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US Invention Patent No.: US17033796

Used For KLD-NPG67/76/GPR53/58/CEXV49/54(Drum)

Compatible With: For CANON IRC3330/3320/3325/3320L/3520/3525/ 3530/3020/3120L/3125

CN Invention Patent No.: 202010809272.1
US Invention Patent No.: US17033796

KLD-MX310
CN Invention Patent No.: 201910495312.7
US Invention Patent No.: US16451011
EU Invention Patent No.: EP19182322.8

KLD-TN-328/626
CN Invention Patent No.: 201911341906.9

KLD-W1108A-W1103A-W1143A
CN Invention Patent No.: 201910813795.0
US Invention Patent No.: US16575369

KLD-IMC3500/MPC3503
CN Invention Patent No.: 201911189749.4

KLD-SP C352/C360/361
CN Invention Patent No.: 201910204654.9

KLD-NPG-73/GPR-57/C-EXV53
KLD-NPG-71/GPR-55/C-EXV51
CN Invention Patent No.: 2019104118810.1
US Invention Patent No.: US16/442587
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KLD-TK1200/1150/1160/1170
CN Invention Patent No.: 201811374841.3

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CN Invention Patent No.: 201910875611.3

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No. 115 | 2020

Ninestar Image's new General Manager Eric Zhang reveals keys to strategic alliances

A scaled-down domestic version of RemaxWorld Expo was held on November 20-21, thanks to the improved health conditions in China. The event saw 5,866 visitors and exhibitors participate from China. More photos on page 30.

FEATURES

Vincent Chen

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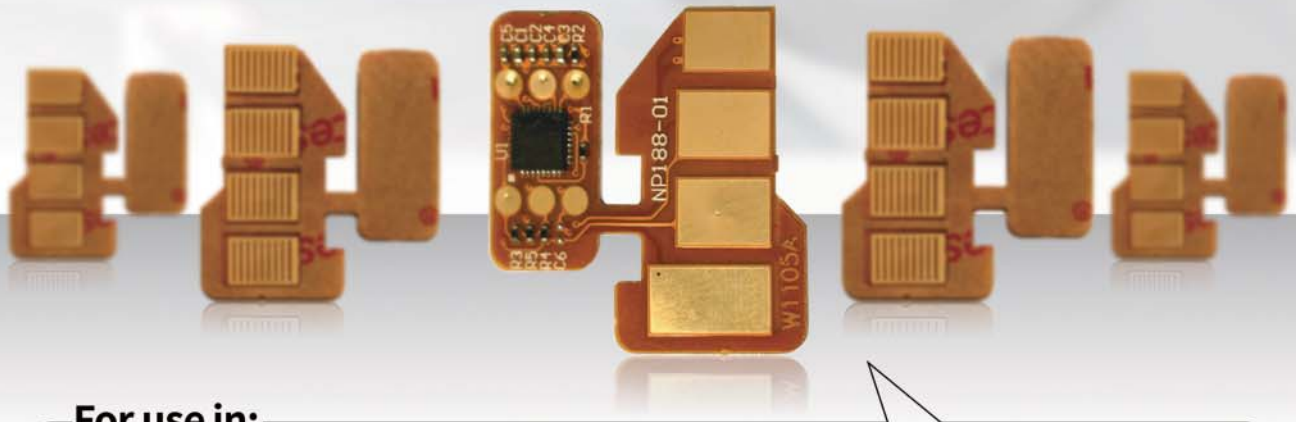

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David Gibbons

COVID has accelerated change and, here at *RT ImagingWorld*, we are not immune either. Undoubtedly, your business has been impacted too. So, we are restructuring how we will share our magazine content with you in the future.

When we began 15 years ago, we were a latecomer in the industry. We acquired the famous US-based *Recharger* magazine and the Spain-based *Consumibles* magazine. We enjoyed the world-class talent of Art Diamond. We continue to have Tricia Judge—the immensely talented industry advocate, writer and former *Recharger* editor—as our senior consulting editor.

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COVID has delivered us a bigger online audience than ever before. That's the BIG positive here. Simply put, we now have more people in three days reading our news and feature articles online than we have reading each issue of our English edition of this magazine.

Thank you for propelling us to where we are today with the largest digital audience and the largest event for the printer, copier and supplies industries.

I am humbled you have made *RTMworld.com* the market-leading, Google-ranked media website in our industry—as a quick look at *Alexa.com* will reveal. We are also market leader on social media channels. A BIG thank you for regularly visiting our pages. Please keep returning to this, our new flagship platform for news, views and stories.

We will still have a 'front cover' story of the month every month—online—featuring an industry person. We will still print magazine hard copies for *PaperWorld* (when it resumes), *RemaxWorld* and similar expos. We will still publish and distribute hardcopy editions each quarter in Spanish, Russian and Arabic with our regional partners.

We must move with the times, to work the way you do, and provide an even stronger digital platform, where you can find news and views you need to grow your business. Our stable of writers from across the globe will continue to share their stories, views and opinions. We value them, as do you.

We are not going away. We will be ever more present every day of the year providing you with news, views and stories as we have always done. I look forward to seeing you in person during 2021 as we put the COVID curse behind us and move on.

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ARMOR's Chemists L

into Highly Unusual and Ec

In October, France-based ARMOR announced it was redefining its Office Printing Division and changing its name to ARMOR Print Solutions. This change made sense, as it allowed it to strengthen its core business and integrate the semi-industrial ink business into its scope. It also brought managed print services (MPS) and software solutions into the mix, and further promote its circular economy brand "OWA."

This retooling was just another strategic move within the marketplace that the near century-old company has repeatedly made to further vertically integrate itself into the European—and global—printer marketplace.

However, ARMOR is anything but a mere cartridge remanufacturer-turned-MPS solutions provider. ARMOR and its chemists have taken ARMOR from carbon paper, thermal transfer ribbons and subsequent printing technologies into battery safety, solar power and beyond.

Much of its motivation is drawn from a quest to find environmentally-friendly solutions in all of its technologies, and thus improve the industrialization of France and the rest of the world. These are lofty goals, but the strides ARMOR has made to realizing them are quite real.

ead Expansion
ological Businesses

Tricia Judge

Judge has served as the executive director of the International Imaging Technology Council, a not-for-profit trade association serving imaging supplies remanufacturers and dealers for 20 years. Judge was the executive editor of Recharger magazine. A lawyer for 30 years, Judge also has litigation experience. Judge's work has been published in Recharger, and several other industry magazines, and has won critical acclaim for her writing and industry advocacy. She has assisted in the preparation of six friend of-the-court briefs. Judge has presented the position of the industry to the U.S. International Trade Commission. She can be contacted by email at <tricia@i-itc.org>

A Quick History

Founded in 1922, ARMOR was born from Galland & Brochard, and was the first French carbon paper manufacturer, located in Nantes, France. It weathered the great global depression and other hurdles of the industrial revolution and launched its thermal transfer technology division in 1983. In 1990, it opened its major manufacturing campus in La Chevroliere, France.

ARMOR's name was almost synonymous with office printing in France, so it used that brand recognition to get into the cartridge business. In 1992, ARMOR started remanufacturing toner cartridges, followed swiftly in 1993 with the launch of its first remanufactured ink jet cartridges. Success followed swiftly, and by 2000, ARMOR Group was an international printing powerhouse.

In 2014, a pivotal event occurred for ARMOR. The company was taken over by its employees, including its management team. "When the new management took over, the philosophy of ARMOR changed," said Gerwald van der Gijp (pictured), the managing director of ARMOR Print Solutions. "The management team took time to reexamine its mission and ask 'what can we do well? We are chemists. We are an industrial company. We know how to manage the industrial process.'" And with that knowledge, they started mapping out the new ARMOR's strategy, and the industrial world opened up to them.

That strategy was not typical growth through organic sales, nor was it through vertical or horizontal integration. Instead, the chemists were turned loose to do what they do best: experiment, innovate and create. As a result, unique products lead to unique growth. In 2015, ARMOR released EN'SAFE current collectors for batteries and supercapacitors. The EN'SAFE film protects and enhances the performance of lithium-ion batteries, which makes them safer and improves charge cycles.

Much of its motivation is drawn from a quest to find environmentally-friendly solutions in all of its technologies, and thus improve the industrialization of France and the rest of the world

Gerwald van der Gijp joined ARMOR in 2015 to head up the ARMOR Office Printing Division to prepare it for the future. Coming from HP, he is one of the few executives in the aftermarket industry that also knows the OEM side. Quickly he became a leading person in the global aftermarket industry defending reuse and the European REMAN industry. In 2020, he won an RT Global Industry Award for his work within the industry and the OWA brand and campaign.

In 2016, ARMOR sold its first 3D filaments under the OWA brand, now sold under the Kimya brand. In 2017, after almost ten years of R&D, ARMOR started selling ASCA organic photovoltaic films, and created new industrial inks and BU haptic actuators (for use in smartphones, for example). "ARMOR is a modern hybrid company, with new, novel startup divisions, with the common point of being driven by social innovation," said van der Gijp.

Offering a Three-Prong Approach

ARMOR Print Solutions now

offers alternative and turnkey printing solutions, ranging from simple consumables transactions to managed printing and the collection of used cartridges. All sales vehicles lead to the goal of reducing the environmental footprint of printing by offering ingenious and responsible consumables.

At its core, ARMOR Office Products includes the remanufacturing and retail of printing consumables. This concerns in particular laser, business inkjet and photocopier printing technologies. This business division will strengthen the circular economy strategy while expanding existing product lines and creating new solutions. All of these developments will be accompanied by value-added logistics services such as drop shipping, real-time stock visibility and electronic data interchange (EDI) deployment.

A genuine alternative to OEMs, the print cartridges produced by ARMOR are available for more than 90 percent of printers in the European market. "ARMOR has always invested in R&D and in its production facilities," said van der Gijp. "We established partnerships with key operators in the sector in order to guarantee, certify and substantiate the performance of our printing solutions." ARMOR's printer cartridges carry certifications from STMC and DIN for quality to the Blue Angel and the Nordic Ecolabel for their environmental benefits.

The chemists were turned loose to do what they do best: experiment, innovate and create.

With the launch of the OWA product line in 2015, ARMOR Print Solutions created the first all-in-one solution of print cartridges for environmentally responsible companies. The OWA range consists of eco-designed print consumables supplemented by numerous services that ensure effective end-of-life processing with lower environmental impact. "OWA stands for 'our way to act.' In other words, a closed loop approach that is addressing today's waste problems in a circular way," van der Gijp said. "We position the OWA brand like an OEM brand, with very similar marketing and channel programs, but with the opportunity to grow the resellers' profit."

The OWA line has therefore been expanded over the years, with OWA now offering users a comprehensive selection of printing solutions (consumables for inkjet and laser printers, photocopiers, franking and addressing machines and large format), supplemented by integrated services: premium guarantees for business users ensuring continuity of production, collection of used cartridges, 100 percent recoverability at end of life, and even a materials consumption report.

In this regard, OWA cartridges offer benefits and services that go beyond the OEM cartridges. They are 100-percent remanufactured cartridges, with the

Founded in 1922, ARMOR was the first French carbon paper manufacturer. Its offices in the 1950s and 2020 reflect the company's ability to adapt to market changes.

same print quality for office use, a higher yield, and at 40 percent less cost. The empties are collected at no charge and ARMOR guarantees that they are all reused or dismantled. "We have, or will find, a solution for unusable returns," van der Gijp said. "Plastic is made into rulers or 3D filament spools, waste toner is ground into asphalt, and the metals are easily resold. The OWA customer even gets a dedicated material report of the number of cartridges we collected, how they have been reused and of the environmental impact, certified by ARMOR."

All production units have the latest technologies and cutting-edge instrumentation in order to measure quality at each and every stage, from design, including component inspection and right through to the cartridge's packing and shipping.

The second component of the new Printing Solutions' Division revolves around DYALOG, a new brand in the MPS division. The program provides companies with printing solutions and software to free users from everyday constraints of printer fleet management. Printing needs are changing: DYALOG simplifies and optimizes professional printing equipment and workflows.

The final part of the new division is focused on ARMOR industrial inks, including the development and distribution of semi-industrial inks. The guiding development principles at ARMOR Industrial Inks are based on the group's fundamentals: innovation and environmental protection.

"We have, or will find, a solution for unusable returns," van der Gijp said.

ARMOR has 100 years expertise and is now looking to adapt that experience in ink formulation into new markets, products and applications. For example, inks for industrial decorative printing on glass, wooden flooring, wooden furniture and large-scale textiles. An R&D program is underway for printing on non-porous, non-absorbent substrates such as PVC, PET, BOPP, LDPE and aluminum.

All the inks are water based, providing them with excellent durability. Not only are they environmentally friendly, they are also safe for consumers and are therefore suitable for food packaging.

Most ink chemists might be inclined to rest on their laurels with such a portfolio of ink formulations and applications, but ARMOR's ink researchers have gone even further in another division devoted to inks. Highly technical industrial inks have strategic value to ensure the success of innovative applications in the fields of energy and advanced electronics. These inks with high added value can, for example, be conductive (designed for use in printed electronics), insulating, or photo-catalytic to contribute to air depollution.

"ARMOR has been able to innovate and reinvent herself several times,"

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van der Gijp said. "Due to her bold management, we have kept on growing out to become more of an international and innovative industrial company, with strong values and ethics." ARMOR created a clear branding strategy for its different divisions (OWA, KIMYA, ASCA, EN'SAFE, and INKANTO), which includes the guaranteed backing of the industrial expertise and quality of ARMOR, a strategy stated through its signature brand "ARMOR industry for people."

The Hybrid Divisions: from Ink to Infinity…and beyond

Many of the subsequent divisions created by ARMOR seem, at first blush, a natural extension of their business. However, the depth and scale of business acumen and scientific prowess required to excel in is daunting and formidable. Each year the group invests nearly €30m in industrial equipment and R&D, and it has paid off, as the company keeps on growing. Here is where the future of ARMOR, and perhaps the industry, is headed.

ARMOR Industrial Coding and Printing Division designs and produces inked films used in the technology of Thermal Transfer, a printing technology ideal for industrial environments and used for marking variable information on labels and flexible packaging: barcodes, logos, text, expiry dates and batch numbers. Such information identifies products and guarantees traceability. The global market leader, ARMOR is proficient throughout the development process, from ink design to the production and marketing of thermal transfer ribbon under the Inkanto brand. Inkanto encompasses at least 20 products to meet the needs and applications of all its customers.

Additive manufacturing is disrupting the way parts are being designed and produced.

In further pursuit of its ecological goals, ARMOR launched SolFree, the first coating process able to manufacture thermal transfer ribbons without using any solvents in 2009. This patented production process developed by ARMOR is a tangible example of responsible innovation. ARMOR recycles all inked film waste from its production site in La Chevrolière into solid recovered fuel, which is then used in cement plants to replace fossil fuels.

