And hand in hand, on the edge of the sand, they danced by the light of the moon.

– Edward Lear, *The Owl and the Pussycat*

Dear Reader,

Fresh from Fespa and still struggling to recover from the Gala and awards dinner, we've been reminiscing about a great show. But far more important than looking back, is to look forward at what this show will mean for the market. Apart from its resounding numbers (nearly 17,000 unique visitors) Fespa was above all an ideas success. People went away with all sorts of interesting new business plans, from extending sign and display work into interiors, through to apparel printing and 3D finishing.

The aftermath, what happens when everyone is back in their offices and making decisions about their futures, is what good tradeshows are all about. Effective exhibitions mean visitors go away inspired to develop their ideas while technology companies get all manner of insights into what their markets want.

That handsome stranger who twirled so beautifully across the dancefloor at the Fespa Gala dinner provided the perfect metaphor. Unexpected and unprecedented new directions can be the basis for success and growth. Let tradeshow insights help your business to take new directions. And, like that wonderful dancer, ensure your fundamentals are fully fit, your planning thorough and that you can keep your balance even at breakneck speed.

Enjoy!

Laurel, Nessan, Paul and Todd

In This Issue

Kodak's Sonora Summit

Laurel Brunner went to Kodak's Sonora Summit to see how Kodak's processless plate technology is faring. With Sonora Kodak has answered most of the major questions over processless plates, which really do promise good performance whilst saving on processing time and costs, not to mention the added environmental benefits.

see page 11

Deep sea diving

Last month's Fespa Digital, held in Munich in glorious sunshine, proved to be everything that we would expect of a large tradeshow, with plenty of new kit, packed aisles and healthy sales. Here, Nessan Cleary outlines some of the main machines that were launched.

see page 15

Digital Signage

Paul Lindstrom went to the NEC Showcase in London's Olympic VeloPark to see the latest in monitor technology. It's a small show but there's a lot to see and it's well worth making the time to visit, if only to see the spectacular 36 multi-display wall!

see page 20

Regular Features & Special Treats

News Focus

HP has launched the Scitex 15000 Corrugated Press, based on the existing FB10000 flatbed that was launched last year. It uses the same HDR (High Dynamic Range), which is essentially greyscaling, and the same HDR240 Scitex Inks. It has an integrated automatic media loader that handles up to four media stacks side by side, optimised for use with corrugated sheets without operator intervention. It can run at up to 600 sqm/hr.

In addition, HP is also working on a new configuration of its T-series inkjet web presses for use with folding carton for the packaging market. HP says that it is working with leading packaging converters to validate the technology in terms of quality, flexibility and economics.

Fujifilm announced a new wide format printer, the Vybrant F1600, which is a rebadged Mimaki SUV printer. It's a 1.6m roll-to-roll device with a productivity of up to 18.0 m²/hour and guarantees adhesion to a wide range of substrates. It is a four colour CMYK machine and Fujifilm claims to be using its own patented Fuze inks. The main advantage is that there's no need to allow time for de-gassing and substrates can be finished and shipped immediately after print.

Tresu Group and Bielomatik have developed an inline coating, cutting and stacking configuration for the Océ Infinistream printer. The solution is for digital carton board and consists of Tresu's webCoat, an optimised flexo printing coating unit, and the new Bielomatik CFS di72 digital-controlled cutter, including piler with non-stop palletising.

EFI has launched its latest Fiery front end for cut-sheet digital production systems. The EFI Fiery FS150 Pro digital front end (DFE) uses EFI's HyperRIP technology, which uses four processor cores to process print jobs, and which EFI claims is up to 55% faster than Fiery-driven presses without HyperRIP. It has the same features that gained a 100% perfect pass label from VIGC's PDF RIP Audit. It also boasts a new unique greyscale composite overprint feature to ensure correct monochrome printing of overprints, drop shadows and transparencies.

Heidelberg's preliminary calculations for its last financial year, ending 31 March 2014, show the press manufacturer to have made a net profit of around €4 million, following five years of losses including last year's result of €-117m. CEO Gerold Linzbach said that the company would optimise its portfolio, adding: "Our medium-term target of achieving an EBITDA margin of at least 8 percent remains unchanged."

KBA's figures for the first quarter of this year show clear improvements to its earnings over the same period last year, with sales up 11.9 percent to €213.4 million. Demand for sheetfed offset presses has risen with orders of €146.5m, a 10.3 percent increase. However, orders for web offset presses remained 'subdued', partly due to some customers postponing deliveries.

Xaar and **Sunjet** have collaborated to develop IK822, Black MOF – a new mineral oil-free (MOF) ink that addresses food contamination fears. The new ink has been designed for use in secondary packaging applications such as barcoding on corrugated and other absorbent paper-based materials. It is approved and optimised for use with the Xaar 128 and Xaar 500 printheads.

Kodak has made a net loss of $36 million in the first quarter of this year. Kodak is split into two divisions: the

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Graphics, Entertainment & Commercial Films (GECF) saw revenue fall from $386 million in Q1 2013 to $316 million this year, which Kodak has mainly blamed on reduction in motion picture film and one-time licensing revenue; the Digital Printing & Enterprise (DP&E) division reported revenue dropping from $197 million dollars last year to $166 million this year, of which nearly two-thirds of the decline was related to lower sales in the Consumer Inkjet business.

Agfa has published its first quarter results for 2014, which show a drop in revenue from €705 million in the first quarter of last year to €622 million, with a corresponding 10 percent drop in profit to €182 million, which Agfa has blamed on weaknesses in the emerging markets and currency effects. However, gross profit as a percentage of revenue has risen from 28.8 percent last year to 29.3 percent for this year's first quarter. Agfa also benefited from strong cash flow generation.

Agfa also launched an unconditional public exchange offer on its outstanding bonds as part of a move to refinance the company. The offer related to fixed rate bonds maturing June 2, 2015 worth around €189 million. However, just €42,329,000 were tendered leaving €146,671,000 outstanding, which will remain listed on the regulated market of NYSE Euronext Brussels until their final maturity date.

Twixl Media has added its Twixl Publisher tablet application development and distribution tools to Enfocus Switch. Twixl media will also join the Enfocus Crossroads community as an Application Partner, enabling publishers and agencies to fully automate their media production processes for tablet publishing.

Enfocus has released Connect 12, its program to help designers produce PDFs capable of being printed without problems. Printers and publishers can use it to set up Connectors with all of the settings for job delivery, PDF creation, and PDF verification and correction. The files can be automatically checked against the output settings and sent to the print or electronic display producer.

KBA has joined forces with Perfecta, the world's longest-established mainstream guillotine manufacturer, to market the guillotines. KBA will work with Perfecta's existing sales channels.

Kiian has bought American distributor TW Graphics as part of its continuing growth strategy. Earlier this year, Kiian made considerable investments in its operational structure and set-up of a new production facility for digital ink manufacturing in Europe.

Global Vision, which specialises in proof reading technologies mainly for the packaging industry, has released ArtProof, a 64-bit artwork inspection software. It inspects artwork with pixel precision, increasing packaging accuracy while reducing approval times. It can detect and identify missing or added text, graphics, incorrect fonts and text sizes, as well as colour deviations.

