Most of what we are seeing is preprinted forms moving to white paper."

And at Lucerne we saw plenty of solutions to address exactly these kinds of issues, from saddle stitchers and book production lines, to mailing lines and envelope inserters to cut sheet stackers and the new, wider, paper handling modules. The point couldn't have been clearer – that these are the devices that drive these applications, regardless of the difference from one printer to another.

– Nessan Cleary

Family values

People have been adding inkjet heads to finishing lines for some time now but a new generation of high speed high quality printhead modules such as Kodak's Prosper S10 could really change the nature of the game.

All inkjet vendors are agreed that direct mail is one of the main target markets for the latest generation of high speed inkjet printers. It's not surprising, given that plenty of studies have shown that adding full colour variable data to direct mail pieces does result in significantly higher

John Hornby, managing director of the Lettershop Group.

responses to the campaign, and therefore higher sales, which in turn justifies the added cost of such campaigns. But direct mail does rely very heavily on adding gimmicks and special effects to grab people's attention. Most of these effects are created in postpress, and for cost and logistical reasons it's often easier to integrate the inkjet heads with the finishing lines, rather than buying in a dedicated inkjet printer.

We recently visited a highly sophisticated example at the Lettershop Group, a direct mail specialist based in Leeds, in the north of England. Lettershop started way back in 1886 as small stationery shop in Leeds with a small press in the back room. From here it developed into a long run forms printer before moving in to direct marketing in 1979. At one time the group was spread across five sites,

but moved to a single 12 acre site 19 years ago with a purpose built 140,000 sq ft factory. Yet, it's still a family run business – managing director John Hornby represents the fourth generation

Lettershop has been a Kodak beta site on a couple of occasions so it was a natural move for Kodak to suggest that the company might like to beta test the S10 heads. Hornby agreed though at first he didn't see much benefit, but as the quality improved he realised there was a considerable potential. After a year he went back to Kodak and asked for four colour heads, and though initially Kodak was a bit reluctant, today these heads are being marketed as a colour solution.

The S10 heads are based on Kodak's Stream continous inkjet technology, and are essentially the same heads that are used in the Prosper presses. Hornby says that the printheads have proven to be "very robust", adding: "We had a very good experience with the black heads so it encouraged us to go ahead with the colour heads."

Eventually Lettershop ended up with four heads mounted on a makeshift tower. Hornby says: "We wanted a digital solution to print high volume digital at a price that people would be willing to pay for, and would see the benefits in the market."

From there, Lettershop decided to have a bigger print tower purpose built, and then fitted this with eight of the S10 heads in total for CMYK duplex printing, plus four of the older Kodak 91 inkjet heads for black only. The heads are mounted on rails so that they can be positioned anywhere across the 965mm width and can also be easily accessed for maintainence. Looking at it, it's immediately obvious that Lettershop has put a lot of effort into this – there's plenty of room for further expansion, to add other features. Hornby says there's a lot more to it than just bolting in the standalone print modules: "You can't just take it off the shelf. There's a lot of intellectual property that we will not necessarily share with Kodak. And the heads are quite expensive…"

Print and finish

As a result Lettershop can now print offline with a four and a quarter inch swatch on a preprinted litho shell

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which could be up to 965mm wide. The print line includes drying and sealing, and the web is fed directly to a cutter and thence onto various folding and gluing stations

Lettershop is based in a 140,000 square foot factory.

to produce bespoke direct mail pieces. Hornby says: "Because we are running on an offline finishing system we can do all the offline finishing that we need."

In theory these heads will print at 1000 feet per minute, though for now Lettershop are running them at speeds up to 600 fpm. Hornby says: "Kodak intend to move up to 1000fpm. We have done that and you do have certain technical problems but we are confident from 400 to 600fm." Nor is there any problem with image quality as the heads offer a 175 line screen ruling. Resolution is 600x600dpi.

When Lettershop specified the tower it also included infrared dryers, which can be switched on for the whole web width, or just to dry a narrow swathe. The system has very low energy consumption. In addition, the drying is matched to the amount of ink being put on the paper so as not to take too much moisture out of the paper.

According to Hornby, the big advantage of this system is the paper stock: "You can use anything you like. We have discovered various things that allow us to move it forward far quicker than Kodak have achieved. We don't pretreat any of the paper - the smoother the surface the better the result."