ARMOR has also established Rec'Pet®, a collection service offered to users for the recycling of their thermal transfer ribbons.

ARMOR's Film for Batteries Division: En' Safe® current collectors improve the safety, performance, lifespan and number of cycles of lithium-ion batteries and supercapacitors.

As the number of laptops, smartphones and electric vehicles have increased, so have the number of lithium-ion batteries. Electric vehicles, in order to gain acceptance, must have improved performance of their energy storage systems. These safety, performance and lifespan are major issues which can be improved by optimizing one of the key components of their batteries: the current collector. ARMOR designs, manufactures and markets current

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ARMOR's OPV (Organic Photovoltaic) film solution has been applied to the Cité des Congrès building in Nantes, France. (Photo credit: G. Satre.)

collectors with a coating that prevents corrosion and enhances adhesion, while reducing internal electrical resistance.

The En' Safe® current collectors designed by ARMOR aim to increase the service life, performance and safety of Lithium-ion batteries and Ultracapacitors. They indirectly contribute to the development of electric and hybrid vehicles, as well as to the integration of renewable energy into the electric grid. The need for effective and accessibly priced energy storage solutions is becoming increasingly urgent. This highly technological product is the result of advanced expertise and is the fruit of 90 years' experience.

ARMOR Solar Power Films Division: Providing solar energy to a maximum number of people via ASCA® organic photovoltaic film, the flexible and semi-transparent organic photovoltaic film serving a wide range of applications.

With the support of its globally recognized expertise in the formulation of high-quality inks and in the high-speed coating of fine layers on ultra-thin film, ARMOR has designed a photovoltaic and environmentally friendly innovation: the ASCA® film.

The unique properties of this new photovoltaic technology open up exciting new possibilities in the sectors of construction, mobility, street furniture and connected objects. ARMOR solar power films in partnership with ENGIE Entreprises & Collectivités and Nantes Métropole, deployed its ASCA organic photovoltaic film at the Cité des Congrès conference center in Nantes.

Furthermore, the end of life of the ASCA® film has been anticipated right from the design stage, making the product 100 percent recoverable, in keeping with ARMOR's environmental goals.

The ARMOR 3D Division designs formulates and introduces materials offering new mechanical, thermal and electrical properties. Through its Kimya brand, ARMOR works closely with manufacturers to meet their needs in the areas of functional prototyping, tooling production and manufacture of specific components in small runs.

Additive manufacturing is disrupting the way parts are being designed and produced. Additive manufacturing is notably used for producing parts in the aerospace, defense and automotive sectors. More than 90 materials are currently being developed at its production site in Nantes, France.

The Future is in Co-industrialization

In each of its diverse divisions, ARMOR's growth model is based on co-industrialization: the international expansion of the company as a driver for the development of the French production facilities. Co-industrialization consists of manufacturing in France and of seeking out growth beyond France and Europe in order to boost employment in France.

For ARMOR, co-industrialization means successful globalization. It is a commitment to its company and its employees. It's goal is the health of France, Europe and the globe.

ARMOR sets its sights high. However, it has 100 years of history and a portfolio of diverse companies that have succeeded because a determined group of chemists persevered. Viva la France and Viva ARMOR. ■

More than Luck:
Clover's Integration Strate

Clover Imaging Group President Eric Martin

Clover Imaging Group's Executive Chairman Jim Cerkleski

Jim Cerkleski was honored with the Diamond Pioneer Award—named after the late imaging pioneer Art Diamond— during the 2020 annual RT Imaging Awards for growing Clover Imaging from small humble beginnings in the fields of Ottawa, Illinois, to the world's largest provider of OEM-quality, remanufactured laser and ink cartridges, printer parts and the world's largest empties broker. Clover provides consumers with an alternative while keeping the marketplace open and the OEMs in check as a leading Managed Print Services provider for more than 250,000 devices. See page 31 for a list of all 2020 award winners.

gy has Put it On Top

Tricia Judge

Its name and symbol may be that of the lucky four-leafed clover, but Clover Imaging Group has never relied on fortune to guide it. It has strategically mixed organic growth with clever, critical integration choices that have left the competition far behind.

Clover Imaging Group has grown into the largest collector and remanufacturer of printer cartridges in the world. With a business model centered around sustainable innovation, Clover's high quality, environmentally friendly remanufactured cartridges enable organizations to lower their printing costs while reducing their environmental impact.

The printer cartridge world marveled as Clover, a relative latecomer to the industry, appeared out of the suburbs of Chicago and seemed to grow almost overnight into one of the industry's biggest players.

Back in the early evolution of the industry, and before branding became de rigueur, most remanufactured cartridges were packaged in a plain brown cardboard box. The company at that time was called Illinois Valley Computer Supplies. To differentiate their boxes, Illinois Valley management put a four-leaf clover on the corner of box. When Jim Cerkleski took over the helm, he changed the company name to Clover Technologies Group, and spearheaded the industry's explosive growth.

On a monthly basis, Clover collects and recycles over 3.5 million cartridges and manufactures over 1.4 million cartridges.

What's even more amazing is it mastered much of its growth through winning critical customers in the office supplies arena, such as Office Depot, Office Max and Staples. And while it originally grew through the increase in sales to such blockbuster customers, it spring boarded over its competition by strategic horizontal integration. In other words, it smartly bought up key competitors.

While the 2006-2009 recession presented most cartridge remanufacturers with difficult times, and many looked to get out…or sell out. Clover capitalized on this. The industry was already gentrifying and therefore consolidation was already underway. California-based Dataproducts was Clover's first purchase, and the addition of its stable of engineers would give Clover some real scientific depth. Dataproducts had been the subject of other acquisitions, and at the time was in the Ricoh fold of companies.

Clover's integration plans had to include empties sources.

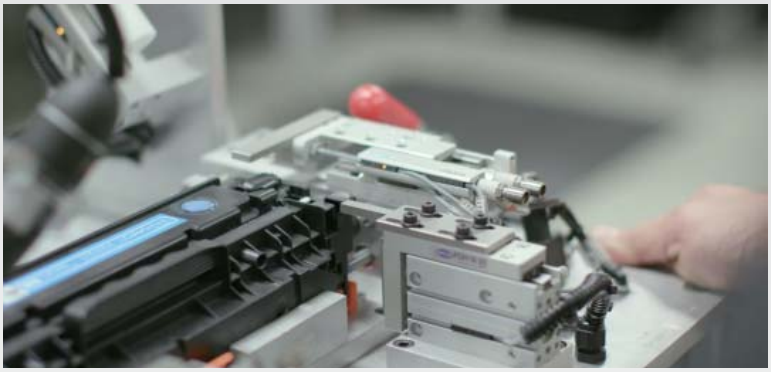
In a clear horizontal acquisition, Clover announced plans to purchase rival GRC late in 2006. Formerly known as General Ribbon Corporation, GRC was a revered remanufacturer based in Chatsworth, California. Formerly of Rochester, New York, GRC had been in imaging supplies for more than 60 years and three generations of the Daggs' family had been at its helm. GRC was the largest toner cartridge remanufacturer in the U.S. at the time.

In 2007, Clover also acquired the ink cartridge remanufacturer Cartridges Are Us based in Ithaca, Michigan. At the time of the acquisition, Cartridges Are Us reported that it was producing more than 100,000 ink cartridges each month. (Clover has now increased that production five-fold.)

During this time period, other eventual Clover acquisitions were also expanding through their own businesses through purchases. Micro Solutions Enterprises (MSE), which ultimately would be acquired by Clover, purchased California-based Laser Imaging International, along with its inkjet subsidiary, Perfect Ink. Both of these companies were producing a substantial number of cartridges and made MSE a serious force in the industry. Another critical acquisition of Clover's would be West Point Products of Valley Grove, West Virginia. With the purchase of Canadian-based Multi-Laser, Inc. of Gananoque, Ontario, West Point pushed into Canada, and made a strategic move into managed print services (MPS).

Clover was not resting on its laurels during this time period. For example, Clover acquired NER Data Products' Imaging Supplies Division. In 2010, Clover expanded into the Asia-Pacific region with strategic acquisitions in Australia. It also opened a factory in Ho Chi Minh, Vietnam, which continues to provide cartridges for the region to this day.

The best was yet to come. In a deal that rocked the imaging industry, investment firm Golden Gate Capital acquired Clover Technologies Group and West Point Products. The brilliance of this deal was that it cleanly integrated the frontrunning remanufacturer selling to the "big box" stores



with one of the strongest remanufacturers selling premium cartridges everywhere else, including the dealer channel. It also combined some of the industry's best talent into one operation.

There was no other company like it, before or since, and it was a global powerhouse. It dwarfed all its competitors from all quarters of the globe.

A Little Vertical Action: Empties and MPS

At this juncture, MPS was coming on strong. Multi-Laser was one of the first companies to invest heavily into MPS with the resulting company, Printfleet. The recession fanned the flames of the MPS fire. Many corporate buyers became interested in MPS as their budgets were deeply impacted. MPS was promoted as a way to lower printing costs, and remanufactured cartridges fitted neatly in the MPS equation.

Multi-Laser spun off PrintFleet as a separate company in 2005 and the organization was not a part of the West Point Products acquisition. However, by 2008, West Point had accessed the resources of Multi-Laser to create and launch its own MPS program: Axess. Clover has adopted the program and continues to improve upon it regularly, and has hundreds of thousands of machines under contract with its MPS program.

In order to meet Clover's sales demands that were climbing at a geometric rate, empties had to be sourced—and in significant volumes. Clover's integration plans had to include empties sources. MPS programs helped to recover empties, but never in adequate quantities. The rise of the sales online of foreign-made cartridges exacerbated the problem. Most new-build empties from China could not be remanufactured for a variety of reasons, such as quality and intellectual property issues.

Managed print services further enhances the value of well-made refurbished printers.

Luckily, Clover was once again ahead of the game. To assure a steady supply of cores, Clover acquired several empty cartridge collection companies, and brokers as part of its acquisition and integration plan. It first acquired North America's (and possibly the world's) largest empties company, Environmental Reclamation Services (ERS), in 2010. Shortly thereafter, it purchased Missouri-based Office Products Recycling Association (OPRA), the second-largest broker. In doing so, Clover became one of the largest empties' brokers in North America as well as the largest remanufacturer. Clover also contracted with critical partners, like the U.S. Postal Service, to collect empties..

Clover Moves into Printers

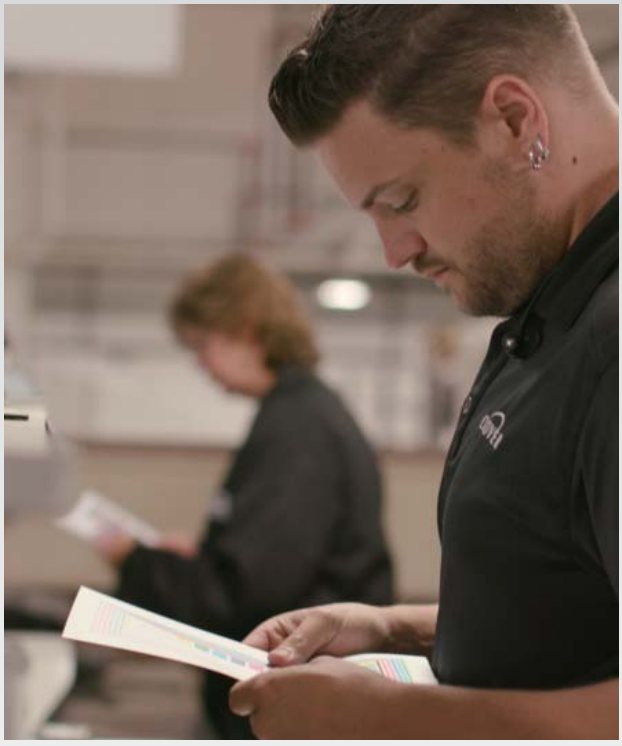
Remanufactured cartridges have been the subject of multistate legislation, trade investigations and even a U.S. Supreme Court patent case. Their benefits have been heralded and celebrated.

Remanufactured printers, on the other hand, have quietly gained a stronghold in the marketplace. All of the OEMs have their certified reused printer programs, notably among them is Hewlett Packard's certified printers.

Printers enjoying a second life are so popular, you can find them on all the major internet sales platforms. Amazon sells them in the "renewed" program. Walmart sells refurbished printers, as does Best Buy.

Managed print services further enhances the value of well-made refurbished printers. A high-quality, low-cost printer can be added to a printer fleet to lower cost per page, and then continue to keep that price low the longer it's in service.

Aftermarket companies were bound to follow suit. Over two decades, smaller, regional imaging supplies company augmented their offerings with printer repair and replacement. Larger international companies also took steps into the market.



Copier channel aftermarket leader Katun offers certified refurbished printers and multifunction devices.

Cartridge aftermarket industry leader Clover Technologies (Clover) also entered the printer marketplace, with a strategic acquisition. In February 2011, Clover purchased one of the largest, best-established printer parts remanufacturers in the country, Depot International in Farmingdale, New Jersey.

Depot International is an authorized HP, Lexmark Elite, Dell and Samsung parts distributor. It stocks an extensive selection of parts from leading brands including HP, Lexmark, Xerox, Dell, Brother and more, along with selling OEM recertified and remanufactured printers. Depot International has been the largest and top performing authorized parts reseller for HP since 2010 and is an elite authorized parts distributor for Lexmark. The company produces 30,000 subassemblies per month and has 2,000 printers in stock at any time. Having remanufactured printers in the product mix assures that Clover's dealers can deliver everything imaging that its customers might need to create and maintain a cost-effective printer fleet.

What's on the Drawing Board for Future Integration?

Clover's acquisitions, both vertical and horizontal, have been slowed by the pandemic. The industry will be forever changed by it and Clover will no doubt be ready to analyze —and capitalize— on the new industry landscape.

"While we were expecting and planning for a steady decline in print volumes and in A3 devices over the next few years, the COVID pandemic has certainly accelerated the transition to the lower-cost A4 devices," said President Eric Martin. "We are also seeing demand shift to small-to-medium business (SMB) and SOHO devices and consumables. At the same time, as businesses come back online, their number one goal is cost reduction. Clover remanufactured cartridges fit nicely into that strategy while also offering numerous environmental benefits."

Clover remanufactured cartridges fit nicely into that strategy while also offering numerous environmental benefits.

The inkjet market was the only niche that was spared the commercial agony of the pandemic, along, naturally, with PPE. Clover managed to position itself in both marketplaces in swift reaction to the pandemic and its related closures. "We are obviously seeing a much greater demand for inkjet products. Manufacturing is running at full capacity to support our partners," Martin said. "We believe that will slow some and laser will come back, but there will be a long-term shift as more businesses adopt a work from home or hybrid business model."