Corel has updated its Raw photo manager, AfterShot Pro, now at version 2. This uses 64-bit processing, which Corel says makes it 30 percent faster than the previous version. There's support for more cameras and Raw formats, a newly designed interface, plus improved batch processing and a new red eye removal tool. Quark now bundles AfterShot Pro with QuarkXpress for a reduced price.

News Analysis

Canon updates press range

Towards the end of last month Canon held a customer event at its Poing site near Munich in Germany, which it used to announce a number of new production printers. Thus there's a new ImagePress C800 series of cut sheet dry toner presses, which includes both the 70ppm C700 and 80ppm C800 models, which will be available from next month. They have a monthly duty cycle of 400,000 and 500,000 pages respectively.

Imaging is via a new Vertical Cavity Surface Emitting Laser which gives a resolution of 2400 x 2400 dpi. There's also a new Consistently Vivid toner, which allows for a lower fuser temperature. It uses a twin belt fusing unit to print to stocks up to 220gsm at rated speed and can print in duplex on media up to 300gsm. There's a new multi-drawer paper deck that can blow air at different speeds, depending on the type and weight of paper, and has a new separation control system to prevent paper jams.

The C800 series will be the first printers to use the latest EFI front end, the Fiery FS150, which was announced last week and forms the basis of Canon's F200 (FS150 Pro) and G100 (FS150) front ends. There's also a PrismaSync controller option.

Canon announced a new roll-fed monochrome printer, the VarioStream 4000, aimed at corporate data centres and commercial printing companies with mid to very high print volumes. It can be configured as a simplex or duplex system, and produce from 180 to 1200 ppm. It has automatic resolution detection and supports 240, 300 and 600 dpi data streams (including mixed resolutions) without the need for intervention. The printer can also be integrated with an internal stacker to handle paper and forms, with or without feedholes, coming from stacks or from rolls.

There was also a new inkjet printer, the ImageStream 3500, which has a compact footprint designed to be 10 to 50 per cent smaller than other production systems, despite having a print width of 762mm.

It uses a new type of ink that Canon claims can print on offset coated paper stocks, without requiring any kind of primer or special treatment, which would be a significant breakthrough in high speed inkjet printing. It uses new pigments that help counter the effects of dot gain to produce sharp images, plus a new version of the Kyocera printheads that have a smaller drop size than previous Canon Océ inkjet printers.

It was shown in a 4/4 configuration and can produce 160m/min at 1200 x 600 dpi. There's no pricing for it as yet but it won't be available until next year.
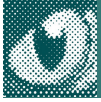
Green Shoots

It is hard to believe that we have now published over one hundred blogs as part of the Verdigris project. We recently surveyed our network of publishing partners and discovered that the blog is translated into many languages including Chinese, Turkish and Czech. The partners use the blogs in print as well as online and most of them use everything we send, which is great. This visibility is good for supporters of the Verdigris project and for keeping environmental awareness on the agenda. As always, here are the last four weeks worth.

100th Blog & Counting

We started the Verdigris blog in 2012 just before a highly successful drupa and here we are with the 100th, just following Ipex. If anyone had ever considered that there was a battle underway between the two exhibitions, it would have to be said that drupa has won hands-down. Big name exhibitors such as Ricoh and Kodak abandoned Ipex en masse rendering it pretty much untenable as an exhibition. This was great for those remaining such as Konica Minolta and Fujifilm, but as a global platform for print, Ipex disappointed. Despite a last ditch effort to turn it into a content-driven event there was no overriding theme for Ipex, no echo for the future. Worst of all, sustainability was hardly whispered, despite a barely populated area on the show floor called the EcoZone.

This is such a shame because industry events are excellent venues for showcasing print's sustainability. Apart from attracting industry players they can reach out to other players in the supply chain, and indeed this is the objective of successful exhibition organisers. This additional and, for exhibitors, otherwise unreachable audience is what makes the cost of trade show participation worth it. This is also why sustainability should be a central component of industry events: we want the sustainability message to reach the uninitiated and we want to change perceptions that print is environmentally hostile.

Changing negative perceptions of print in the marketplace is an inevitably slow business; however, progress is being

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made. For instance, carbon accountability is becoming a requirement for blue chip countries around the world, and print is obviously part of this equation. What we need now is to have sustainability on every event organiser's agenda, properly supported and with real facts about media, not just lobbyists for paper makers. Education is the only way to really make a difference, but there is still too little of it in the market. We all need to do more to get the sustainability message out there. And then environmental impact mitigation efforts might have more meaning for print buyers and consumers, helping to further burnish print's environmental profile.

In between drupa 2012 and Ipex 2014 we have covered many topics in this blog and indulged in many rants like this one. However, the goal remains the same: to get people to understand more about sustainability, and to use eco-friendly measures to improve business operations and margins. Here's to the next 100!

More than a Lottery Win

In another life I was addicted to horse racing, especially the dangerous jumping variety. As a teenager I imagined someday riding in the Grand National, the world's greatest steeplechase. Instead I find myself riding in an altogether different kind of race. But there are some curious similarities between fast and thrilling horse riding and negotiating the constantly changing landscape of matters environmental in the graphic arts.

The Grand National had its first official running in 1839 and was won by a horse called Lottery. The race has undergone

considerable changes since then and when it comes to changing perceptions of print's sustainability, we're also in it for the long haul. Attitudes to the Grand National have changed over the years, and it now attracts a global viewing audience of over 500 million people in 140 countries. Attitudes to print's sustainability and to its environmental impact have changed, with more and more companies worldwide understanding that waste and overproduction matter. Today effective waste management and production control determine profit margins.

Constantly gaining improvements in the environmental footprint of the graphic arts takes stamina, resilience and patience. The Grand National is 7,141 metres long and horses (with their riders in the saddle) must jump

Constantly gaining improvements in the environmental footprint of the graphic arts takes stamina, resilience and patience.

30 fences, before approaching a final run up of over 400 metres, longer than any other steeplechase. The distance, run up and, of course, the number of obstacles blocking knowledge development in the graphic arts is immense. Some obstacles are bigger than others and require more careful negotiation.

Developing standards to improve printing and publishing's environmental accountability is amongst the biggest obstacle for the graphic arts. It is the equivalent of Becher's Brook, a fence in the Grand National that is 1.5 metres high at take off but drops over two metres on the landing side. In each case we must always expect the unexpected, if we are to continue and complete the course.

There are often many fallers and unseated riders in the Grand National. Many environmental initiatives to improve print and publishing's environmental accountability have also come to nothing. Just as riders and horses make poor choices when negotiating obstacles, so it is in business.

In both cases a lack of knowledge and resources will lead to expensive errors. Printers and print buyers who don't have all the facts will make expensive mistakes that will cost them the race.

Understanding how to improve your business's carbon footprint takes knowledge and commitment, just as training a horse to win the Grand National does. You simply must not be scared of how big the task is, or of the opposition. This year's Grand National winner is Pineau de Re, an eleven year old owned by John Provan, who also owns a printing and packaging business. After the win he said: "It's fantastic, absolutely fantastic. We love taking on the big guys." Let's ignore the strength of the opposition and keep pushing on hard. That way we can all be winners.