The S10 heads use a single size 11 picolitre droplet, with no greyscaling. However, the operators can adjust the amount of ink that is laid on the paper surface according

to a look-up table. Hornby explains: "We have a variety of look-up tables and vary those according to the stock." The look-up tables vary the number of dots that are put down. They don't cover every single stock, but can be up to 70 per cent right for any given media, with new stocks being tested in between makereadies to develop their own tables.

Going live

Although Lettershop have been beta testing the S10 heads for two years now they have been in full production since January. The first job was for Jet2 holidays, a campaign aimed at converting those customers who bought just a flight into buying a full holiday. The campaign generated a good response, helped by the fact that the client already knew where the people were flying to and so could upsell from cheaper to more expensive holidays.

But Lettershop anticipates quite a varied market for this service. Hornby says: "One potential is catalogue covers, where you have previous purchase history and can direct people to various sections of the catalog to really drive the sale."

Other markets include offering retailers the ability to print loyalty cards, money off vouchers for improved response, or to change store data and prices, location maps etc for

These Kodak Prosper S10 heads produce 600x600dpi resolution and a 175 screen ruling.

store offers. Hornby continues: "Also personalised outer envelopes, personalised on one side and then make them up afterwards with a 2D barcode under the flap to match them back to the content. It's all about trying to drive

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Lettershop had this tower purpose made to support its eight S10 heads plus four of Kodak's older 91 series heads for black printing.

people to look and respond, to utilise the five second attention span to its absolute maximum." He adds: "In relation to a mailed piece you are lookng at a 15 per cent uplift which could be 20 per cent without the post."

So far, Lettershop has had a good response to this system, with a number of clients actively looking at how they can best make use of it.

Conclusion

Developing the tower with its eight heads has cost Lettershop some £1.5m, and naturally we wondered if Hornby had considered just buying a Prosper press. He explains: "It's a stepping stone, we've got to take clients on a journey because if you face them with a piece of white paper they don't know where to start." He adds: "I think that it's going to provide us with a natural development path in terms of personalisation."

But developing the tower with its hybrid approach also allows Lettershop to get to market now, rather than having to wait for the Prosper presses to come out. Moreover, it gives the advantages of litho printing, in terms of quality and the ability to hit a wide range of colours, combined with the benefits of full colour variable data. More importantly it also lets customers measure the return on investment between campaigns, which is vital for Lettershop to sell the idea to its customers.

In the meantime, Lettershop is about to add a second tower, complete with eight more of the S10 printheads to another finishing line, giving both greater capacity and redundancy.

As for the future Hornby says that the main issue with the printheads is the print width: "I'm sure that Kodak will go for 9 or 12ins width. You can't stitch them as yet, it would have to be built as a 9ins head to start with, but I think that's probably on the cards - they've got a 20ins press so it makes sense."

Nonetheless it's clear that Lettershop are onto a winner here. It's taken the time to help kodak develop the S10 heads into a viable product, and in doing so gained valuable insight into how to make these printheads work for its business. The trick now is to stay ahead of the game as Kodak starts to sell the heads to other users, meaning more competition for Lettershop.

– Nessan Cleary

Wide boy

Wide gamut wide format printer with built-in spectro - the HP DesignJet Z3200, put through its paces

When we tested the predecessor to the Z3200, the DesignJet Z3100, way back in 2008 it was one of the first inkjet printers using both conventional CMYK and the light version of C and M plus additional complementary

The HP DesignJet Z3200 comes in different sizes and models, for 24 or 44ins wide substrates, with or without the Adobe PostScript option. We tested the 24ins Z3200 PS model.

colours of Red, Green and Blue. This enhances the colour gamut to such an extent that for the first time we found that we could accurately reproduce fully what we saw on a high-end and well-calibrated monitor, in print.

While the Z3100 had an X-Rite EyeOne strapped in, the Z3200 has a custom spectrophotometer, made by X-Rite and with similar specifications as for the EyeOne, but more elegantly integrated into the printing engine.

In regard to colour gamut HP claimed that it could reach 80% of the colours in the Pantone spot colour series for the Z3100. With the DesignJet Z3200 HP dares to claim to reach up to 95% of the Pantone colours and are backed by Pantone on this, much thanks to the new "HP 73 Chromatic Red" ink. We can't verify the 95% number, but when analysing the ICC profiles we created we can conclude that the colour gamut achieved is about twice as large as that for offset printing, or about 800,000 colours. We can also visually see that almost all the colours of the

Pantone library are included within the colour gamut of the Z3200 (see picture below from the analysis made with the help of the Chromix ColorThink software!).