As Google, Walmart, Facebook, Dell and a host of other large companies have discovered, homebound workers can be just as productive as office workers. They have all issued instructions for some, or all, of their workforce to continue working from home. Clover is situating itself to be there for those workers' printing needs.

Clover and its management team always have a sharp eye out for the next big shift in the marketplace and have proven to be quick to respond. Clover maintains that position even after all that has occurred recently. "We are fortunate that even in these uncertain times, we have maintained financial flexibility," Martin said. "With that being said, we have no imminent plans for any acquisitions but are always seeking out ways to enhance and/or augment our capabilities." ■

Auto
to be

mation: ... or not to be?

—Innogetic's Henry Cheng urges industry to move to 'big data' automation without delay

David Gibbons

Just because a manufacturer boasts it has an automated production line, does not mean that company is receiving and passing on the full benefits it may have expected from the investment.

When I first moved to Zhuhai in 2010 to live and work in the heartland of the global imaging supplies industry, the enterprising owners of the companies prided themselves in the size of their workforce. After all, China had become the world's factory and it was on display with the tens of thousands that were working in Zhuhai factories on OEM, remanufactured, and then fully-manufactured compatible printer cartridges. At the time, wages were low, and it was a matter of pride to show off the size of the factory in terms of space as well as the number of employees.

However, China has changed. In less than 20 years, 400 million people have been pulled from poverty, and another 400 million now make up a middle-class owning apartments and motor vehicles—a much larger number than the total population of the United States. It's a remarkable achievement. However, wages have increased, and it is not as cheap as it was to manufacture goods in China.

Today, the same factories are quiet about the number of employees they have and prefer to share how they have embraced modern industrialization and adopted automated production lines.

Henry Cheng (pictured) is the founding President of InnoGetic Technology Co Ltd (Innogetic), an enterprise founded in 2011 to deliver effective and efficient automation solutions to a wide variety of industries, including imaging supplies.

"Automation is not new in the manufacturing world. It's been widely used and has been established in the United States, Germany and Japan since the 1980s," he said. "In some ways China is only just catching up. Because it has to." Cheng explained that as labor costs have increased, manufacturing costs have become uncompetitive and unsustainable. "There are only two ways to solve this," he said. "You move your production to a low-wage, low-cost region. Or you move to automation. Automation is the only chance for survival."

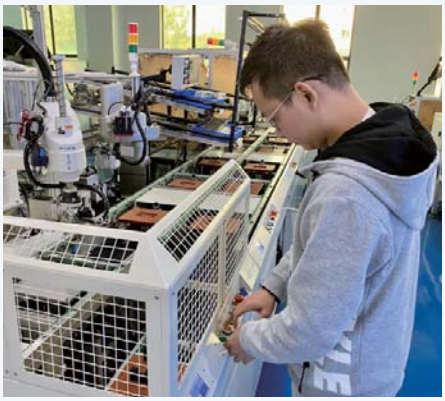
The first industrial revolution was marked by a transition from hand production methods to machines through the use of steam and waterpower between 1760 and 1840 making an impact on textile manufacturing.

The second industrial revolution, known as the technological revolution, occurred in the period between 1871 and 1914, and was due to advances in transportation and communication. "Industry 2.0 saw the world adopt mass production thanks to improved methodology," said Cheng. "This helped increase the output levels."

Industry 3.0, which was the digital revolution, occurred in the late 20th century. The advent of computers assisted the production process and machinery began to abrogate the need for human power. This is where automation came to the fore.

Quick Move to Automation

Chinese companies jumped onto the automation bandwagon later



than western countries. The Chinese government has now set targets and is providing financial incentives to drive change. Cheng is convinced, however, the need to lower the cost of labor is the real motivation for change.

"Of course, there are many more benefits," Cheng added. "Automation can deliver consistency in the quality of the manufactured product. The dependency upon human labor and human error is removed. High-end production together with high quality results are additional drivers for automation."

I asked Cheng in what ways has Industry 4.0 made such a seismic change to manufacturing and production. "Industry 4.0 is about the smart factory," Cheng said. "You could also call it 'intelligent manufacturing' and different countries have different names for it. 4.0 has only been possible because of the legacy it inherited from 3.0 and 2.0."

According to Cheng, Industry 4.0, Automation 2.0 or Intelligent Manufacturing has made a huge impact upon the industry chain. It has everything to do with the data that is captured during production that can be fed back to management. This relates to machine optimization, the meeting of targets, raw materials, as well as finished goods.

Under an Industry 3.0 model, a factory had to order all its resources and store them ready for use. With access and the speedy analysis of data, management is now able to reduce the stock being held and also reduce the amount of warehousing needed. "You can have your data linked with the raw resources suppliers in your industry chain to provide 'just-in-time delivery' to match your production needs," Cheng explained. "At the same time, your downstream buyers and customers can also be putting their needs into your system and this will drive the production lines to make the products you mostly need, when you really need it." This also reduces the need for warehousing.

Cheng claims the real value of automation is best implemented when the whole supply chain processes are considered rather than just the individual process.

Warning

For whatever reason, many senior managers have rushed to install automated production lines without really considering what they really need. "You can easily spend US$100,000 on a single step in the production process," Cheng explained. "Yet, there is the real possibility you may never get a return on investment (ROI)." Cheng has seen factories spend a king's ransom to move into automation without really understanding what they are doing, only to see the production line, or parts of a line scrapped a short time later because the product process changed.

A lot of downtime is needed when an automated line needs to have maintenance. “I have often seen a whole line shut down for days, because just one part of the line broke down and was waiting for new parts to be installed,” Cheng said. “The whole line, worth millions of dollars, was shut down.”

Production lines also have to be shut down and reset when you simply want to make a different version of the same product. “Let’s say the toner in the cartridge usually contains 200 grams, but then you want to do a 'run' with 300 grams in the cartridge," Cheng said. "The downtime could be many hours while the changes are put into place.”

In his view, Cheng believes the best way forward for industrial evolution, especially in China, is to jump to Industry 4.0 with the introduction of “Big Data” informatization in the production process. At that stage, he and his team at InnoGetic look at transitioning a manufacturer from the Industry 3.0 model to ensure the ROI benefits are achieved having given consideration to technology maturity and the product life cycle. “Sometimes, integrating people with machines may provide higher efficiencies, more stable and higher production levels and a solid ROI than a fully-automated line, in some circumstances," Cheng said.

“The smarter solution for automation may be to have the flexibility where humans work with the machines. The middle level engineers are still analyzing the data, resources still arrive just-in-time, but when a particular part of the line needs service, or where it is simply more cost effective to have humans completing a specific task, the manufacturing process is not held up," he said.

Cheng said this model also provides a shortcut for manufacturers wanting to enter the game with less investment in time and money.

Apart from Cheng himself, InnoGetic has staff with world-class experience with the top 500 global enterprises in Europe and the U.S., industrial and engineering experience with supply chains and management, and the knowhow to maximize production output to gain true competitiveness.

“InnoGetic can really help here,” Cheng said. “We work simultaneously with management and challenge them to consider what they really need, design a system where humans and machines work side-by-side, and then work with them to monitor and analyze the data, tweak the processes and then deliver good quality results, profitably.” ■

Successfully Pi
the Big Picture

ecing Together

—The strategy provides toners, chips, components and finished goods to deliver more choices for the aftermarket

David Gibbons

Dinglong, the well-known chemical toner manufacturer based in Wuhan in Hubei province celebrated its twentieth anniversary in 2020.

Formerly Hubei Dinglong Chemical Co. Ltd., Hubei Dinglong Co. Ltd (Dinglong) is publicly listed in the Growth Enterprise Market at the Shenzhen Stock Exchange in China (300054.SZ). As such, it was the first to be listed in the Chinese office consumables industry. Initially its main products included color polymer toners but has broadened its supply chain to include consumables chips, developing rollers, remanufactured and new-build cartridges for laser printers, and in more recent times for inkjet printers as well. The Zhu brothers, including Shuangquan Zhu (Chairman of the Board) and Shunquan Zhu (General Managing Director) have worked hard to position the company to provide the global and Chinese domestic markets with a one-stop solution.

"It does not matter if you need toners and chips and other components, or finished goods, inks or toners, remanufactured or newly-built cartridges, we are well able to deliver more choices for the aftermarket," said Shuangquan Zhu (Pictured left).

Among the many subsidiary companies are leaders that support the vision to provide a serious alternative to the other industry giants providing solutions. Having integrated the upstream and downstream industrial chain by capitalization, well known company brands like Hubei Dinglong Chemical Co., Ltd (Dinglong Chemical), Zhuhai Mito Color Imaging Co., Ltd (Mito), Shenzhen Retech Technology Co., Ltd (ReTech), Hangzhou Chipjet Technology Co., Ltd, (Chipjet), Speed Infotech Holdings Limited (Speed) and Zhuhai Topcolor Image Products Inc (Topcolor) play an important part in the combined strategy.

In order to be accepted globally, the company as a whole was invested heavily in the research and development of its own patented solutions that do not infringe the intellectual property of the printer OEMs. Hubei Dinglong Co., Ltd owns 886 authorized patents domestically and internationally.

Financially, the company continues to gain strength. Its 2020 third quarter results revealed year-over-year increases in income and profits despite the global pandemic. The company reported operating income of ¥443.050 million (US$66 million) for the reporting period, a year-on-year increase of 57.47 percent. Net profit for the period was ¥40.91 million (US$6 million), a year-over-year increase of 36.08 percent. In a statement to shareholders, the company added: "With the gradual implementation of the company's strategic layout in the printing and copying consumables industry and the smooth development of its ink cartridge business, the company's product structure adjustment has achieved expected results."

Leaders among the Dinglong group agree that the company's four principles that makes the industry chain work, are:

- putting the customer first;
- facilitating innovation;
- exhibiting equal core values; and
- collaborating forever.

For the future, Dinglong will keep a focus on its core business block as always and to demonstrate to the global market it can provide a real choice when it comes to supplies, whether that be components or finished goods. "We will continue to penetrate the industry downstream and also further explore the field of microelectronics materials and precision machinery to establish the 'bipolar business mode' of development in both the office consumables and photoelectric materials industries.

www.mito.com.cn

Mito: the color expert

Wendy Duan (pictured) is General Manager of Mito. "Our mission is to bring Mito to worldwide customers who are passionate for colors," she said. Founded back in 2003, Mito joined Dinglong in 2013 in a collaborative acquisition. "Dinglong started when the industry was all monochrome and color was missing," Duan said. "So, Mito positioned herself as a professional, remanufactured, color toner expert." Duan says that the mission has not changed and there are no secrets other than remaining focused on delivering the industry's best color toner cartridges.

According to Duan, being downstream from premium toner supplier Dinglong Chemical gives it a lot of upstream power with its distributors and channels. "When Chipjet and Dinglong New Material joined the party, they provided additional strengths with chip and core accessories," Duan said. "Now we serve customers in more than 80 countries and areas.

Duan proudly asserted that more than 80 percent of the work force is female, and they are more than competent in meeting targets and excellence in production quality pressures every day. "We hope the Mito story can encourage women in this industry to work hard in their respective business fields," she said.

Retech® www.retech.com.hk

Retech: the customer first

Steven Wang (pictured) is Sales Director of Retech Technology International Limited (Retech) which was founded in 2001 in Shenzhen China. The company has mostly focused on the manufacture of compatible, new-build, monochrome printer cartridges and gained a valueable global reputation over 19 years.

"We are a customer-oriented company," said Steven Wang. "Our customers' satisfaction always motivates us forward. We are continuously innovating and have developed 'patent -safe' solutions and run an automated workshop to obtain higher efficiencies. All this occurs so Retech can passionately pursue a 100 percent satisfied customer experience."

According to Wang, being part of an in-house, integrated supply chain has allowed it to develop compatible W1105A, 1106A, 1107A and 1110A toner cartridges with its own uniquely developed chips, its own designed plastic shells, and its own key rollers. "This is how we support our customers with good value, " he said.

In 2020, Retech extended its compatible, new-build, laser cartridge factory to 42,000m^2 inside the Dinglong industry zone in Zhuhai—equipped with an automated workshop with production lines and a smart system to be more efficient.

"We are creating the future, today," Steven Wang said. "The future is what we create today." Wang is committed to the Dinglong industry chain because the benefits of components and tech-support translates into a better customer experience.

鼎龙汇杰 PRINT-WELL

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Printwell: delivering choice

Paul Dong (pictured) is sales director of Dinglong Printwell Technology (Printwell). This is a new enterprise for the Dinglong group and was established in 2019 with a wealth of experience gathered from Dinglong subsidiaries. Printwell focuses upon manufacturing compatible, new-build inkjet cartridges.

"It's all about giving choice," Dong said. "We are delivering a choice." According to Dong, the compatible new-build inkjet segment market is monopolized by a small few and he wants to position Printwell as a quality manufacturer that provides choice for global customers.

"I have been in this business for ten years and the factory I have helped to establish covers 10,000 m² with more than 200 experienced workers," Dong added. "Our customers are already benefitting from the fully automated production lines, higher efficiency and stable quality control that cannot be provided by human labor production lines."

"One reason for Printwell's rapid growth, is the support we get from other parts of the family." Dong pointed out. "Our parent and sister companies provide the injection moldings, the chips as well as other key materials. You have no idea how good it is to be part of the mature, reliable vertical industry chain within the Dinglong group."

SPEED Green the Future speed-china.com

Speed: remaining focused and keeping ahead

"We were founded in 2001 as a pioneer in remanufactured inkjet cartridges and started production in 2003 in Shanghai," said Benjamin Young (pictured), cofounder and General Manager of Speed Infotech Holdings Limited (Speed).

"It took us just five years to become a leading inkjet remanufacturer in China," he said. In 2013, the decision was made to shut down the ten-year-old factory in Shanghai and move everything to Beihai. "Sixty large trucks travelled 2,000kms to transport all the machinery across the country," Young said.

Then, in 2015, Speed was the first to gain a license to import used inkjet empty cartridges into China. Gaining this importing license set a new standard within the Chinese industry. In this way, Speed raised the industry bar, especially with remanufactured products in China.

Today, Speed joins the Hubei Dinglong Group as an essential part of the group's supply chain. "We closely work with Chipjet and other component supplier factories in the Dinglong group and this enables us to develop better products and solutions for our customers," Young said.

According to Young, joining Dinglong is like aerial refueling. "We do not need to stop. We can provide consistency and reliability for our customers. This allows Speed to remain focused on our markets and to continuously be creating value for customers."

www.top-color.com.cn

Topcolor: delivering premium for the customer

Zhuhai Topcolor Image Products Inc (Topcolor) was established in 2008 as a manufacturer and supplier of remanufactured inkjet cartridges.

Joe Lee (pictured) is sales director of Topcolor and has worked in the aftermarket for more than 30 years focusing on international business particularly in Europe and America—with Topcolor.