Getting Energy Levels Down

Understanding technology seems to be much less important than it used to be. Stuff works in our industry because the graphic arts industry has benefited from years of technological innovation, combined with practical experience that has been fed back into research and development for new kit. This is why prepress can be fully automated and computer-to-plate production is so widespread in developed markets. Both technologies have contributed to the substantial reduction in print's carbon footprint over the last couple of decades.

That reduction has largely been incidental as printers invest in technologies that save them money. Now the focus for environmental impact reduction should be on press technologies, because this is where most energy in a print production workflow is used. Printers should be considering energy consumption in their evaluations of new press technologies, and press manufacturers should be doing more to explain power consumption. They should also be doing more to design presses to be as energy efficient as possible.

Actually it goes further than that. There should be more information about how machines are already designed to minimise energy consumption, for instance using LED UV curing as EFI does in its wide format printers, rather than

conventional lamps. And how much energy is required to pretreat or dry a substrate? This level of detail is becoming more important as print buyers start to understand more about calculating carbon footprints. It is also important as it dawns on printing companies that they can save money through reduced energy usage. Some machines are better in this regard than others, but it isn't easy to get to the facts. And facts are what's needed in sustainability calculations.

It would be helpful if press and digital printer manufacturers alike were more forthcoming about the energy consumption of their technologies, especially when they update them. The data would be helpful to printers planning their investments and it would provide facts to support print's sustainability messaging.

This sort of data would also be extremely useful for print buyers who are looking at a range of production options for their jobs. Being able to compare energy emissions of different types of press would help them to have a better idea of the emissions associated with a print media project. It might also encourage print buyers to consider the emissions associated with digital media. In the end they will most likely choose the cheapest and most effective option. But if the decision between the two is tricky, say because print gets more response, maybe emissions data will help sway the decision in favour of print.

APP Walking the Walk

Asian Pulp & Paper (APP) really does seem to be living up to its promises. When it announced its Forest Conservation Policy just over a year ago it had a serious omission: reforestation and conservation plans. This had lead to some voluble criticism from NGOs such as the WWF and Greenpeace; however, APP has now declared its plans for the restoration and conservation of one million hectares (about 2.5 million acres) of rainforest across Indonesia.

APP has come under crushing international pressure for its destruction of Indonesian rain forests, especially in Sumatra where tigers, elephants and baboons have all lost substantial areas of their natural habitat. The market's

response has been to stop trading with the company and although it has taken quite a few years, the NGO campaigns and the loss of business are working. Customers have been under pressure from NGOs to cease trading with APP because of its devastation of the rain forests. They have taken a while to work their way up the learning curve; however, now there is widespread awareness of the damage, much of it irrevocable, that APP's business model has done.

NGOs such as the WWF are not entirely convinced that APP really will do what it says, and so are advising buyers to wait and see. The APP plan reflects months of consultation with stakeholders to prioritise restoration

> ## The market's response has been to stop trading with the company and although it has taken quite a few years, the NGO campaigns and the loss of business are working.

according to biodiversity assessments. They intend to take a landscape approach, involving all stakeholders in order to work towards defined but as yet unspecified objectives, for restoring natural forests on APP concessions and on adjacent areas. The first step is a preservation effort in Jambi, Sumatra to protect tiger and elephant habitats. Plans are also under development for "identified priority landscapes" for areas where APP and its suppliers have commercial operations. These plans include the provision of wildlife corridors, support for the conservation of the Sumatran tiger, of which only 400 are thought to remain, restoring and conservation of natural forests and peat swamps in Riau.

The release is a little worrying in that it doesn't say much about specific restoration or reforestation initiatives. According to APP "… currently APP and its suppliers are obliged to set aside approximately ten percent of the gross area, equivalent to 260 thousand hectares for conservation

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purposes. The one million hectares commitment … could include parts of the ten percent legal obligation if this conservation area supports the core protected forest in each of the identified landscapes".

The company is creating a multi-stakeholder body that includes NGOs to guide its conservation and restoration policy and its implementation. It's all good. This announcement's still not enough for the market to give APP a clean bill of health, but it is a massively important step in the right direction. Let's hope Asia Pacific Resources International (APRIL) follows suit sometime soon.

For more green news, check out The Verdigris Project:

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http://verdigrisproject.com

A Review

Fespa Marvels

Fespa Digital is becoming the main event for anyone working in the digital printing industry, not only sign makers. The most recent iteration in Munich had 50 new products announced on the first day alone and by the end of day two of four, over 10,000 unique visitors had pitched up. They represented 113 countries and had a choice of 536 exhibitors to visit. A triumph that reflected the hard work and commitment of the amazing Fespa organising team and also the extremely exciting potential of digital printing, especially inkjet.

Amidst the craziness of all the equipment, software, prizes, seminars and people, a couple of technology themes were evident. First the complexity of Original Equipment Manufacturer (OEM) deals underpinning this sector risks cannibalising it, as well as providing an overabundance of engines. Secondly, RIPs and workflow systems are coming of age as ever slicker inkjet technologies drive print for all manner of new applications.

That OEM Question

The plethora of options in the wide format digital sector is down to inventiveness and the need to maximise routes to market, often through OEM deals. This has been great for customers; however, it is a model that could soon bring companies into conflict, distracting them from their customers and even confusing the market. For some companies such as Inx, nominally an ink company, this is less of a problem than for others. Inx offers bespoke output device development combining Xaar heads and whatever else is required to produce machines dedicated to specific applications, such as labels.

It offers customers three options: design your own printer and build it with Inx-sourced components, design it and ask Inx to build it, or buy a complete machine direct. Inx has 90 percent of the global metal container market, and is on a mission to convert these customers to its digital inks, through OEM and bespoke channels. The model is simple and unlikely to bring Inx into collision with any partners.

On the other hand there are relationships that have been established in order to maximise ink sales as well as reach. The best example of this is probably the Inca-Fujifilm-Screen one, but the model's in danger of setting the parties on a collision course: Screen owns Inca for which Fujifilm is the sole distributor. Fujifilm's Acuity is an Océ
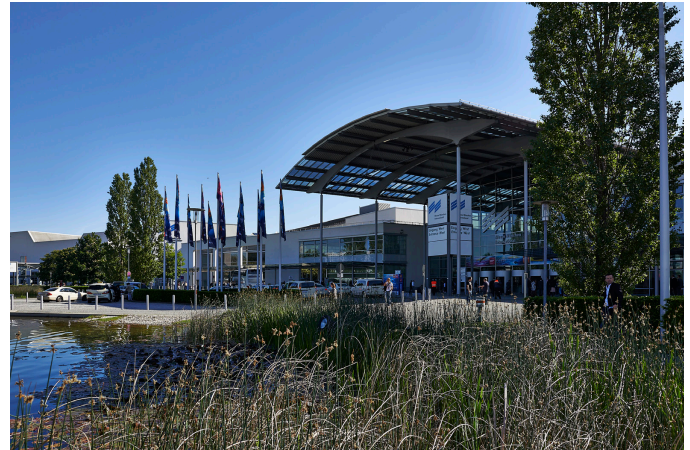
The sun shone brightly at the Messe Munich for the Fespa show.

machine with heads optimised for Fuji Sericol inks. Océ gets its workflow technology from Onyx and Fujifilm also sells the Matan technology as the Uvistar and Mimaki's JV400-160SUV as the Vybrant F1600.