The ink set, a total of 12 inks, also includes 4 different black inks; Photo Black, Matt Black, Grey, and Light Grey. This enables the printer to produce grey balanced black and white output with smooth gradation of both highlights and shadows. On top of this you can add a gloss varnish, if you like.

The cooperation with X-Rite doesn't stop at the use of its technology for the measuring devices. HP has also complemented the previous calibration procedure within the printer driver, with a system called HP APS (Advanced Profiling System), in cooperation with X-Rite. Included with the Z3200 is the monitor calibrator X-Rite EyeOne Display 2, so you can calibrate both your printer and monitor through the APS software. Thanks to the logical step-by-step wizard, this is quite a straightforward process.

It doesn't allow for a hardware calibration of the monitor – for that you need dedicated high-end monitors, and they
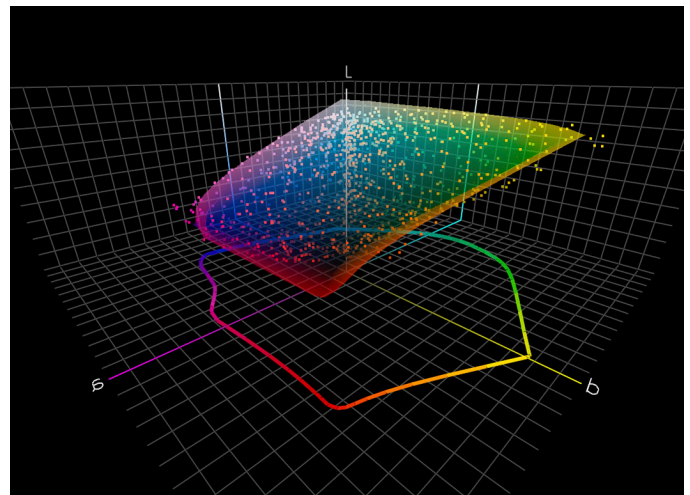
HP claims that the DesignJet Z3200 can reproduce 95% of the Pantone spot colours within the achieved colour gamut, thanks to using in all 12 inks in the ink setup. As can be seen from this figure there are only a few of the spot colours available that don't fall inside the achieved gamut (the single coloured spots represents one unique spot colour).

are usually provided with dedicated software for this. But the monitor calibration should provide a better end result than when trying to judge colours on an uncalibrated

The new calibration and profiling software HP APS (Advanced Profiling Solution) was developed in cooperation with X-Rite. It provides a straightforward way to maintain a calibrated and predictable output of photorealistic production.

monitor, of course. For us, looking at the validation of the monitor versus the printed result, it appears that the APS got a bit confused because we used the Z3200 with a monitor that had already been calibrated with another application, and the APS system couldn't recognize this. But more about that later – there is still room for improvements in the HP APS, but it a good step forward in applied colour management.

Using the printer driver

Normally we would argue that one doesn't get very far in regard to advanced colour management when only using the printer driver that comes for free with all colour printers. But for printers on the level of the Z3200 this isn't entirely true anymore. Yes, you will treat the output as RGB data, and the ICC profiles are RGB profiles strangely enough, despite the fact that the printer clearly prints with all 12 inks (plus varnish if asked for).

But when printing through the printer driver the application typically assumes that the image content is

RGB, and in HP's case the preferred choice is sRGB. The printer driver then, with the help of the created ICC profile for that ink and paper combination, makes a colour separation "on the fly" in the output process. This works well for photorealistic output, but is seldom accurate enough when producing contract proofs. For the latter you normally need a dedicated RIP, and so when using this RIP the very same printer suddenly is considered a CMYK printer.

For the DesignJet Z3200 you can either perform calibration and create custom ICC profiles through the printer driver, or as we mentioned before, via the new HP APS software. The procedure is the same – based on the existing list of paper types you recalibrate the printer and build a new, optimised ICC profile for that very printer and actual paper stock in combination. The new paper profile and ICC profile are then both uploaded to the printer itself, and to the host computer's library of ICC profiles. What the HP APS adds in functionality is to also calibrate the monitor and perform validation of the end result.