"We have two plants—one in Zhuhai and the other in Beihai—which occupy 22,000 m^2," said Lee who hails from come from Hong Kong.

Lee enjoys introducing the modern Topcolor factory to worldwide customers, "We have a high-standard, recycling system for every single cartridge," Lee explained. "Nowadays remanufacturing is an industry that is highly certified and licensed, but it means Topcolor can continue to focus on the long-term development of its remanufactured inks!"

Chipjet en.chipjet.com.cn

Chipjet: innovation and reliabilty

As a young and brilliant tech company leader, Martin Wang (pictured) has never slowed his pace for moving ahead. His goal is to lead Chipjet Technology (Chipjet) to become first-class chip solutions provider, professional design house and a trusted partner.

Founded in 2007, Chipjet focuses on the design, development and production of printing consumable chips which possess the company's independent intellectual property products having achieved 280 patents.

"Based on the values of innovation, effort, excellence, and win-win, Chipjet will consistently pursue breakthroughs and innovations in technology, management, service, and product quality," Wang said. "We strive to fulfill the responsibilities and obligations as an industry leader we have become."

Chipjet claims it can actively meet market and customers' needs and continues to invest in being a first-class chip solutions provider and trusted partner, and a vital partner and supplier to others in the Dinglong group.

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Industry Breakthrough Award
—Apex Microelectronics

Outstanding Awareness Campaign (Printers)
—Chipjet Technology

Outstanding Awareness Campaign (Copiers)
—ARMOR Print Solutions

Quality Leader Award (Copiers)
—Delacamp

Quality Leader Award (Printers)
—Megain Technology

Technology Innovation Award
—Kilider Technology

Environment Betterment Award
—Print-Rite Pelikan Solutions

Industry Issues Solv Thanks to Partnersh

— Ninestar Image's new General Manager Eric Zhang shi confidence and enthusiasm

David Gibbons

When you arrive at the gates of the Zhuhai headquarters for the Ninestar group, you cannot help but see the Chinese flag flying proudly in the midst of the Ninestar, Apex, Pantum, Static Control and Lexmark banners.

Nor can you help but think how meteoric the rise of this company has been in just 20 years. It hasn't happened by accident.

On October 13, Eric Zhang was appointed the new general manager of Ninestar Image. Zhang has spent an 18-year career with Ninestar in which time he has built up an extensive experience and knowledge of the company group and the global imaging industry. He replaced Jason Wang in a restructure that will see Wang head up the Consumables Business Unit for both domestic and international sales. Eric Zhang will also hold the position as vice general manager of that same unit. Jason Wang will continue to head up Apex Microelectronics (Apex), which is a sister company to Ninestar Image and will continue in his role as senior vice president of Ninestar Corporation. Jackson Wang continues to be the Chairman of the total Ninestar Corporation, which includes Ninestar Image, Apex, Static Control, Pantum and Lexmark.

Eric Zhang | Jackson Wang | Jason Wang

When I met up with Zhang, I could sense a mixture of concern and excitement.

On one hand, he is fully aware of the big issues confronting the global industry. "Our customers are fed up with the OEM firmware updates being pushed through to printers that lock out third-party supplies. They are also looking for additional products to sell to their existing end-user customers as a way to grow their businesses," he said.

On the other hand, he is excited about the opportunities afforded as a result of the strong relationships Ninestar Image has with its vertically and horizontally integrated

ed ips

nes with

Eric Zhang holds the first "black box" UFU that can update the software on cartridge chips in a matter of seconds without having to remove the cartridge from its packaging

The launch of the G&G printer in September, made Ninestar G&G the fiirst aftermarket consumables brand to provide a one-stop solution for buyers with hardware and consumables.

partners. The divide between OEM and the aftermarket was crushed with Static Control and Lexmark joining the Ninestar group in 2014 and 2016, respectively. Each brought its own skill set that has provided new opportunities for the group.

Further, Zhang's appointment was based on his educational background as an engineer, his abundant work experience and his familiarity with the operations and management of supply chains.

Excitement Over Firmware Update Solution

Zhang is visibly confident about a new solution for the current wave of OEM printer firmware updates that cause the printer to reject any third-party supplies being used. "This is an immense frustration for our dealers, distributors as well as end-users and I am committed to delivering quick, effective and practical solutions," Zhang said.

Zhang has a solid sisterhood of companies to fall back upon. Apex, for example, is a market leader in the development and manufacture of chip solutions. Ninestar Image has partnered with Apex to develop, manufacture and introduce the Unismart for Firmware Upgrades (UFU) solution.

"UFU is revolutionary," said Zhang, who is holding a box-like device that has been engineered through the strategic relationship between Apex and Ninestar Image and its G&G brand. "This simple device will allow our partners and distributors to update a chip on a cartridge in its unopened packaging in a matter of seconds.," he said.

Zhang is obviously excited. As an engineer, he can understand the amount of work that has had to go into the research and development of such a device. As he demonstrated the device to me, he said, "The G&G branded package containing the cartridge is specially designed so the UFU device can touch the cartridge chips without you needing to open the box." This means there is no downtime involved in the opening of thousands of packages in warehouses. No need to physically remove and replace chips. No need to repackage the cartridge ready for the end-user.

The UFU device is connected by WiFi to the internet and is able to download the latest coding needed to update the cartridge. A thermal printer, attached to the UFU, prints out a new QR code sticker that can be placed on the packaging to show the version of chip inside. A camera can scan the code to verify the updated cartridge. The solution is being rolled out now.

Excitement Over One-stop-shop Solution

Zhang's enthusiasm is palpable. "I know OEM products very well and I want to deliver a 'one-stop-shop' with a range of OEM-quality products for our global customers. This includes printer solutions as well as finished goods and components," he said.

Ninestar Image has claimed to be the first aftermarket brand to provide branded printers and copiers as well as consumables and supplies for the global market. G&G has the OEM experience of its Pantum and Lexmark sister printing companies to draw upon.

The Ninestar group's new hi-tech printer park investment in Zhuhai, when completed, will be the largest plant in the world to manufacture printers for a wide variety

of brands including its own Lexmark and Pantum printers. And it will roll out Ninestar Image G&G's own branded devices there as well. It has already launched the P4100 A4 monochrome, single-function desktop printer and the M4100 multi-function laser printer. The P4100 and M4100 series are designed to benefit the SOHO and SMB market sectors by offering an efficient, convenient and money-saving printing experience. The company will soon have a series of refurbished copiers as alternatives as well targeting MPS markets.

Despite the predictions the post-COVID demand for printing in the office will decline, Zhang noted that office staff will not disappear even if they are not seen physically at the office. "Those working remotely from home still need printers and our solution uses a smaller footprint with the ability to be centrally managed in terms of security as well as supplies." Zhang added, "G&G will keep our partners ahead of the game by extending our product portfolio with a hardware and supplies combo. This is a tempting and value-add solution to help our global partners to grow their businesses."

Zhang said he has been honored to be appointed as leader of the Ninestar Image team. "I'm confident my understanding of customer needs coupled with my experience in this industry can help the company and our customers to evolve and capitalize on the changing market conditions," he said.

Jason Wang, General Manager of Consumables Business Unit, Ninestar Corporation, said, "The breadth and depth of Eric's experience with our group partners and the industry, along with his passion and commitment to our customers, places him in an excellent position to drive our business growth and sustainability." ■

Ninestar Corporation: www.ninestargroup.com
Ninestar Image: www.ggimage.com
Apex Microelectronics: www.apecmic.com
Pantum: www.pantum.com
Static Control Components: www.scc-inc.com
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5 QUESTIONS

Investment in the Supply Chain is a Key to Success

—HYB's President Vincent Chen who founded his copier supplies and parts business in 1998 claims success can only be achieved one day at a time

How important is the need for a strong supply chain for your business?

As a manufacturer, it is critical to have proven quality materials from our suppliers available when we need them for the 2,770 SKUs that we manufacture. There has to be a seamless connection if we are to be efficient and cost effective. This is also true for our remanufactured product range that includes photoconductor units and copier machines where a certain proportion of the materials come from abroad. The most important factor in our supply chain is to maintain quality consistency as part of our Material Requirements Planning (MRP).

How did HYB achieve a reliable and consistent supply chain?

We all know the saying, "Rome was not built in a day." Since 1998, HYB has taken the time to build strong communication channels and form solid agreements with each of its suppliers, most of whom are abroad. At the same time, HYB has developed an independent quality system that requires our suppliers to maintain the consistency of their materials. We provide them with reliable and accurate forecasts. If there is any product failure, goods are rejected and that causes a delay. No one wants or needs this. So, we painstakingly unite and grow with each of our supply chain partners. It is reflected in the mutual trust and growth in sales between our distributor customers, HYB and our suppliers.

To what lengths do you go to with your supply chain to deliver benefits to your customers?

Our suppliers know they must meet the very high standards we set. So, the relationship between HYB and our supply chain is more than just "buy-and-sell," but also to meet the specifications and standards for each and every component. We have suppliers that develop products exclusively for HYB that meet higher standards. This is how we isolate our premium quality standard from being copied by our competitors. The consequence of working hard with each individual supplier in the chain means we can keep our customers competitive in the market in terms of a premium product range, added value quality, service as well as a good price.

How does the new relationship you have with a Japanese toner supplier impact your supply chain?

As HYB has continued to establish a good reputation as a leading manufacturer and supplier for copier consumables and parts, we have had many competitors watch us closely. Our modern laboratory is purposely-built with an experienced team of technical professionals to research and develop copier toners and spare parts. Most of our competitors fill their copier cartridges with existing formulations regardless of how well the products perform. Here at HYB, we have invested in our supply chain to develop customized, exclusive formulations with our Japanese toner partner. In 2020, these toners have been independently tested and awarded for their superiority in the market.

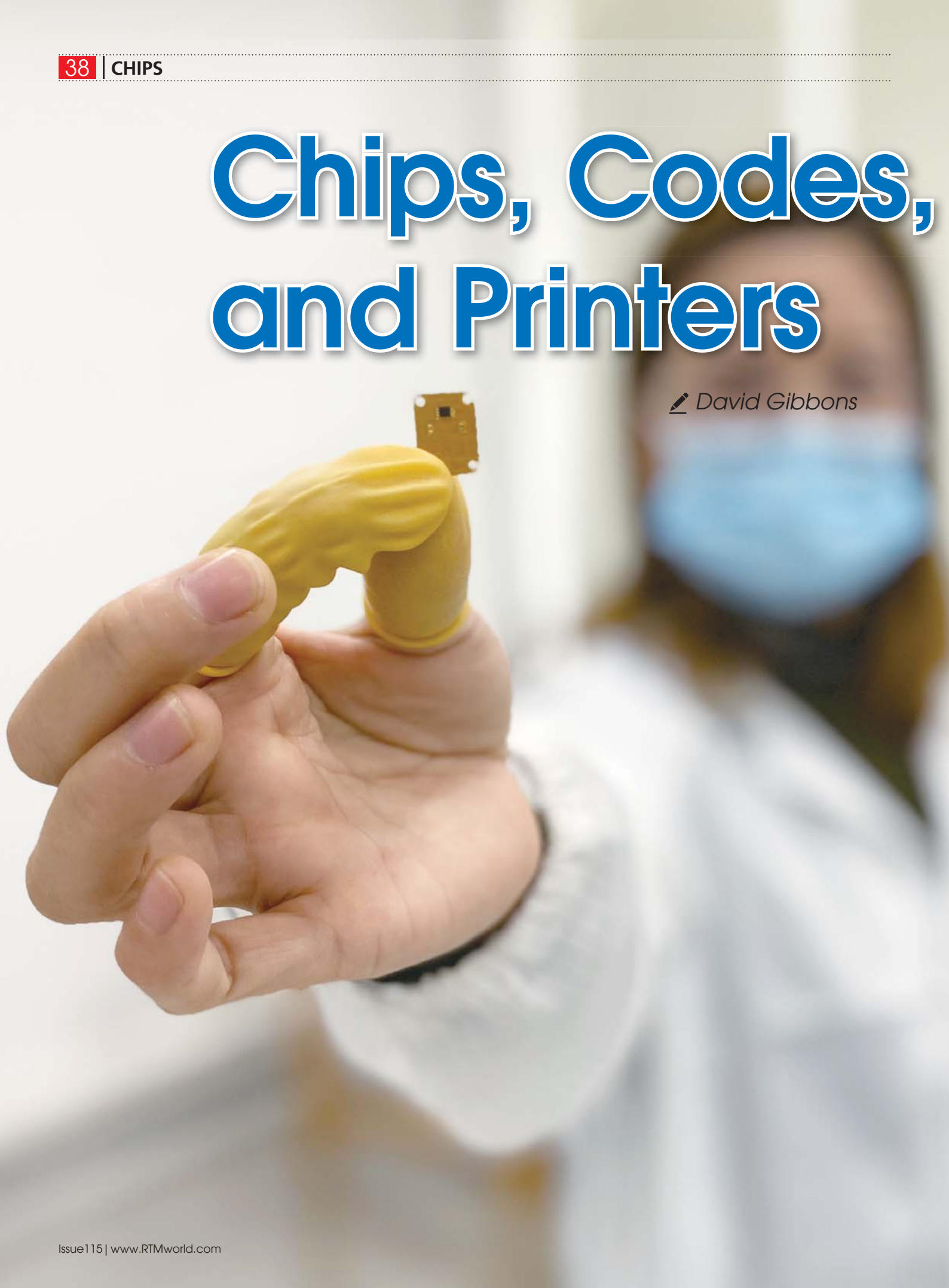
What aspects of your supply chain will you focus upon going into the future?

This is a long term investment strategy for our company. In order to maintain our leading edge in the market, we must continue to invest in our suppliers. Even now, we have new product projects in progress and this will never change. ■

Vincent Chen, President of HYB, <vincent@haoyinbao.com>

Chips, Codes, and Printers

David Gibbons



Cartridges

"It was the simple code, a key to communication between cartridges and printers."

Before I knew about serial numbers, I never could have imagined a simple code could dominate the future development of the aftermarket.

Ever since the arrival of the desktop printing aftermarket, there have been complaints about replacement cartridges used or, in most cases, unable to be used, in printers. Consumers blamed the distributors, who blamed the remanufacturers, who blamed the component suppliers for the poor product quality.

Evolution of the Cartridge Serial Number

The introduction of smart chips in the cartridges developed by the printer OEMs in the late 1990s became another hurdle for the aftermarket seeking to achieve a sustainable market share. They were often referred to as "killer chips" because they prevented the use of aftermarket cartridges that contained no chip or relied upon reusing the existing chip.

As a printer cartridge remanufacturer in Sydney Australia in the 1990s, and as the executive offices of the Australasian Cartridge Remanufacturers' Association, I remember well the threat chips were to aftermarket businesses. Remanufacturers argued the killer chips were a threat to "choice" for consumers, who would be forced to use OEM cartridges only. But from an OEM perspective, the arguments fell on deaf ears.