It's all about ink. Customers increasingly understand that what a machine costs is all about ink costs and volumes, so perhaps they aren't as confused as we are. One large bill-board printer we spoke to buys its inks from Inx because they are about a third of the cost of HP inks. If HP sold its Scitex XP2700 at a price that reflected anticipated ink sales, it is unlikely to be too happy about this.

At some point the cost of supporting multiple samey samey machines will encourage manufacturers to cut back and focus on their core expertise. We see small signs of this, for instance in Canon/Océ's launch of the 6100 series and a new focus on industrial applications. It suggests a decision to leave the entry level and lower end of the market to others such as Mimaki, which recently intro-duced its new JV300-130/160 with new inks and heads.

Manufacturers could alternatively try to be all things to all sectors, as EFI is doing with the entry level H1625 LED and HP with its smallest, cheapest latex machine ever, the Latex 300 series. Companies could combine this model

with pushing for original brilliance and innovation. EFI is doing this with its Ultradrop 7pL greyscale printhead technology for the Vutek GS machines. For the Rho p10 HS series Durst has doubled the number of nozzles in its Quadro Array 10M heads and added LED pin curing. This is especially clever as the inks are LED pin cured, so substrates can be fragile, with UV curing completing the cure for an amazingly vibrant result. With its new Rho 312R Durst uses the Quadro Array 12M heads with high quality at high speeds.

RIPs & Workflow

Compared to the commercial print sector, wide format digital printers have a somewhat limited perspective on RIP technology and what it can do. The majority still prefer to have one RIP per engine instead of setting up fully automated systems to manage jobs and devices. EFI's customer base is the exception, benefitting hugely from EFIs Fiery technology. Agfa's Asanti is an equally robust workflow system that Agfa is turning into a produc-
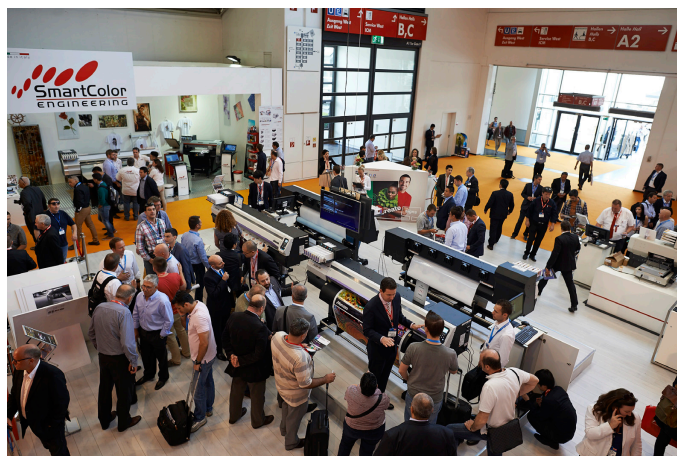
The stands were busy, as here at the Mimaki stand.

tion hub reaching from a web storefront to final output. Caldera and Onyx RIP systems are evolving into workflow systems. Caldera introduced its C4 platform which processes data at up to four times faster than Caldera's previous technology. This means that a single RIP system can be set up to drive multiple engines at rated speed.

Onyx is also trying to encourage wide format signage printers to look beyond a print driver. This company is introducing an impressive textile module for Onyx 11.1 which is based on Adobe PDF Print Engine 3.2 and will include step and repeat tools optimised for the new HP

Inx showed off this new UV printer, which uses Xaar 1002 heads and is capable of printing metallics.

printer. Onyx is moving into the workflow sector on the basis of its strength in colour management and ability to automate diverse workflows. It sells its Thrive premium product both OEM, for instance to Canon/Océ, and direct; Onyx Connect is a module that links MIS and production. The Thrive software could do with an interface makeover to bring it out of the eighties, but behind the software equivalent of big shoulders and curly hair this is an impressive system. It includes profile creation tools and clever colour gamut mapping to replace spot colours with CMYK. You can print your own swatchbooks of source colours to ensure spot colour matching, and it includes QuickSets, collections of automated tasks for commonly used workflows, that users can configure.

We saw a huge amount of impressive new stuff at Fespa, but a couple of new technologies were special: on the hardware front, Durst's LED pin curing, Screen's new 3200 UV HS and Epson's F2000 direct to garment textile printer previewed last year. For software, Agfa Asanti and Onyx are our favourites, at least for a while. Everything changes at such a speed that it has to be said this market is becoming a bit of a rat race for suppliers. And it is likely to get worse.

Kodak's Sonora Summit

When Kodak was buried in the darkness of Chapter 11 bankruptcy protection, its international divisions and the income they generated, particularly from consumables, played a major role in keeping the business going.

Now that Kodak is back on a relatively even keel, the company has started to share more about those consumables products, particularly the Sonora processless plate technology. Sonora is the successor to Thermal Direct introduced in 2005 and with which Sonora shares many characteristics.

However, the origins of Sonora do not necessarily lie with Thermal Direct. More likely they are with Scitex and Creo which merged in 2000 and which Kodak acquired in 2005, before life started to get difficult. 3M patented the first processless plate in 1995 and that year at drupa Creo showed a digital platesetter imaging Kodak Thermal Direct computer-to-plate (CtP) plates. At drupa 2000 Scitex previewed a processless plate technology imaged on Creo devices using SquareSpot thermal imaging. This imaging technology is the foundation for Kodak's line of thermal CtP imaging devices.

There are around 2000 Thermal Direct customers and over 900 have switched to Sonora; Kodak is seeing an accelerated rate of adoption. Thermal Direct is to be continued but the assumption is that customers will gradually move over to Sonora because Sonora is unique. The plate has the features of a mainstream CtP plate ie imaging speed, quality and durability, combined with environmental benefits. Sonora helps printers to save energy, chemistry and water, and can help reduced waste on press.

The big barrier to processless and chemistry-free plate technologies has been their lack of durability on press, and the fact that they haven't really been a drop-in replacement for ordinary CtP plates. Early technologies developed on-press led to fount solution contamination

and roller build up, and were not robust enough for runs over around 50,000. With Sonora, Kodak is providing a drop-in processless plate and changing the landscape considerably. Not only is this plate good from an environmental and sustainability perspective. It also makes sense economically. We are looking at a shift in the market as dramatic as the move to CtP was when printers recognised that they could do without film.

The arguments for processless platemaking have been clear for years, both environmentally and economically, but the lack of a true equivalent to the prevailing technology blocked wholesale investment into processless. As Phil Cullimore, managing director for Europe, Africa

Phil Cullimore, Kodak's managing director for Europe, Africa and the Middle East.

and the Middle East region, explained at Kodak's Sonora Summit that printers cautious to switch to processless plates should "think about all the money you could be saving if you skipped the processing step". Since its introduction at drupa 2012 uptake and conversion to the

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Sonora technology from Thermal Direct has been steady. Kodak is already ahead of sales projections for this year.

What's Changed?