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It's obvious that using the APS is also new to the HP DesignJet product team, because APS isn't mentioned when you start using the printer driver, or reading the manual and help guides for this. The observant user will hopefully find and use the APS, bundled with the monitor calibrator, since it's a more complete solution than only using the printer driver on its own. But HP can easily help the new user on his or her way here, by updating the information concerning the printer driver and on support pages. We also had some problems performing validation in the APS software in the Mac OS X version, but it worked well in Windows 7, even in the 64-bit version.

While both APS and the printer driver do a reasonable job in calibrating the printer, it's a somewhat simplified procedure, and doesn't include functions to optimise ink amount or adjust the black generation parameters for the ICC profile. This is most likely fully on purpose by HP – it's when dealing with such matters that colour management quickly gets very complex and complicated.

Users of a dedicated RIP system however have no way around this – to fully control such an advanced printing system like the Z3200, both producing high end photorealistic production and contract proofing, optimising both paper and ink usage is crucial. And this calls for in-depth knowledge of applied colour management. We will continue our test of the Z3200 by controlling it via some of the more popular RIP systems, and report our findings from this a little later.

In conclusion, HP provides the toolset for calibrating the DesignJet Z3200 for photorealistic production of print in an office environment, or when used in a photo studio. For a mixed production of both photo prints and contract proofs, we recommend adding a dedicated RIP to drive it, as well as a high-end monitor with hardware calibration facilities. But you get a long way with the HP APS, we are pleased to report.

– Paul Lindström

Right of bills

Should a state intervene to decide the format of the invoices that companies issue to their customers?

At the beginning of December last year the European Commission issued a communication called Reaping the Benefits of Electronic Invoicing for Europe. Electronic invoicing is part of the Commission's Digital Agenda for Europe which assumes a single digital market. The EU wants to see e-invoicing become the dominant method of billing by 2020, not just for the Commission but for all businesses, large and small, right across the EU. Currently only 5% of all business to business invoicing is solely electronic so this is either going to be a big undertaking or an expensive waste of public money.

The report had a public consultation and received 87 responses to thirteen questions about e-invoicing, from a population of over 500 million people – not exactly the best advert for democracy in action! The group responsible for the communication and the thirteen questions included many banks, a handful of business associations, service providers, standardisation bodies and some representatives of the public sector. The group from which the most responses (47 %) were received in answer to the EU's questions was IT companies. SMEs (Small and Medium Enterprises) and users accounted for only 6% each of the feedback.

The communication claims that e-invoicing will help the EU to reduce its environmental impact, because it will reduce the amount of paper used and the transportation involved in delivering invoices. The eurocrats seem to have forgotten that invoice delivery happens along with the rest of the post: there is no special delivery for bills.

Techno Burden

Encouraging e-invoices is likely to lead to a greater burden than conventional billing methods for most SMEs. It requires a greater use of electronic resources for delivery and receipt, and to ensure data redundancy. There will need to be at least more than one copy of all invoices stored somewhere. The carbon impact of this additional storage will be substantial, and yet the EU

reckons that e-invoicing "could amount to reductions in CO2 emissions of one million tonnes per annum for the EU". Surely this will be outweighed by the carbon impact of the additional computing power, network traffic, and local printing required to support this model for invoice providers and end recipients?

There are a number of further issues, such as ensuring interoperability across systems and countries, the constraints e-invoicing places on design and content flexibility, the legal acceptance of an electronic bill and its integrity. Then, of course, there is the vulnerability of digital processes to wholesale fraud, not to mention incompetence given the number of misplaced customer files in recent years. Fraud is a perpetual problem, even with printed invoices, but at least with print the process is harder for criminals to replicate to create forgeries. And the horror of keeping track of audit trails, system upgrades and liabilities for data handling just doesn't bear thinking about.

Nor does the responsibility for service providers to manage and protect personal data, or questions on how to resolve issues of authenticity and trust, and of course ensuring data integrity throughout the supply chain. All of this is naturally of massive interest to IT equipment and service providers, but mostly that interest is of the slavering-at-the-mouth variety. It's also massively interesting for banks, because it provides yet another way of controlling funds in transit.

The EU's niaive assumption that e-invoicing is desirable for competitiveness ignores all of these factors, most

of which are fundamental realities for the day-to-day running of a business. But apart from its sheer idiocy in terms of its carbon impact and technological burden, the concept is fundamentally flawed for more mundane reasons.