The OEMs argued at the time, and continue to claim, chips were to provide consumers with a better "customer experience." Each printer cartridge is allocated a unique cartridge serial number, as is the case with any electronic product. The uniqueness of the serial number is used as an anti-counterfeiting measure, for example. The serial number in a cartridge also works in tandem with the printer to identify and communicate its manufacture date, place of origin, and other necessary information including the remaining level of toner. Cartridges can be traced and managed according to such unique identification.

Necessity is the mother of invention and the aftermarket moved quickly to find a solution with replacement chips that would work on remanufactured cartridges.

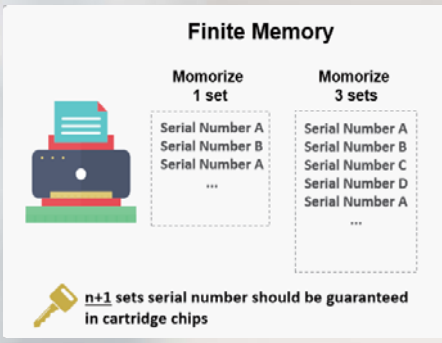
Most of the time, the investment into the development of replacement chips worked. Sometimes they did not work. The OEMs became more diligent and the science improved making it possible for more sophisticated chips to be developed.

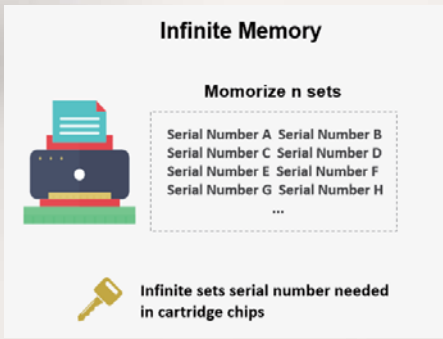
In a chicken and egg scenario, remanufacturers blamed the component and chip suppliers, and the suppliers blamed the remanufacturers for the dilemma over the reliability and unreliability of available chips.

Chip manufacturers were forced to analyze the cause for the increasing high rate of cartridge failures and found that some printers had the capacity to remember chip serial numbers. As a cartridge was installed into the printer, the serial number data in the chip was memorized by the printer. This meant that both OEM and aftermarket chips could not be reused. A printer would recognize the serial number of the cartridge as being the same serial number as having been used before. It would report an error and fail to work.

Chip manufacturers found, at first, printers could remember a certain number of serial numbers of recently installed cartridges. With advances in chip technology, cartridge serial numbers developed from simple numbers to a specially encrypted code. This meant printers no longer needed to remember a certain number of serial numbers, but were capable of remembering all serial numbers, permanently.

OEMs then developed a strategy where printers could have additional information passed on to each of their memories. This is through printer firmware updates and upgrades.





Certified Quality

Benefits of Certification

Seal of Approval for Cartridges

STMC certification proves that the company certified uses the highest industry-approved standards in manufacturing its cartridges. The STMC logo means that the cartridge in the box has been remanufactured by a company that cares about quality.

STMC stands for the Standardized Test Methods Committee. This global committee formed to find and promote standardized test methods for the printer cartridge industry.

For twenty years, the International Imaging Technology Council has evaluated and monitored the STMC program, fighting for those who use it proudly and against those who misuse it.

Customers demand STMC. Join the hundreds of STMC-certified companies that these customers want to buy from. Get certified today. Contact katie@i-itc.org for more information.

David Gibbons, author of this article, ran his own remanufacturing business in the 1990s in Sydney, Australia. Gibbons claims the use of the chips by the OEMs posed a big threat for the aftermarket at the time.

As has become well known, firmware updates can optimize performance, fix bugs and also change data instructions, raising the communication threshold between the cartridge chip and the printer. Once a printer is updated, it is enabled to block specific serial numbers, causing the replacement cartridges with a "blocked" serial number to be rejected by the printer.

The Cost and Risk of Chip Decoding

Chip design must conform to the printer's memory mechanism so that serial numbers are recognized and accepted. Obtaining a plentiful supply of serial numbers is the key.

So, how does one get a plentiful supply of serial numbers? Remember, a cartridge serial number nowadays is no longer just an identification number, but has to have the ability to be to a specially encrypted code when needed.

Developers of chips today have the ability to generate infinite serial numbers if the encryption algorithm has been decoded. However, it is incredibly difficult to decode and redevelop an encryption algorithm. In general, chip manufacturers advise decoding times are measured in a number of years. The work required demands a huge investment in time and resources. It is arduous work and there are no guarantees it will provide a return on the investment.

Think of the amount of work and the financial risks that are being taken to develop a vaccine for COVID-19. Decoding a chip and developing a solution is a similar process, albeit on a different scale. But, the risk of failure is great, especially if the decoding and development time runs into a number of years. The possibility of reward is also great if decoding occurs quickly.

A cartridge serial number nowadays is no longer just an identification number but has to have the ability to be to a specially encrypted code when needed.

However, is there another solution if chip manufacturers do not invest in the decoding of the encryption algorithm?

Yes, chip manufacturers can develop a massive number of serial numbers which will reduce the risk of installing replacement cartridges using the same chip serial numbers. This means, however, in order to generate sufficient serial numbers based on OEM cartridges, a chip manufacturer must be financially strong enough to purchase a plentiful supply of OEM cartridges and establish and maintain a professional lab containing data collection equipment for serial number decoding and development.

Even when a chip is developed, the risk is very high that if not enough serial numbers have been generated, some customers will find cartridges will still be rejected by their printers. Therefore, the chip manufacturer needs to constantly invest in order to maintain an ongoing, steady chip performance. This requires an enterprise to have sufficient resources invested to provide stable solutions for the market.

"The code is like a butterfly in the Amazon rainforest which, with each flap of a wing, causes a ripple of effects to influence chip manufacturers, cartridge manufacturers, end-users, and the entire aftermarket."

Challenges and opportunities will continue to coexist into the future. The power of wisdom, backed up by an entrepreneurial spirit and investment, will deliver more "keys" and "fresh blood" to the sustainable development of the aftermarket. ■

IN MY VIEW

How important is vertical integration and automation in your choice of supplier?

Japan

Iemori Kanetoyo
Sunwise Information Corporation

Being vertically integrated and/or having automated production lines is always included in our choice of supplier as it helps us feel at ease when it comes to ensuring stability and quality. To some extent, the supplier should be in control of the subsidiary factory for toner or ink production as well as cartridge assembly. Suppliers who develop automated production systems are able to solve problems related to human error and the shortage of labor.

Argentina

Alejandro Campos
Servicint

In my view, vertical integration in a supplier—especially backwards— is very important as it ensures quality consistency in components and/or raw materials. Knowing that the supplier has more control and responsibility in controlling quality, reduces the time for the solution or any necessary modification in the event of possible failures. In general, experiences with providers that have vertical integration have been more beneficial than with those that do not.

United Kingdom

Darren Turner
My Total Office Solutions

When choosing a supplier of finished goods, it's important to understand that the products are IP-free, have been quality checked and, if at all possible, to know the manufacturer. We're not a huge company and we don't have the numbers to buy direct from manufacturers on all our required product lines. On these occasions we use distributors based in the UK, but still insist on a quality, IP-free checked product.

Opportunities in the New Normal

Louella Fernandes

This is an extract of a presentation given remotely by Quocirca's Louella Fernandes to the RemaxWorld Summit audience in Zhuhai, China in November 2020. For those wishing to watch the full presentation, it can be viewed at https://bitly/3qI52Tx

I'm very pleased to share with you some industry insights from Quocirca which reveal what we believe are the trends for the coming year 2021, the impact of COVID-19 and the opportunities that exist in the office printing industry.

The Hybrid Workplace Post Covid-19

In the hybrid workplace there will be opportunities to offer integrated home and office print service solutions:

1. Touchless technology: services that can authenticate the user on an MFP without the need to actually touch the device. Obviously, there will be a lot more touchless technology emerge in the office workplace because of the need to minimize contact with devices. Pull printing is ideal for that.

2. Cloud collaboration: the need for the hybrid remote workplaces to be supported by the cloud is essential. This is a real opportunity for manufacturers, MPS providers and independent software vendors (ISVs) to develop robust cloud print management tools that integrate with the best of breed out there—Microsoft, Google Cloud and so on. That's a huge opportunity and it does come with a different revenue model than the standard, traditional print infrastructure. The print industry really needs to jump aboard sooner rather than later, because if you don't have a proposition around cloud, most IT decision makers will not even entertain what you have to offer.

3. Zero trust security: Because of the expanded threat landscape, with more end points being connected in remote workplaces, there's an increasing need to protect an organization, wherever their employees are based, from cyber-attacks and zero trust securities. It's very much about protecting the identity of a device regardless of its location or regardless of the actual device. For more, go to Quocirca.com.

4. Artificial intelligence: There are opportunities beyond print around business process, automation analytics, and even workspace monitoring.

Louella Fernandes is director of Quocirca. She is globally recognized as a leading authority on market trends in the print, imaging and managed services industry. With 25 years' experience in the sector, she delivers an unparalleled insight into the evolution of print in the digital age and is a highly respected expert on digital disruption in the print industry. *<Louella.Fernandes@quocirca.com>*

Artificial intelligence and machine learning are absolutely the future for the IT industry and how one actually uses this technology, whether it's for security threat monitoring, analyzing what's being printed, understanding how one's customers are using devices, or to develop new products and services solutions. AI is absolutely the future for innovative businesses.

Some Recommendations

The industry should capitalize on the acceleration of cloud services in digital transformation. Look at:

- expanding services beyond the printed page;
- how to develop services for cloud collaboration, and develop digital workflow to integrate these distributed workforces across the hybrid office and home environment;
- developing an integrated home and office print security proposition. Some vendors, and pre-manufacturers have a very broad and scalable product portfolio, which covers the range from home to small office, home office, right to production. And perhaps those manufacturers will be in the best position to succeed because they have a portfolio which suits the needs of every type of worker. It's very much about capitalizing on that opportunity for channel partners to expand their portfolio of devices so they can address these requirements;
- repositioning IT services, expertise, and trusted partner status. IT services providers are becoming more influential, having capabilities around software expertise, cloud, and security either developed in house or partnering with partners that already have these capabilities rather than reinventing the wheel.

There are a lot of ISV, and channel partners, outside of the traditional print industry which can actually add value. It's really up to the more innovative, leading MPS providers and channel

IN MY VIEW

How important is vertical integration and automation in your choice of supplier?

Germany

Volker Kappius
Delacamp

As the exclusive distributor of Mitsubishi Chemicals (MCC) for EMEA, I regard both as important pillars for high and repeatable quality. You may be interested to learn MCC is by far the most vertically integrated and automated manufacturer of chemical toner and OPCs. But these are not the only important factors that contribute to repeatable quality. Being on the learning curve for a long time is even more important. This is the biggest asset of MCC and Kuroki. No other companies have been producing high quality OPCs and chemical toner longer than MCC and high-quality blades longer than Kuroki.

Australia

Shane Foreman
Cartridge World

The most important factor has always been the quality of the product. For more than 25 years, my focus has been the quality of the aftermarket product. Only in the last few years, has vertical integration and production automation entered the aftermarket industry. Personally, I feel these are vital steps for the manufacturers wanting to ensure product quality, reliability, and consistency, which ultimately is what the industry needs if it is to continue moving forward.

United Kingdom

Dennis Haines
Badger Office Supplies

Let me tell you quite succinctly what is important to me as a customer. In order of importance:

1. Quality
2. Intellectual property compliance
3. Consistency
4. Cost Effectiveness

Suppliers must stay profitable through automation and vertical integration.

IN MY VIEW

How important is vertical integration and automation in your choice of supplier?

Romania

Victor Matache
Toko

After more than 25 years of experience in compatible consumables, we have learned that when quality and reliability are important, our purchasing decison comes down to the following factors:

- quality of materials: cases, rollers, blades, OPC drums, chips, toner;
- quality control on the production lines.

I always look for suppliers who control the production of quality materials in their group of factories. I believe the production of OPC drums and toners, for example, requires highly developed technologies from dedicated R&D teams. Common sense tells us that stable quality can be better achieved on a fully automated manufacturing line, which has the added benefit of lower production costs as well.

Hong Kong

Edwin Lui
Cartridge World

As a franchise organization, this is something that is very important to us. With vertical integration, a supplier is able to control the quality of the products from raw materials through to the finished product. This is something we recognized several years ago when we established the Cartridge World Global Procurement Centre in Zhuhai. By doing this, we are able to ensure the quality of the finished products right through the supply chain and to the point where the product is labelled and packaged in a Cartridge World branded box, which enhances the overall product experience for our master franchisees, franchisees and our customers.

partners to really exploit the opportunity to build IT services expertise.

Ultimately, it's all about helping customers be resilient through to the next crisis and further—if this does ever happen again in some shape or form. It's about ensuring customers have the print infrastructure in place and the scalability and the adaptability so that they are able to support their workers to remain productive with the right tools, whether their digital tools or print related tools, to ensure that they remain productive in a similar situation in the future.

It's really up to the more innovative, leading MPS providers and channel partners to really exploit that opportunity to build the IT services expertise.

The print industry is at a major inflection point. Even prior to COVID, print volumes were flat to declining. Digital disruption was already impacting the industry. Business, as usual, is still very much elusive and unknown.

Industry players have to reposition and rethink their strategy. Clearly, some manufacturers are already doing this better than others. Ultimately, it really does require a "start-up" mentality.

The industry is very much dominated by a few large legacy companies. They are typically the "oil tankers." In this metaphor, the "speedboats" are the more innovative companies like the ISVs, maybe the IT service providers who are able to react maybe much faster to market changes and they also have the ability to develop software capabilities that are much more innovative, perhaps than the print manufacturers. This metaphor is absolutely relevant to the print industry. These big legacy OEMs really need to develop a "start-up" culture within their business so that they can drive innovation not only on the product technology but also on their services and business models.

I'd like to thank you for your attention. If you do want any information on Quocirca reports, please do look at Quocirca.com or Print2025.com where we've got a range of information, infographics and videos. Or please contact me directly. ■

Mark Dawson

Heading Upstream or Downstream —Make Sure You Have a Paddle

The need to defend margins and get closer to the end customer makes vertical integration most attractive.

Vertical integration occurs when a company acquires, or builds a presence, in a different level of the supply chain. It can be in two directions: downstream or upstream.

Imagine a cartridge (re)manufacturing business, which purchases components: OPCs, toner, smart chips, seals, wiper blades, etc. It builds cartridges and sells them to distributors. The distributors sell to resellers and the resellers sell to the end-users or consumers.