The secret to Sonora is that it cracks the problem of press contamination as well as entirely obviating the processing stage. Kodak introduced its first analogue litho plates in 1959 with its first product for CtP in 1994 and has learned a lot about plate chemistry along the way. Since 1994 Rich Rindo, general manager worldwide graphics marketing and vice president of Kodak's Graphics, Entertainment and Commercial Films division, reckons that 75 percent

Rich Rindo, general manager worldwide graphics marketing, and vice president of Kodak's Graphics, Entertainment and Commercial Films division.

of printing plates imaged worldwide are digital plates: "We're on the verge in the industry of the shift to processless". Kodak's IP and experience have "got us to a very, very robust process-free product". Rindo reckons that processless technology overcomes the same barriers

that faced the move to CtP because previous processless technologies "didn't have the mainstream features the market needs". Sonora removes costs, improves process control, gets plates to press more quickly, and reduces environmental impact.

The Sonora plate technology has a single extremely thin coating (0.9g per sqm) which is some 36 percent lower that that of Kodak's original processless technology. It does not use hydrophilic resins which can contaminate fount solutions. The negative-working polymer layer is cross-linked when the plate is imaged at 150mJ/cm^2. The plate can hold a 20μ dot so it is suitable for AM and stochastic (FM) screening and for tone values of 1-99% at 200 lines per inch (lpi). The contrast between imaged and non-image areas is visible on the plate in daylight, albeit for a limited period. Sonora requires no gumming and is robust enough for over 100,000 impressions on a sheet-fed press or 200,000 plus on web offset presses. It can be used with UV inks for runs of up to 10,000.

What's in the coating layer is obviously a secret but hydrochloric acid is involved and the acids used can be cleansed and reused. Once imaged the plate requires no further processing or washing and is immediately press-ready. This is the clever bit. When the press is starting up, the coating on non-image areas absorbs fountain solution (Sonora will work with any fount solution). Once the non-imaged coating, which includes a particulate resin has absorbed the fount solution, the fount solution interacts with ink which effectively removes the un-imaged coating from the plate surface during roll-up and before maximum ink density is reached. As far as we understand in competing products such as Fujifilm's ProT, the fountain solution does this work. The ink plus coating debris transfers to the blanket, then to the substrate and out of the press as waste copies. Kodak claims this takes only twenty or so impressions.

Environmental Arguments

Processless platesetting of course makes sense because it does away with processing chemistry, equipment and water, plus the labour associated with the whole business. Kodak estimates that the commercial print industry could save 265 million litres of water by switching to Sonora. Production is more efficient and less wasteful because

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there are no variables such as the chemistry condition and temperature, and the processor settings.

Kodak calculates that based on average chemistry use, processing times and water consumption for plate processing, that the industry could save up to 6.25 million litres of plate developer, 461 million kilowatt hours and 918 million litres of water over the next three years. Waste is also cut because there is no more spent chemistry, waste water, chemical containers or remakes due to processing variables that go awry. And of course all these things have savings associated with them. For printers imaging 20,000 m² of plates per year this

Part of the manufacturing line (wet section), at the Sonora plant in Osterode, Germany.

adds up to €1,075 per month in developer, finisher and replenisher; €250 per month in chemistry disposal costs; €740 per month to buy a processor over three years; and €430 per month to maintain it. Water and energy costs associated with plate processing also go away, as do the costs of breakdowns and press downtime associated with poor plates. It all adds up to a quite astonishing €3,675 per month or €75,996 per year, every year. The water savings alone are enough to produce food for 500 - 1000 people for one year, depending on how much they expect to eat of course.

Uptake

Although the Sonora XP product for commercial printing dominates sales, the response to Sonora News for newspaper printing is positive. Zero Hora in Brazil is using Sonora News for runs of 175,000 - 225,000 and saving 45 minutes in production for more rapid distribution. In

Europe sales are also good in the newspaper sector and according to Rindo "we're not limiting where we go [with the technology]" in terms of research and development and "we believe we can get this to about 85-90 percent of applications". Kodak is working to make the plate image stronger and is already working on versions 2.5 and 3.0. Rindo adds: "We're looking to build a portfolio of process-free products" on the basis of the foundation product. New iterations would, for example, be for greater tolerance for UV inks for longer run lengths or to meet the needs of specific markets such as Japan, which is the target for version 2.5. This plate is due early 2015 and version 3.0 is expected for late 2015 or early 2016.

Kodak included a brace of customer testimonials at the Sonora Summit. Grafiche Esposti is a leading Italian offset printer doing promotional displays with a wide range of customers. According to Guiseppe Dedela, commercial manager, the company is always searching for new products and processes to keep them one step ahead of the market. With Kodak CtP and Sonora plates he says "we guarantee accurate, stable exposure and a highly productive environment". He added that "day by day operations we find no negative impact. In fact we find improvement" because of faster make-ready, sharp dots, and savings in money and time.

This is not a high volume user, with an average run length of one thousand and the occasional need for 10,000 impressions. Grafiche Esposti images 200 plates per month and reuses plates for subsequent repeat runs for some customers. Dedela agrees with the Kodak numbers on savings and has cut production times by 15 to 20 percent. More important is the improvements in overall production management, as he notes: "Our prepress department is an office environment" that took around one month to make the transition to Sonora.

In the UK Imega Printing Group has been a Kodak customer for many years. The move to processless was part of an upgrade to a new platesetter in order to handle more volume at faster speeds. Following a merger with Argent, plate volumes doubled and the combined company needed a B1 plate that was fast, performed well on press and delivered quality results. According to managing director Lynn Tosh, Imega/Argent also wanted

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a plate that delivered production cost savings and a lower environmental footprint.

The company chose Kodak because of its service commitment as well as the Lotem platesetter and Sonora plates. Tosh says the "Sonora plate inks up very quickly" to print runs averaging 60,000 to 85,000. The company uses 1,200 plates per month, a rising number and the Lotem images plates in around 2.5 minutes. Plate changeover takes five minutes. The new workflow was up and running in a week and over the last nine months Sonora has delivered: the plates are cheaper and there has been no down time for cleaning and maintenance Imega is saving over €18,000 per year on water, chemistry and waste disposal. Tosh added that the "price difference is so little [with processless] it's a win-win situation … Sonora is a winner all down the line".

Manufacturing

Sonora is produced in Osterode, Germany and at three other manufacturing plants at sites in Asia and the Americas. Ipagsa in Spain is still producing plates for Kodak; however, Kodak has invested $5 million to $6 million in capital improvements in Osterode to get its manufacturing right and to provide capacity for anticipated growth. Osterode has been shipping plates since November 2013 and volumes shipped are rising. The Kodak plant in Xiamen, China has also been upgraded to increase capacity for Sonora plate production.

The Osterode factory is amazing. Plates begin life as massive aluminium rolls which are electro-chemically grained, coated, cut, packaged and loaded onto trucks in a completely automated production line. Three 250 metre lines run in the same direction around the 350m long horseshoe shaped building to produce the plates all in the same direction. These lines produce over 2000 different plate sizes. Only bespoke plate sizes are cut offline, with everything else untouched. The factory operates four shifts 24/7 and was built on a greenfield site in a horseshoe shape for maximum efficiency. An extensive R&D facility sits in the middle of the horseshoe and chemicals are reused wherever possible. The plant's output water is top quality. The Osterode plate plant is one of the largest in the world and is certified to ISO 14001 (environmental management), ISO 9001 for quality control and ISO

Another part of the manufacturing line (wet section) at Osterode.