The EU reckons e-invoicing will improve business and payment efficiencies because of the automation benefits it brings. However automation and efficiency are not always comfortable bedfellows. Automated processes

The EU's communiqué on e-invoicing is an attempt to force a mode of business on a lot of people who might prefer other alternatives. This is hardly in keeping with the EU's goals of harmony, as reflected in the twelve stars on the EU's flag. Twelve traditionally symbolises completeness and unity. This is why the number of stars doesn't go up with each addition to the community.

have very limited scope for intervention which means less control over payment processes: the digital equivalent of "the cheque's in the post" is "the funds are on their way" but, as we've all seen with digital funds transfers, they can disappear into the ether all too easily. Mostly those absent and unaccountable funds are sitting in a bank's own account awaiting processing to and from customers. It's probably no coincidence that many of those supporting this idea are from the banking business. A novel approach to raising core capital!

It Gets Worse

Conspiracy theories and paranoia aside, there are other problems with the benefits of e-invoicing cited in the EU's communication. It claims that e-invoices provide completeness of data, but why a digital invoice should be

any more complete than a printed one, which has to have an address etc in order to reach its destination, isn't clear.

The report also assumes access to the Internet. Much as this might be a desirable universal goal, the EU surely does not have the right to impose a single method of communication between consumers and end users of services, and service providers. Businesses and customers have the right to choose their preferred communications channels. The EU should not attempt to mandate how people manage business communications!

The most fluffheaded benefit the report suggests is savings in reduced printing and postage costs. There is a significant socio-economic downside if we do away with postal services and for printing system providers, which will happen if the basis of these companies' businesses gets eroded beyond the point of sustainability.

The EU also thinks there will be more efficient payment of bills which is quite ludicrous. It sees "significant economic benefits and it is estimated that moving from paper to e-invoices will generate savings of around €240 billion over a six-year period". In our experience the process of getting paid within highly automated systems is intensely more burdensome for the invoicer, with no accountability, and no means of expedited payments. For SMEs with volatile and unreliable cash flows, automated e-invoicing adds a horrendous process and data management overhead for day-to-day business, let alone data archiving and access over time.

There is also the burden of costs this silly idea places on end users. It requires the desktop printing of invoices, which is costly on a unit basis because individuals cannot benefit from the economies of scale that a print manufacturing process affords. More seriously, it puts a traditional cost of business, printing and sending invoices, onto the end user. Is this what consumers want?

The commission is now encouraging member states to develop a national strategy to promote e-invoicing. It wants states to encourage SMEs to use e-invoicing and to put together initiatives to promote it. States are expected to have plans in place for national multi-stakeholder e-invoicing meetings by June 2011.
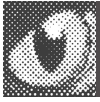
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In turn the Commission is planning a European multi-stakeholder e-invoicing conference for the next three years with delegates from member states and representatives of European industry and user associations. This meeting will be about monitoring the development of e-invoicing and its adoption in industry; exchanging experience and good practice; plus understanding problems and support requirements for more widespread adoption of e-invoicing.

Way back in 1994 the EU recommended the use of EDI (Electronic Data Interchange), a format designed for the structured transmission of electronic data between organisations. The EU's goal was to use the format to "contribute increasingly to the competitiveness of European undertakings". The uptake and use of EDI hasn't done much more than to glimmer slightly on most Europeans' horizons.

So we wonder whether this latest ruse to get people to use electronic invoices is just another attempt by IT companies and banks to increase their businesses. That's fine but it's not fine to cloak that intent in a mantle of serving the citizens of the EU. It's particularly disingenuous to suggest that somehow this will benefit the environment, and shows that voters really need to think carefully about the degree of control that governments exert rather than simply allowing anyone who cites 'environmental reasons' to do as they please. Instead, citizens are best served by allowing the market to determine its own preferences for communications with customers, whether that is bills or any other form of information.
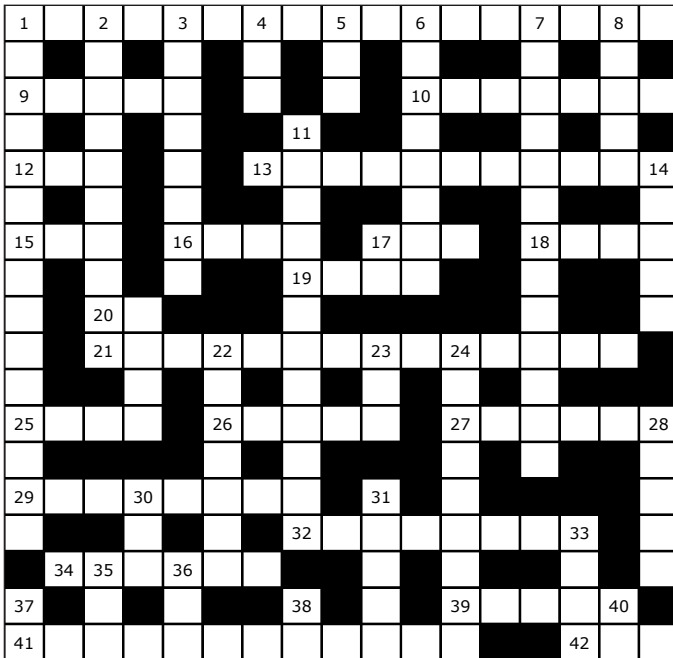
– *Laurel Brunner*