If the (re)manufacturer developed the capability to make smart chips, or if it acquired a company already making them, this would be an example of upstream (or backward) vertical integration. If the business built a distribution operation or acquired one, this would be an example of downstream (or forward) vertical integration.

Vertical integration can deliver massive benefits. However, the caveat, like with all business strategies, is good execution. Control and improved margin are two of the biggest prizes. Owning all or part of the supply chain increases power and competitive advantage.

A cartridge (re)manufacturer with the ability to make its own smart chips can better address the most critical technology facing the industry today. This would not eliminate the challenge of overcoming OEM firmware updates. But it would deliver competitive advantage through technical understanding and speed to market. It would also deliver the ability to "manage" the competition if other players are reliant on that raw material. To control market availability and prices are the ultimate power.

Margin optimization is another big driver for vertical integration. When the smart chip manufacturer sells to the cartridge (re)manufacturer, there is a margin. If the cartridge (re)manufacturer owns the chip production, that margin is captured internally, increasing the overall end-to-end profitability of the business.

Vertical integration has been a feature ever since I joined our industry in 1987. My first employer, Nu-kote, manufactured finished cartridges and acquired ICMI, a leading independent toner manufacturer, in 1992.

This is upstream vertical integration. Not long after that, Turbon, a leading manufacturer of toner, acquired Kores Nordic, a major cartridge remanufacturer. This is downstream vertical integration.

The acquisition of Katun by GPI in 2018 is a more recent example. Another would be the acquisition of Cartridge World by SGT in 2015. Hubei Dinglong and Print-Rite are other examples of strong vertically integrated players in our space. The Ninestar-Seine-Pantum-Apex-Static-Lexmark constellation would make an interesting case study on integration for any business leader.

OEMs have long been integrating vertically by acquiring their channel partners. Some examples include Kyocera's acquisition of Annodata in 2016, HP's acquisition of Apogee in 2018, and Xerox's acquisitions of Altodigital, ITEC and Arena in (pre-COVID) 2020. Recently, there has been a clear move from defensive to offensive tactics. Instead of acquiring their own reseller partners, Xerox targeted the channel partners of its OEM competitors.

Horizontal integration occurs when a company acquires a company at the same level of the supply chain. The Clover acquisitions of TRS (2011), Demetec and K&U (2012) are examples of horizontal integration.

Diversification is another strategy. This is when a company acquires or sets up business in a different market. Clover did this with its acquisition of Valutech in 2012, thereby entering the mobile phone refurbishment sector.

Expect much more activity. Pre-COVID, consolidation was long overdue. The pandemic has exacerbated the situation. There are too many players chasing the same customers. Integration will accelerate as part of the consolidation process. The need to defend margins and get closer to the end customer makes vertical integration most attractive. The landscape will be different 24 months from now. Get ready. Get your paddle! ■

Mark Dawson

RT Global Partner for EMEA

Mark Dawson is RT Imaging World's Regional Partner for Europe and the Middle East. He joined the imaging supplies industry in 1987 and has held senior positions with both American and European corporations, including MSE and Clover. He is currently building RTC/IOP (Real Time Communication BV) whose mission is to help independent resellers find new revenue streams and optimize margins.
Dawson has partnered with RT to provide consultancy for manufacturers with plans to increase share in Europe and the Middle East. For more information, please contact him at <mark@ iopbv.com>

Too Vert

Founding Print-Rite Group Chairman, Arnald Ho

Late ... to ically Integrate?

Steve Weedon

Most business managers choose to focus on core strengths and outsource to others what they cannot do something themselves. In our industry, for example, most remanufacturers focused on the "art" of remanufacturing ink and toner cartridges, relying on the skills of other companies for the making of component parts, inks, toners, plastics, chips and OPC drums. There's nothing wrong with that, but it does mean being dependent upon others in order to make your remanufacturing business model work.

At the start of the 1990s, when cartridge remanufacturing kicked off, there was a frenzy of activity among companies to position themselves for success within a new and potentially highly-rewarding industry.

Remanufacturers started small and focused on mastering the HP SX cartridge—not HP's first cartridge, but its second. The first was the CX and was not hugely successful. But the SX, made by Canon, was a runaway success. Eighty percent of all installed printers at one time used the SX engine, creating a high volume of empty cartridges that fueled the global growth of cartridge remanufacturing.

Toner companies like Coates, ICMI and Imex started to develop monochrome toner, eventually overcoming all the technical problems related to humidity issues to make some great performing toners.

Fuji OPC devices made the first OPC drum available for the SX and partnered with Copylite in the USA for distribution. These first SX drums were selling for about $28.00, each with costs less than $3.00. It opened a floodgate with many other companies wanting to invest and join in the making of OPCs. Manufacturers of mag rollers, developer rollers and cleaning blades soon appeared. Silicon oil wands for the fuser assembly were made by Static Control. With green flocking just like the OEM's, the flocking technology was a nightmare to master. However, as with all these technologies, it was one step at a time, with companies hoping the investment would pay off with high product volumes and long-term demand.

Chips did not appear until 2000. At first, many thought customers would accept cartridges

Steve Weedon is an award winning CEO who has held senior management positions at various OEMs as well as Katun Corp, Static Control Components and Cartridge World. He was the original founder of The Recycler Magazine and of trade shows in Europe. He is currently CEO at Print Rite Europe Ltd, Print Rite Pelikan Germany and Print Rite Pelikan France. Contact Weeon at <stevew@printrite-eu.com>

IN MY VIEW

How important is vertical integration and automation in your choice of supplier?

Australia

James Douglas
Advanced Consumables Technologies

Done properly, a well-managed vertical integration is a winning strategy. However, to achieve this is very difficult and I don't believe anyone has successfully done this in our local industry—not yet. We have seen a number of attempts to do it in our market, none of which have been successful, and it ended up in a mess. There has always been a conflict of interest, or someone in the chain has let us down, or someone was left dissatisfied.

Every chain that has been attempted in Australia started with a lot of promise but failed because of greed, incompetence, or a lack of understanding of the customers.

International factories and suppliers have a hard time understanding the local market and also have communication issues so they rely on local support to get market penetration. In turn, we do not want to deal with suppliers that want to sell direct to the market: a market they simply do not understand.

United States

Ken Lalley
Static Control

Static Control is accustomed to vertical integration and manufacturing automation; they are essential for providing premium quality products. It's why we led the way and were first in the industry to have vertically integrated operations. It is a tradition we continue to this day. We knew it was the best way to ensure consistent quality for every component, chip and cartridge delivered to our customers. Our suppliers are held to the same high standards of quality, and each is thoroughly vetted to ensure they have vertically integrated operations and automation where possible. By being involved with every step of the process, Static Control can provide the best imaging supplies to its valued customers around the world. It is this approach to both components and cartridges that makes Static Control a market leader with a proud and enviable heritage.

Print-Rite's larger than life founding CEO Arnald Ho, has been profiled in Times Square, New York, been recognized with enterprise awards and as a loyal and outspoken champion of imaging industry associations.

without a chip. That did not last long and thankfully many firms started to invest in chip design and manufacturing. Simple designs and simple chip technology did not last long as the OEMs continued to make their chip designs evermore complex with encryption. Chip design and chip making became key in an industry that relied on the chip being available to remanufacture the cartridge and make a sale to an end-user.

There were many companies in the supply chain that focused their special talents to produce the components, the inks and toners needed to support a fledgling industry. Remanufacturers relied upon the continuous development of new products from these companies in order to keep up with the new cartridge demand and opportunities.

Vertical integration has many pros and cons, and requires a leader with great foresight and vision, determination and confidence to pull it off.

It was pointless having the toner and the OPC to remanufacture a new cartridge if there was no chip available to launch the product.

The larger remanufacturers realized they needed to help co-develop good cartridge systems and formed good alliances with toner companies, OPC companies and component makers.

But the chip was the major hurdle, with few developers willing to invest in an uncertain journey of time and money, unsure if they could ever bring a chip to market. Remember the T650 Lexmark chip? It took more than three years to develop and cost close to $4 million to bring to the market. It finally launched at $45 a chip.

Print-Rite Was the First

At least one company took a different route. The Print-Rite Group (the Group), established in 1987, and based in Hong Kong. Formerly known as A&J Trading, it was founded in 1981. The Group, under the leadership of Arnald Ho, wanted to be less reliant on others to establish a successful business. Over the last 40 years, the Group has had a vertically-integrated business model and has acquired many companies to expand its technology and manufacturing base. Today, the Group is the most vertically-integrated in the industry.

Instead of operating solely as a manufacturer, distributor or retailer, a vertically-integrated company can perform the roles commonly carried out by a number of product specific suppliers, usually decreasing product manufacturing costs, bringing the technologies together, expanding knowledge and intellectual property and in the process relying less on outside contractors

for continued success, and greater control.

Vertical integration has many pros and cons and requires a leader with great foresight and vision, determination and confidence. Print-Rite bucked the trend over the last 40 years and today, enjoys an unrival reputation globally as a tier-one manufacturing company, making its own inks, toners, OPCs and plastics. The ICMI toner plant was purchased in 2000 and the Group acquired the AEG OPC plant in 2010, now called APS. Chip development started in 2000. The Group became less dependent and more self-sufficient as it built its global business over the last 40 years.

Innovation is Core

A vertically-integrated company can acquire various technologies, but without innovation to pool the resources and technologies together, it is hard to capitalize upon the investments made.

Innovation is the key to drive patents and new products that open up new markets, new sales opportunities and creates advantages over the competition. The group today owns around 3,000 patents and is seen as a leading industry innovator providing almost everything related to 2D products.

Recently its European subsidiary PRPS GmbH launched its Pelikan-branded bio-based range of toner cartridges that significantly reduces the CO2 footprint and utilizes a bio-based toner of 48 percent organic materials and a bio-based plastic that uses 57 percent organic materials. The result: the most eco-friendly range of toner cartridges available. A great example of technology integration and innovation at work in the Group.

As our industry changes direction and OEMs shift business models to adapt to changes, the need to be agile and sure-footed to adopt efficient operational structures enhances the competitive profile of the business. Vertical integration and outsourcing are viable approaches that can go hand in hand. Outsourcing frees up capital and can buy time when doing everything yourself sounds good but sucks up cash flow and takes time to get it right.

It is too late to vertically integrate now in this industry but maybe we will see some backward vertical integration as resellers start to acquire their suppliers or start manufacturing on their own.

The Group made and sold their first IP-safe compatible product in 1984, a ribbon that went on to be highly successful to the business. Patent-safe compatible products require the integration of different technologies, talents and patent know-how. This includes the ability to understand all the relevant valid patents, reverse engineer and be able to develop design-arounds that ensure the final product performs equally as well as the original—without infringing the OEM patents. That's much easier said than done.

That is why the Group led the way in IP-safe compatibles. It should be noted these IP-safe compatibles have been legitimized further, in recent times, with some major OEMs preferring to sell them over remanufactured cartridges in order to drive higher profit margins on contracted printers.

For 40 years, Print-Rite has successfully used a model of vertical integration to gain control, be less reliant and dependent on vendors, to expand its technology understandings and to build a powerful patent portfolio that sets it apart from its competitors. As resellers take a page out of the OEM book and switch to IP-safe compatibles for bigger margins, the Group is in the right place at the right time with the right IP-safe compatible products.

It is too late to vertically integrate now in this industry but maybe we will see some backward vertical integration as resellers start to acquire their suppliers or start manufacturing on their own.

It's never easy at the top making these type of business decisions, but as the well-known saying rings in our ears: "it ain't over till the fat lady sings." ■

Supply Chains and Market —what are they and how do they work?

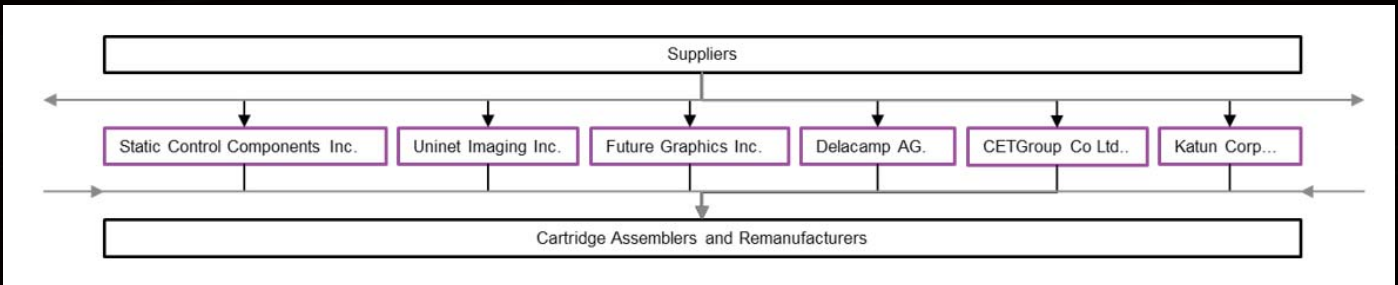
What actually is the supply chain and what is the rationale for integration in the market?

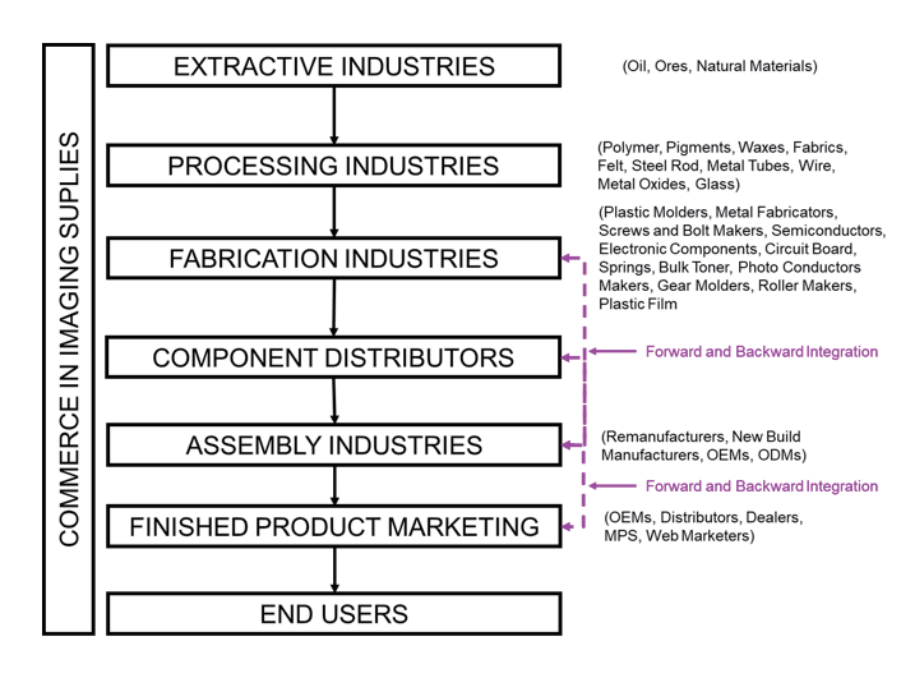
In recent times the business environment has been seriously affected by the global pandemic, trade war and tariff turmoil between the US and China which has had global ramifications. Consequently, there has been much talk about disruptions to the supply chain in the global industry. In the case with imaging supplies, intense competition for market share has adversely impacted industry economics. The effect on the supply chain has led to strong trending towards integration in the market.