50001 for energy efficiency. On the 2500 m² roof there are as yet no solar panels but Kodak is considering such an investment.

Moving On

Along with competitors Fujifilm and Agfa, and indeed their customers, Kodak has been through a pretty gruelling few years. These three giants have had to undergo a massive reinvention in order to survive in a graphic arts industry that will eventually be wholly digitised. Processless plates are the bridge between conventional print and a future where digital printing accounts for the majority of printed output. For all three companies this technology provides revenue streams that will sustain them as digital press technology evolves to gradually take over more and more printing applications. For Kodak the goal is clear. Rich Rindo says that Kodak wants to be "leader in technology, leader in customers and leader in volume". This is probably a goal that each of the three plate majors wants to achieve. So we expect more processless options sooner rather than later.

– Laurel Brunner

Deep sea diving

The news from last month's Fespa Digital show in Germany is that the wide format sector is looking healthier than ever. There were a lot of new machines on show, the stands were packed and, judging by the sales, plenty of people had come to the show to invest.

Which is hardly surprising, because it costs time and money to go around a big show like Fespa. But this show really delivered, with a long list of new kit. Chief amongst these was the new Océ Arizona 6170 XTS on the Canon stand, which with a 3.5 x 2m bed is somewhat bigger than previous Arizonas. It can produce 155 sqm/hr in Express mode, or around 100 sqm/hr in Production mode. It's a

Canon launched this new, larger Arizona, the 6170 XTS, aimed at the mid-volume market.

seven colour machine, having CMYK plus light cyan and light magenta as well as white. There's also a six colour version, the 6160 XTS, without the white option. There is space to add an eighth channel in the future, should Canon decide to offer an extra white channel, a varnish or even extended colour sets.

But the real significance is that the Arizonas have completely dominated every market they've operated in, and Canon is clearly aiming for similar success in the mid-volume space.

Fujifilm will rebadge the Arizona 6100 series as the Acuity F and will therefore abandon the Inca Digital Avoset that it showed as a prototype at the London Fespa

show last year. Screen has already launched that machine as the Truepress Jet W3200UV. At this Fespa show Screen announced a faster HS version, which gains an extra row of printheads, taking the maximum throughput up from the 85 sqm/hr of the standard model to 150 sqm/hr.

Durst has also introduced faster HS versions of its P10 UV hybrid printer, but because Durst reassembles other people's printheads to make its own arrays, it's managed to double the number of nozzles without taking up any more space. Thus the P10 HS has a maximum print speed of 400 sqm/hr with the same 1000 dpi resolution. It also gains LED Pin curing, which is used to fix the inks before the conventional curing stage to cope with the faster speed.

Durst has also launched the 312R roll to roll printer, which uses the 12M Quadro array, with a fixed 12 picolitre drop size and resolution up to 900dpi. It can produce up to 240 sqm/hr or 122sqm/hr in POP mode. It's also possible to produce two 1.6m wide rolls simultaneously, side by side from different print queues. It has six colours, with a choice of different inksets according to the media. It's aimed at wallpapers, POP banners and backlits.

There's a new Rho 1300 series of flatbeds, which builds on the existing Rho 1030 but is 25 percent faster with a 1312 model that runs at up to 620 sqm/hr and a 1330 that runs at up to 1250 sqm/hr. This series uses a new configuration, that Durst calls Gradual Flow Printing, whereby the printhead array can lay down a 250 x 125cm image in a single pass. It still needs several passes for high quality images, but each pass now prints a layer across the whole width rather than just a narrow swathe, which sales manager Michael Lackner claims leads to a much smoother finish.

Besides the Acuity F, Fujifilm showed off a new addition to its Onset range, the R40i, which fits between the faster S-series, and the higher image quality Q-series that was launched last year. Marketing manager Tudor Morgan says that the Onset Q was successful in Asia, but less so in Europe, where it was seen to be too slow so this should fill that gap. It uses Spectra printheads that have a 14 picolitre drop size and maximum resolution of 1200 dpi. It can produce up to 400 sqm/hour, or around 80 beds/hour (as

against 305 sqm/hr for the Q-series and 560 sqm/hr for the S-series). It has eight ink channels so there's a choice of configurations from four up to seven colours (using two channels for white ink) and it has a modular design so that customers can change the ink configuration and adapt other elements of the printer, such as the UV curing lamps, automation, speed modes, electronics and software, to suit their evolving production needs. Fujifilm sold the first of these, plus a 3/4 automatic loader, at Fespa to ImageData Group.

Fujifilm also demonstrated thermoforming with its new Uvijet KV ink, which works with a range of substrates such as polystyrene and PETG. Product manager Mike Battersby says: "We would like to get more involved with industrial applications and the first move is the thermoforming inks." Fujifilm showed off dashboards printed by one of its customers for Minis as an example. But Morgan says that other applications could include body mouldings such as the covers for wing mirrors. For now these inks are designed for the Acuity printers, with Canon also assessing them for use with its Arizonas. But Morgan says they could also be developed for the Onset range.

SwissQPrint, which also deals mainly with the mid-volume market, brought a new version of its Nyala UV flatbed. Nyala2 gains the new Konica Minolta 1024i

SwissQPrint demonstrated an Impala UV flatbed printing an effective lenticular that can be applied to any part of an image.

printheads giving it a production speed of 206 sqm/hr (up from 140sqm/hr) that marketing manager Petra Fetting says is suitable for day to day jobs. It also has a bigger

bed - 3.2x2 metres over the previous 3.2x 1.6 metres - but Nyala2 keeps the same footprint.

SwissQPrint also had an Impala on the stand that it used to demonstrate a really nice lenticular effect, which it calls 3D Moire. Because the printer is effectively printing the lenses into the image, it's possible to limit the lenticular effect to specific parts of the image, which can be quite striking. It's not quick, but you can save time by just printing the effect where it's needed.

Agfa updated two of its Anapurna printers, with the new i-series which are prepped for integration with an ABF (automatic board feeding) system for enhanced

Agfa updated several printers including this Anapurna M2050i.

productivity and convenient multi-board feeding. The M2050i gains new printheads making it much more productive. Agfa has also added a new belt drive system and added dual board or borderless printing.

The M3200i RTR is a 3.2m wide banner printer, which was shown with dual roll capability for maximum efficiency and a new mesh option to print on mesh material without liner. It's a 6-colour (CMYKLcLm) printer and can achieve up to 116 sqm/hr output in express print mode.

Agfa also showed the latest additions to its Jeti range with the Titan S and HS models. These are 3x2 metre flatbed printers with six colours plus white. They use the Ricoh Gen5 printheads with the Titan S having one row of heads, while the Titan HS has two rows for faster printing. They use a new primer that allows them to work with a wider range of substrates such as fluted polypropylene.

Agfa also showed off its Asanti workflow, which makes heavy use of Agfa's proven colour expertise in areas such as its fast media profiling and spot colour conversion. It's also tightly integrated with Asanti StoreFront, a cloud-based web-to-print system.

EFI launched its H1625 LED, designed to be an affordable production printer. As with all Vutek printers, its a hybrid model. It has eight levels of greyscale and comes in at less than €100,000. Scott Shinlever, senior vice president and general manager of EFI's wide format division, says "We try to strike a balance between speed and quality through our range. LED gives you a wider range of substrates and the ability to run at higher speeds without the fear of the media warping through high heat."