X-word Puzzle

Number 28

1		2		3		4		5		6			7		8	
9										10						
							11									
12					13											14
15				16				17				18				
						19										
	20															
	21		22				23		24							
25				26						27						28
29			30					31								
						32							33			
	34	35		36												
37						38				39				40		
41														42		

Across

1. Multiple engines in a single system? (4, 13)

9. If at first you don't succeed? (5)

10. The easiest of jobs for printers. (7)

12. An Apple laptop? Over 70% nitrogen? (3)

13. Publish in parts for an overall set. (7, 4)

15. Plural of ovum. (3)

16. First step to fixing errors or proofing. (4)

17. Over the top. (3)

18. Final letter in bozo? God?

19. Preference. (4)

20. Electronic Printing (2)

21. Popular application for high speed colour inkjet presses. (6, 4, 4)

25. 2.57 centimetres. (4)

26. Hold on tight? Verb or Noun? (5)

27. Some tricky colours to manage. (5)

29. Stimulant of uncertain properties, psychoactive and ecstatic? (8)

32. Life happens in this dimension. (8)

34. The scopes of activities, colours, mountains? (5)

39. Another word for shingling. (5)

41. Those little holes that make tearing easier. (12)

42. Is forty winks enough for this? (3)

Down

1. Preflighting, proofing, automation. All will improve these. (10, 5)

2. Tied up bitmap graphics for incremental display? In between? Shoes? (10)

3. Squish or hit these to get a piezo electrical charge. (8)

4. Useful in a pen, but not for much else. (3)

5. Internet Service Provider (3)

6. First step to troubleshoot interrelated databases. (8)

7. Stressy moment when moving from an old to a new system. (3, 6, 4)

8. Opposite of inner. (5)

11. A vital piece in the digital printing puzzle. (7, 5)

14. To strike or hit. (5)

17. Alright (2)

22. Add to what's in the envelope. (7)

23. Unit of electrical current. (3)

24. Movement of stuff and general organisation. (9)

28. The back of a book? (5)

30. Japanese unit of currency. (3)

31. Warlike male Nintendo character with an Italian name. (5)

33. Opposite of odd. (4)

35. See 12 across. (3)

36. General Post Office. (3)

37. Not down. (2)

38. A girl or some kind of technology? (2)

39. Press Association. (2)

Number 27 – Answers

S	I	G	N	A	N	D	D	I	S	P	L	A	Y	S		T
H			R		R		N		R		N		E			O
A	N	T	I	T	R	U	S	T		O		T		T	C	M
R		I		W		P		E	N	D	L	E	S	S		A
E		N		O	N	A	I	R		U		C		T		K
W	A	T	E	R		I		E		C	H	E	L	A	T	E
A		S		K	I	N		S	E	T		D		R		Q
R				D		T		I	N	E	R	T		U		
E	P	S		U		P		O		N		U	P	I		
		W		E	P	A		N		T		P		C		
F	O	L	I	O		S		Y		P			C		K	
		G	O	S	S	A	M	E	R		L		O	F	F	
W	H	E	N		E		E		I		O		S		I	
H		O	P	A	L		N		N		L	A	T	E	X	
A		R		D	O	T		T				E				
T		A	M	M	O		S		M	U	R	A	L	S		
I		N		R		I		A		O		U				
F	O	N	T		O	F	T		D	A	T	A	P	A	T	H