In commerce, the supply chain is a system of organizations, people, activities, information, and resources involved in supplying a product or service to a consumer. It can be internal or external to a company dependent upon policies and resources available in an industry. In the commerce of any product or service, a supply chain will always be part of the business structure.

Integration is the strategy adopted by a company to enhance business operations to improve efficiency, profitability, security of supply and market share. In marketing there are different types of integration – vertical and horizontal integration. These are strategies used by businesses in the same industry or production process.

In a horizontal integration, a company takes over another that operates at the same level of the value chain in an industry.





A vertical integration, on the other hand, involves the acquisition of business operations within the same production vertical. Companies can integrate vertically in two ways: backward or forward. Backward integration occurs when a company decides to buy another company that makes an input product for the acquiring company's product. Forward integration occurs when a company decides to take control of the post-production process and acquires downstream sales. The vertical market in the commerce of imaging supplies is as shown in the following chart showing typical integrations.

Supply Chain

Successive operators in any industry, from the beginning to the end, add materials and

Integration

Graham Galliford

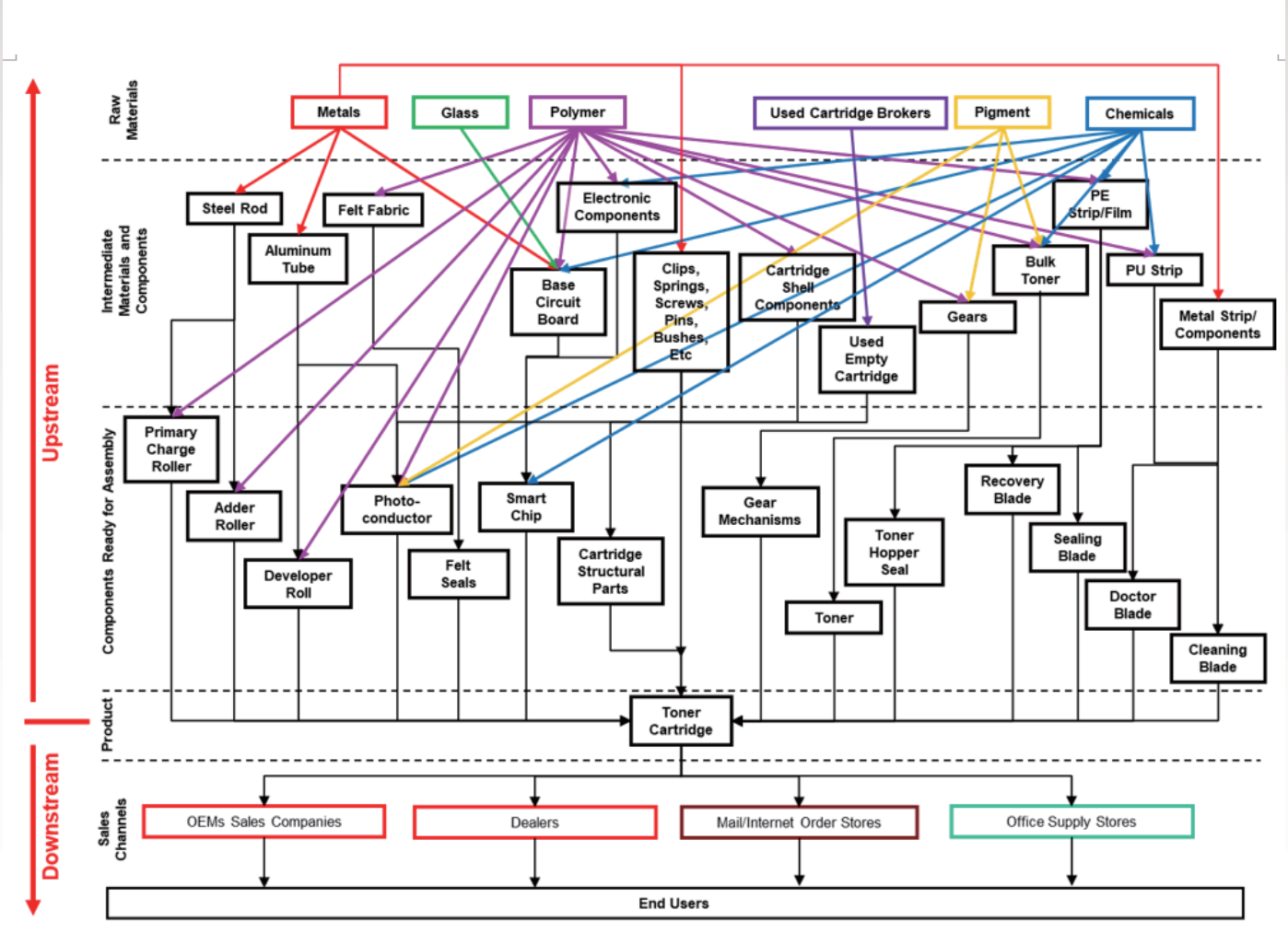
Graham J. Galliford is a world-renowned consultant, researcher, writer and speaker for the global imaging industry. His work has encompassed technologies in a variety of printing components and products but has worked primarily in the field of toner-based printing technology since 1974. He can be contacted at <graham@gallifordconsulting.com>

work to the finished item and consequently add cost and value to it. The descriptor "chain" is not completely accurate in most cases. The word "chain" implies that there is a single strand of elements in a supply chain. In the vast majority of cases, supply chains are actually "networks" which have a complex web of supply relationships from raw materials to finished product and beyond.

Supply chain/networks comprise both vertical and horizontal components. The supply chain for the imaging supplies market has both characteristics. The chart below shows the supply chain/network in the commerce of the physical product of toner cartridges. The chart is an example and does not necessarily represent every possible variation that exists in the market today.

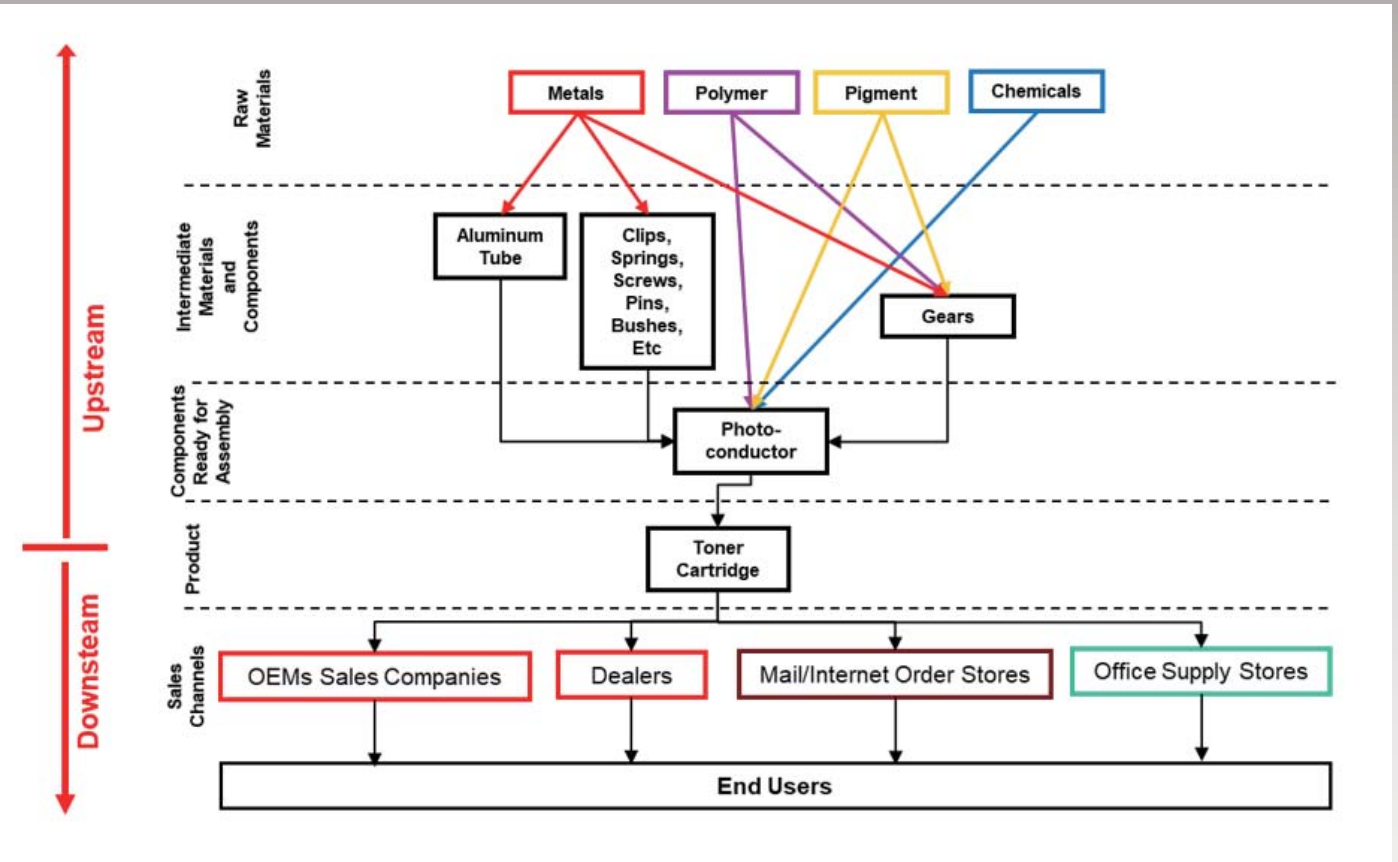
the upstream portion of the chain from the product is "product centric" and the downstream portion is marketing centric.

Most supply chain/networks are actually the combination of multiple supply chains for sub-assemblies and components that support the final product. As can be seen from the diagram, the upstream portion of the chain from the product is "product centric" and the downstream portion is marketing centric. The upstream portion of the supply chain from the toner cartridge product perspective, comprises multiple vertical markets.



The downstream portion is largely a horizontal market above the end-user though there can be multiple companies in channels taking the final product to market to the end user.

Included in this example of the toner market supply chain, is the supply chain for the photoconductor (OPC). The OPC supply chain is an example of a vertical market, a component encompassing a group of companies and customers that are all interconnected around the specific niche of production and supply of photoconductors. As shown below, the elements of the upstream portion of the supply chain includes aluminum tube, polymer, pigment, specialist chemicals, gears, and weight manufacturers and suppliers.



The companies in a vertical market are typically attuned to that product/market's specialized needs and generally do not serve a broader market. In the case of the OPCs, many of these items are specialized specifically for OPCs. The tubing is precise in dimensions, grade, and surface quality. The specialist chemicals are of high purity and special chemical composition as are the polymers and pigments. The gears and weights are design specific to their application. This material and component specialization increases the criticality of the security of the supply relationships as well as potentially adversely affects cost. This makes any potential disruption of that vertical market supply chain critical and crucial to economic operation of the market participants. In such a supply chain, vertical market integration by a participant is the strategy often used to improve their security of supply and to improve profitability.

Market Integration

As previously mentioned, the majority of commercial markets have vertical and horizontal market characteristics. Market integration is a strategy employed by companies to improve many facets of business operation. These facets include profitability, security of supply, market share and quality guarantee. Market integration can be capital intensive, often requiring large sums of money to purchase part of the supply chain or develop new capabilities outside a company's original product field.

This material and component specialization increases the criticality of the security of the supply relationships as well as potentially adversely affects cost.

Vertical Integration

Vertical integration is the combination in one company of two or more stages of production or supply normally operated by separate companies. There are three types of vertical integration, forward, backward, and balanced vertical integration. Forward integration is an instance where a company acquires, develops capability or merges with the next stage in the supply chain. Backward integration is where the company acquires, develops capability or merges with the production stage in the supply chain. Balanced integration is quite simply a combination of both backward and forwards integration.

Forward Market Integration

With forward market integration, downstream vertical integration, the company owns and controls business activities that are ahead in the value chain of its industry. This might include, among other things, direct distribution or supply of the company's products, creating a captive portion of its market. This type of vertical integration is conducted by a company advancing along the supply chain. An example of this is Color Imaging in the USA. Color Image (now

named Color Imaging) was founded as a manufacturer of toner. Competition in the supply of toner, particularly of monochrome toner, has intensified over the course of many years. Profitability in the business of toner production and sale has declined. In order to improve business profitability, Color Imaging has forward integrated by developing their own toner cartridge production and marketing directly downstream bypassing traditional purchasers of bulk toner. This forward market integration was by investment in the development of internal competency in toner cartridge production. The relationship between Color Imaging and General Plastics Industrial (GPI), a longtime producer of cartridge components should be noted. Indeed, GPI has itself forward integrated with the development of its subsidiary Cartridge Web that is also in toner cartridge production and marketing.