EFI also announced a new greyscale option, UltraDrop, for its GS series printers. This is based around a Seiko printhead, with a minimum 7 picolitre drop size. Existing machines can be upgraded to UltraDrop, which involves changing the printheads. One of the first customers to invest in the UltraDrop printing was the German printer Escher & Theiss Digitaldruck, which bought a Vutek GS3250lx Pro 3.2m printer.

Mimaki demonstrated a couple of new printers, though pride of place on its stand went to the four new JV300s in the centre. These eco-solvent printers are available in

Mike Horsten, Mimaki Europe's marketing manager with the new JV300 eco solvent printer.

1.3m and 1.6m widths. The JV300 takes the SS21 solvent inks which include CMYK, light cyan, light magenta and white as well as newly-developed inks for orange and light

black to extend the colour gamut and improve gradation performance. It's also compatible with Mimaki's SB53 water-based sublimation inks, mainly for printing to polyester materials.

It uses Epson printheads with a maximum resolution up to 1440dpi and maximum speed of 105 sqm/hr. Target markets include outdoor signage, posters, interior décor and vehicle wrapping. It should be available next month.

Mimaki also showed off its new compact flatbed, the JFX200-2513. There's a choice of inksets, beween LH-100, which cures with a tough, highly resistant finish, and LUS150, a affordable UV cure ink with suppleness that extends to 150 percent.

Roland showed off its new UV flatbed, the VersaUV LEJ-640F, which is essentially the print engine from the LEJ-640 hybrid attached to a fixed bed with a print area of 1600 x 2500mm wide. It will take media up to 150mm high, which is significantly more than the normal 50mm and which Roland hopes will help sell it into the industrial market as much as the graphics sector. Besides CMYK it also takes white and transparent inks and can create impressive textures and embossing effects.

Mutoh showed the VJ-1626UH, a 165cm wide hybrid LED UV. It can run two sets of CMYK inks for higher speed, or CMYK plus white and a clear varnish. Maximum resolution is 1440dpi and the fastest print speed is 33sqm/hr.

Textile printing

Textiles remains an important part of a Fespa show. Epson took an interesting approach, demonstrating a complete textile workflow based around its new F7100 dye sub printer. Thus Epson had teamed up with the German fashion organisation Deutsches Mode Institut, which produces colour charts to help designers predict seasonal colours that are integrated into ColorDigital software to enable designers create contemporary garment designs. The workflow included two tools from Human Solutions: cad.assyst, which imports customer measurements from body scanners; and iSize, which uses measurement data from people in Europe, America and Asia to automatically

Epson demonstrated a complete textile workflow from design through to output.

adapt sizes and body shapes for specific target markets. The finished designs were printed on the F7100 and then put together via an ultrasonic welder.

Mtex has also updated its 3.2m wide textile printer with a new 5032 Pro version. This now gains a new integrated platform as well as a new feeding and take up system, which uses compressed air. There is also a new continuous ink feeding system.

Mtex showed a new pre-coater, the Mtex Pad, that runs between 30 and 140 linear metres per hour and can be used inline with the Mtex 500 and Turbo 1.8m wide printers. It was complemented by the W&D Washer
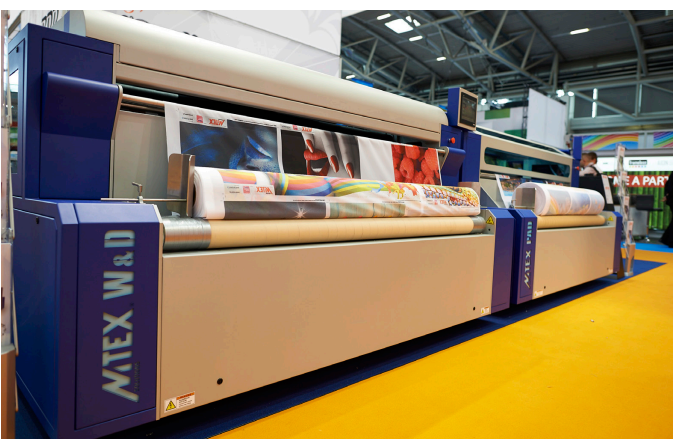
Mtex launched this W+D textile finishing unit, with the Pad primer unit next to it in the background.

and Dryer, developed specifically to emulate traditional methods of finishing fabrics for digital textiles. It has four washing tanks and a water treatment and re-use system installed as well as a dual drying system via vacuum and

cylinders which can reach drying temperatures of up to 200º C.

Durst has also improved on the Rhotex 322 with a new Rhotex HS textile printer, which Durst claims is over twice as fast. It can run at 300 sqm/hr and should produce around 500,000 sqm per year. It uses the Durst Quadro Z print array which has a resolution of 1200 dpi, with variable drop sizes of 7,14 and 2 picolitres. It uses water-based disperse dye inks, with eight colours, which are said to be suitable for up to two years outdoor use. Its roll fed, with a 330mm printing width. It's aimed at industrial uses including POS displays, indoor wall graphics, flags, banners and backdrops.

Optimum Digital Planet showed the 3.2m wide Picasso-Tex textile printer. This uses 16 1024 Konica Minolta heads giving it 2880 dpi resolution with 9 to 14 picolitre drop sizes. It's designed for industrial print applications and mass production and can reach up to 210 sqm/hr.

Finally, there were a number of cutting tables around. Esko showed off its new C-series with a C64 that's designed for 24/7 production and semi-industrial environments. It uses a carbon traverse beam and can handle materials up to 3.2 x 3.2 metres including paper and textiles up to fluted board, plastics, aluminum composites and corrugated up to triple-wall thickness.

Esko also launched a new Kongsberg V series, aimed at more entry-level customers. There are two standard configurations: one for packaging, which comes with a FlexiHead; and one for Sign and display, which comes with a MultiCut tool head that includes a camera system plus cutting and routing blades. The V series comes in two sizes: both take materials up to 1700mm long but the V20 takes up to 1300 mm wide; the V24 can go up to 3200 mm wide.

In truth, we've only scratched the surface in terms of new kit. Its easy to dismiss some of these announcements as being incremental upgrades - slight gains in productivity due to new printheads - but this misses the point. For some years the wide format industry has been split between good quality but relatively slow printers and very fast flatbeds, with lesser print quality. But this Fespa shows

Esko launched a new entry-level cutting table, the Kongsberg V.

a much greater emphasis on increasing productivity without sacrificing image quality, indicating a significant growth in wide format printing, which was reflected in the sheer number of visitors to the show.

– Nessan Cleary

Digital Signage

In tandem with wide format printing, digital signage is one of the most exciting and fastest evolving areas in media technology today. We were invited to the NEC Showcase in London, and took the opportunity to get an update on what's going on in the digital signs arena.

The NEC Showcase was part of London Digital Signage Week, which had its premier this year, and took place in the Velodrome of the London Olympic 2012 Park. Around 1500 selected visitors attended the show, and according to Simon Jackson, VP of NEC Display Solutions, this is a 35 percent increase from last year. Nearly half of the attendees are end users, and so should understand where and how the solutions on display fit in to their own applications of digital signage.