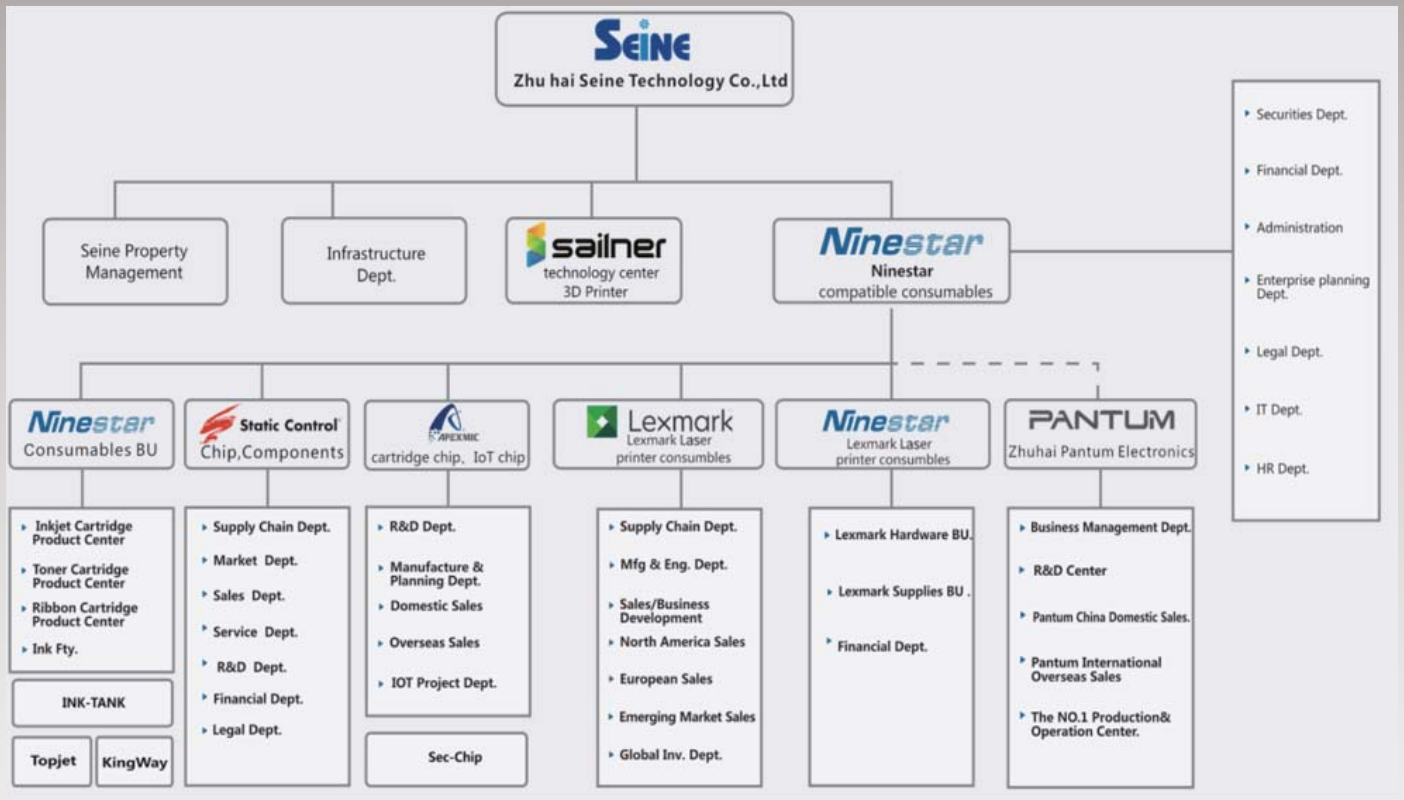
Another example of forward market integration is the activity of Hubei Dinglong Co., Ltd. Since its establishment as a producer of dyes and related chemicals, this company has integrated into the downstream products including chemical prepared toner, ink jet colorants, chips, charge control agents, carrier for dual component toners, primary charge rollers, developer rollers, and color toner and ink jet cartridges. These forward integrations have been as a result of internal capability development as well as by acquisition of companies and the group now includes Speed Infotech (Beihai) Co. Ltd., Hubei Dinglong Chemical Co.,Ltd, Hangzhou Chipjet Technology Co.,Ltd, Shenzhen Retech Technology Co.,Ltd, Hubei Dinghui Electronics Material Co.,Ltd, Hubei Dinglong Love Visual Media Technology Co.,Ltd, Hubei Sanbao New Material Co.,Ltd, Nantong Longxiang Chemical Co.,Ltd, Zhuhai Mito Color Imaging Co.,Ltd, Zhuhai Kolion Tech Co.,Ltd, Zhuhai Dinglong new Materials Co.,Ltd, Shandong Kaiyuan Century Co.,Ltd. (Hubei Dinglong has also integrated horizontally by acquisition of CPT manufacturer Ningbo Flexitone New Materials Co.,Ltd.)

Backward Market Integration

Backward integration is when a company expands its role to fulfill tasks formerly performed by businesses upstream in the supply chain. Backward integration often involves acquisition of or merger with another company that supplies its products. It can also be by the development of capability production in the next upstream stage in the supply chain. Companies pursue backward integration when it is expected to result in improved efficiency and cost savings. For example, backward integration might cut transportation costs, improve profit margins, and make the firm more competitive. Businesses can also gain more control over their value chain, increasing efficiency, and gaining direct access to the materials that they need. In addition, they can keep competitors at bay by gaining access to certain markets and resources, including technology or patents. In the imaging supplies industry, an example of backward integration is that of the Print-Rite group. Print-Rite has long been a manufacturer of toner cartridges. Over the many years of its operations, the company has developed capability and acquired manufacturing companies that supply upstream products needed for cartridge production. Product examples backward integration by acquisition include toner and OPCs with the acquisition of ICMI (China) Ltd and AEG Photoconductor (Shanghai) Co. Ltd. respectively. Product examples of Print-Rite's backward integration development of capability rather than company acquisition include ink jet ink and chips.

Balanced Vertical Integration

As previously mentioned, balanced integration is a combination of both backward and forwards integration. Ninestar



is an example of balanced market integration. Ninestar now includes within its domain not only print cartridges but also chips, toner, blades, rollers, and other cartridge components. Further the scope of the business includes printer design and manufacture by the development of Pantum and acquisition of Lexmark. While Zhuhai Seine is the holding company for the group, the following chart was extracted from the Ninestar Group website showing the scope of the group's portfolio and spread both forward and backwards in the industry.

Horizontal integration

Horizontal integration is the acquisition or merging of companies operating at the same level of the supply chain in the same business. This is in contrast to vertical integration, where firms expand upstream or downstream in the stages of production. By horizontal integration, a company can increase the production of goods or services in the same part of the supply chain creating economies of scale and increased market power over distributors and suppliers. By merging two businesses, they may be able to produce more revenue than they would have been able to do independently. Other possible enhancements to a company can be increased size, product diversification or broader services offerings, reduced competition, and access to new customers or markets. In addition to this, a newly merged company can cut down on costs by sharing technology, marketing, research, and development, production, and distribution.

The Clover Imaging Group is a good example of horizontal integration by its acquisition over the years of multiple cartridge remanufacturing companies, including acquisitions of LMI Solutions. By the acquisition, strategies employed by Clover Imaging Group the organization has become the world's largest collector and remanufacturer of printer cartridges.

There doubtless will be some continued integration in our industry with companies redoubling efforts to improve business performance by reducing costs and improving supply chain control.

Supply Chain and Business Dynamics

There are five phases in a business or market life cycle—product development, market introduction, growth, maturity, and decline/stability. The supply chain evolves during this cycle and continues to function in the manufacture and supply of imaging products to the final users. Market integration occurs variably during specific periods in the evolution of the industry. Forward and backward, vertical as well as horizontal integration, occur in the growth and beginning of the decline phases. When the market is further in decline, there is typically emphasis on horizontal integration. The cycle ends with no integration at all at the end of the life cycle.

Arguably, when looking at the imaging supplies industry, we are now seeing the beginning of the declining phase with a growing reluctance to invest in upstream investment. As a consequence, we will see more horizontal integration as the industry copes with growing overcapacity. There doubtless will be some continued integration in our industry with companies redoubling efforts to improve business performance by reducing costs and improving supply chain control. ■

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Stuart Lacey

Now is the Time to Seize the Opportunity in Africa

This crazy global pandemic has simply brought forward an industry-wide consolidation much sooner that it might otherwise have occurred.

As each day goes by it is fascinating to see how our imaging industry is changing so dramatically and, depending on where you sit, the outlook is either very bleak or very promising.

For so many companies, there has been an unfortunate decline in business, with customers either reducing the number of pages printed or worst still, closing shop.

For the domestic markets (notably Europe and the U.S.), where choice and competition are well established, you can argue the decline has been far worse than in the 'developing' markets.

Since the aftermarket share is so high and opportunities for growth or even new customers are fought over by so many well-established companies (and brands), the price pressure is considerable. In fact, when you look at some of the ridiculous prices being offered, you have to ask yourself if the businesses are sustainable and obviously this price pressure is pushed all the way up the supply chain.

Suddenly, with such a decrease in demand manufacturers of components and finished products alike are rightfully concerned about the future of their businesses and what direction to take.

For many of the largest manufacturers of finished products, especially those only manufacturing for third parties under a private label, they are completely at the mercy of their customers. Often these customers only see the factory as a source and not as a partner.

As such, as the price pressure increases customers simply put pressure back on the factory to drop prices with the threat (veiled or otherwise) of moving their volumes elsewhere. Unfortunately, many factories have been dropping prices often without the customer even asking… !

This is simply madness and completely unsustainable. What ever happened to being proud of your offerings and selling the added value?

This crazy global pandemic has simply brought forward an industry-wide consolidation much sooner that it might otherwise have occurred.

But what of the so called "developing markets?" I always feel this title is often given by mature markets to those territories they are scared of, confused with, or too lazy to invest time and money to develop. The label provides an excuse as to why they have not been successful or even failed in these regions.

However, having lived and worked in a 'developing market' for a long time, I see there are tremendous opportunities in what I call "growing markets." While pricing is obviously important, customers are looking for LOCALLY available, QUALITY product, with warranties and a RECOGNIZED brand.

Nine times out of ten, a new potential customer will be more concerned as to whether you have locally available partners who can maintain sufficient stock and honor the warranties. Price comes further down their list. They have all tried the cheapest products and all got burned. We have all learned the important lesson: you have to pay for quality!

This scenario has played directly into the hands of the OEMs and unfortunately, more often than not, into the hands of unscrupulous manufacturers of counterfeit products. This can be highlighted by the fact that HP pulled out of East Africa because they simply could not fight against the counterfeit product.

Certainly, the larger players have suffered declines in their businesses because of the pandemic. Yet, I cannot emphazise enough that anyone who offers quality products, with locally available stock, with full warranties and distribution is going to succeed.

If you have a brand that is recognized as the market leader and you can get the quality, deliverability and the warranties right, then the future looks very bright indeed.

Let me make it very clear: should one of the larger manufacturing groups make the decision to start producing/manufacturing on this continent, especially with the African Continent Trade Agreement being finalized, it will get the lion's share of the opportunity!

Having been in this industry for the past 30 years, and now sitting in one of the most difficult places on earth to do business (for so many reasons) I can only conclude that we are sitting in exactly the right place, at the right time. The issue here is not where are the opportunities but how best to build on these opportunities and with whom. ■

Stuart Lacey

South Africa-based Lacey is a 30-year pioneer of the offi ce equipment and supplies industry and is keen to introduce key global suppliers to the big buyers across the African continent with RT VIP Expo one day intensive events in Nigeria, Tunisia and Ethiopia. Please contact <stuart@delace.co.za>

RT Global Partner For Africa

Gustavo Molinatti

Vertical Integration in the Latin Aftermarket: the Next Step?

Perhaps the forward integration of printing, software and logistics solutions is the next necessary step for many Latin companies.

Consolidation is an unavoidable fact in every maturing industry and, to some extent it is a healthy thing. The golden age of the early 2000s where distributors or suppliers of image supplies appeared overnight—without references, many of dubious quality and without provenance—is in the past. Those who maintained quality and were willing to adapt to changing business conditions managed to survive and reached the present. The question goes begging: What's next?

Vertical integration: advantages and disadvantages

Vertical integration is a business strategy in which a company acquires the business of its suppliers or distributors (or both) to achieve greater control of the supply and service chain. By making this purchase, the company achieves a competitive advantage over those companies that work independently and without integration.

In the U.S., clone imaging has determined the value of integration (see article at page 18).

Such integration offers an advantage in terms of market control, better pricing and the avoidance of disruptions to your supply chain. However, the merger of different companies could be difficult to manage (financially, culturally and in human resources), and be less flexible to changes and trends. It could even lose business focus.

Latin America backward or forward integration?

There are different types of vertical integration. The usual ones are "forward" and "backward" integration. Others may call it upstream and downstream. In the first case, companies are integrated forward, that is, towards the end-user, generally those that distribute or sell their products. Backward integration goes in the opposite direction away from the end-user. In such cases, these are companies that produce the raw materials and components used in the manufacture of their final products.

Typically, the distributor or supplier of the Latin aftermarket buys its supplies from different suppliers (sometimes locally, but usually from China) and in general does not usually unify its purchases in a single supplier. Backward integration would appear to be a difficult strategy to achieve for the scale of the LATAM region. However, many Latino companies began to opt for a forward integration, in the form of alliances or acquisitions, to achieve a competitive improvement in the approach to customers, thus establishing their own distribution network, offering printing services, technical support and guarantees, among other benefits. Through this closeness with the client, it acquires a greater knowledge of consumer behavior, adjusting its offers and generating a lasting relationship with the client.

Post pandemic printing solutions

As we saw throughout the pandemic, global business closures fueled telecommuting and digital transformation, turning countless homes into small offices. This migration drove a greater demand for services and products, such as multifunctional devices for printing of medium-to-low range inkjet or based on systems with embedded ink tanks.

OEMs have already taken note of this new business focus, launching solutions to meet this demand, and anticipating that it is very likely that the remote work and study modality will continue as a trend in the near future.

Cloud-based solutions and personalized services can be transformed into new business growth opportunities and the consumer market can become a tasty slice of cake that everyone will want to get their teeth into.

For the Latin aftermarket, this represents a great opportunity but it requires integrating adequate solutions to compete with quality, economy and safety. Perhaps the forward integration of printing, software and logistics solutions is the next necessary step for many Latin companies. ■

Gustavo Molinatti

RT Global Partner for Latam

Molinatti is based in Buenos Aires, Argentina and is publisher of Guía del Reciclador—the Spanish language magazine first published in 2002 for the Latin American printer cartridge aftermarket. He has organized more the 20 technical and MPS training events in several countries and is helping RT bring VIP Expo events to Brazil, Argentina, and Perú. Please contact <info@guiadelreciclador.com>

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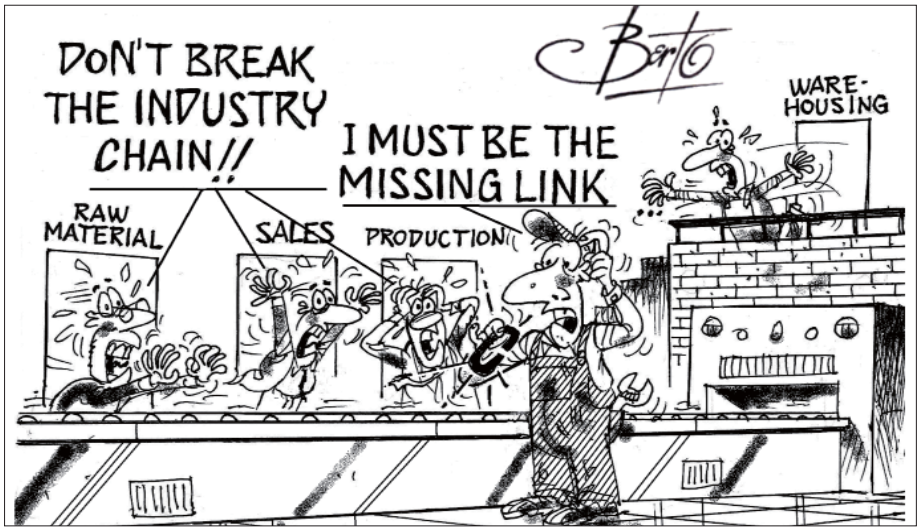

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