The show was split into eight main categories of applications spread over a vast area from Retail, Home, Transport Entertainment, Education, Media, Emergency

The UK vendor PSCo created a 180-degree curved display using in all 36 individual 55-inch NEC panels at the NEC Showcase.

Services to Corporate Communications. There was also an area given over to NEC Innovations, where for example new 4K monitors and projectors as well as integration with smartphones could be seen.

While several of those categories are well outside conventional media production, there are several that overlap and expand services that a modern printer or

media production company might want to include in their offerings. This could, for example, include print and publishing companies that aspire to manage cross media production and have already built up some in-house

The event was split into eight categories including Transport as seen here.

competence in database management and cross-media production, because digital signage without proper content management won't get you far. Imagine trying to implement a QR code-based campaign without a solid database behind the points of display, or an interactive sign, responding to input from the viewer through, for example, a touch screen?

A good example as to how a content database could be used in the background was shown by the Swedish vendor Smartsign. A rain sensor was used to change the signage to more relevant content when water was poured on in lieu of rain, while other more interactive content could be supported through a touch screen. Other types of sensors can be used, for example, a thermometer to adapt the signage to what the viewer is actually experiencing.

The Dutch vendor Scala demonstrated how "beacons" in a shop can send personalised notifications to mobile phones since the customers location can be pinpointed inside the shop. If the customer decides to accept the offer, their mobile can start to interact with the screen.

In general digital signage is considered to be a much more expensive media channel than conventional printed and static signage, and if this is true you would like to ensure that the different electronic displays in your campaign are

The NEC Showcase was held at the Olympic Velo Park and visitors were invited to cycle around the track.

up and running. One such solution was demonstrated by the vendor Beatpixel. This solution, called UpState, tracks what is actually displayed on the device unlike simpler monitoring that just checks if the device is switched on at all. Beatpixel calls this a "Proof-of-operation" service, which should be a welcome part of a quality management system for digital signage.

One of the more spectacular demonstrations at the NEC Showcase was, of course, the 36 multi-display wall by the UK vendor PSCo. It created a 180-degree curved display using individual 55-inch NEC panels. Other creative solutions using multi displays were also shown, and enforced the message from the show – the main limitation to what can be done with digital signage is lack of imagination. In terms of technology there is an almost overwhelming array of solutions on offer. If you have the opportunity to visit the NEC Showcase next time take it –

it's a perfect event to get a glimpse of what the trends are in digital signage.
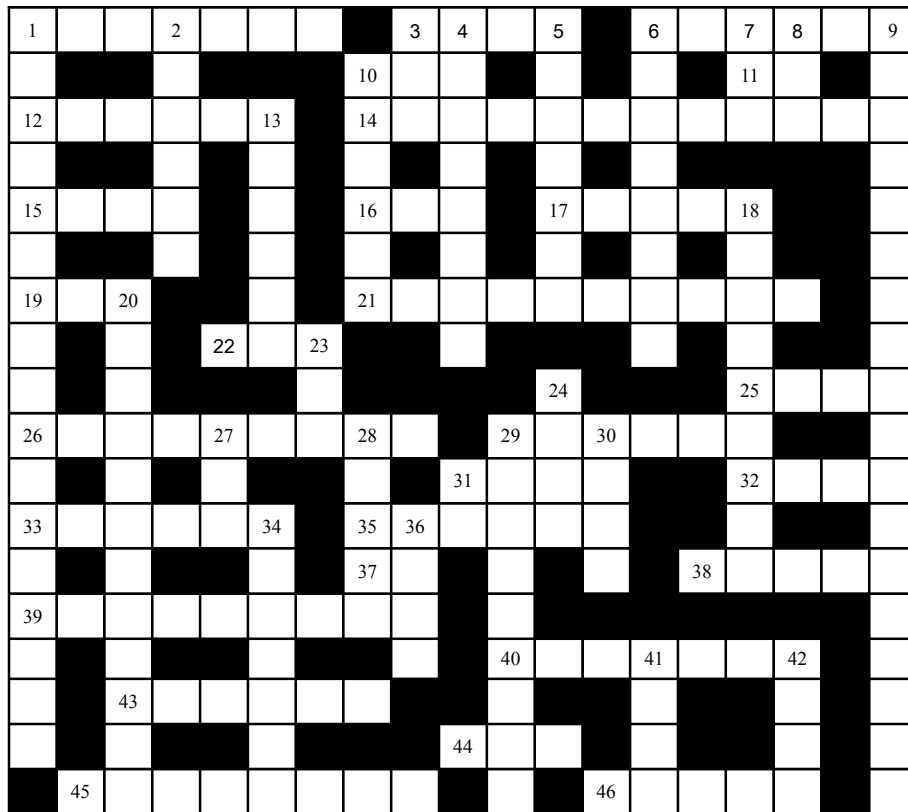
– Paul Lindström

X-word Puzzle

Number 53*

This one is pretty simple but if you get stuck the answers will be in next month's issue.

19. Objective or goal. (3)

21. Attractive and barely functional. (10)

22. Sharp and pointy for making tiny holes. (3)

25. Cain's brother. (4)

26. One cubic decimetre. (9)

29. Hidden and not yet expressed. (6)

31. Not ragged clever. (4)

32. International Association of Travel Agents. (4)

33. Non metric basis of a foot. (6)

35. He or she expresses amusement or joy. (6)

37. Intellectual property. (2)

38. Goes with a fork and spoon. (5)

39. Accepting what's otherwise objectionable or defining the limits. (9)

40. Edits or makes otherwise. (7)

43. Undercolour removal and grey component replacement. (6)

44. Devotee moves air. (3)

45. Lack of balance. (8)

46. Style or scene. (5)

Across

1. A pictorial image or words of clarity. (7)

3. Fixes or tacks in place? (3)

6. Not rough. (6)

10. The art of keeping calm. (3)

11. Not down. (2)

12. Power, vigour and effort to do. (6)

14. A place with equipment, or the process of putting it in place. (12)

15. Study excessively those strengths, weaknesses, opportunities and threats. (4)

16. Type of glue. (3)

17. Adored. (5)

Down

1. Where each pixel is a single sample, varying in intensity. (9, 8)

2. A symmetry or is that number odd or even? (6)

3. Wide format digital slang for nozzle. (3)

4. Occurrence of something, an example. (8)

5. Saddle stitcher? (7)

6. To drool or dribble in anticipation. (8)

7. Not in. (3)

8. Open Prepress Interface. (3

9. The ideal digital printing device should be able to do this. (6, 3, 9)

10. Compressed. (6)

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13. That third primary after cyan and magenta. (6)

18. Not conforming to the mean or norm. (9)

20. Do this if you want to achieve common appearance across output methods. (5, 7)

23. To allow. (3)

24. The universal language? (4)

27. London School of Economics. (3)

28. Ancient artefact or habit. (5)

29. Usually added along with a grey or a magenta. (5, 4)

30. Exam or trial. (4)

31. Chinese language subgroup. (2)

34. Small and sparkly and once upon a time an English sweet. (7)

36. Copies primates. (4)

41. That by which one or something is known. (4)

42. Protuberant inducement encourages, mostly horses. (4)

*Answers in the next issue

Number 52 – Answers

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