

LIVING IN A

TEMPORARY

IMPACT OF HYBRID

PAGE 06

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PAGE 18

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IMAGING VORLD No. 123 | 2022

09 | REFILLABLES

How to Compete with OEM Refillable Inks?

17 | OPINION

The Growth of Inkjet in Latin America: New Normal or Temporary Bubble?

20 | WIDE FORMAT INK

How Many Really Know About Wide Format Ink Applications?

23 | THE LISTS

Berto's last laugh over cartridge cost





The cost of printing in color has always been a challenge. But, Chinese phone maker Xiaomi has now released its Mijia multifunction ink tank printer promising high-precision, sharper printing for just 0.0015 cents per page, or 6 pages for a cent!

FEATURES

06 Small But Mighty —Mark Davis

Inkjet's smaller initial outlay, adaptability within the home setting, ease in setting-up and use all add flexibility and ease for the hybrid worker.

10 Behind the Eight Ball —James Douglas

Once the disruption has occurred, that first cartridge experience is the most crucial and comes under the most scrutiny

14 Digging Deeper into Inkjet's Market Share

-Graham Galliford

The better way of looking at market share is to examine the page volume share.

18 Why Dyson Failed with Their Electric Car

—Darren Turner

If you are designing a product or service, you've got to price it according to the value it provides against what the market will pay.

EDITORIAL

Canon first released its Bubble Jet ink printers in 1985. Some of you reading this may well remember that.

Canon's BJ-80 was the world's first inkjet printer to employ Bubble Jet technology. The cartridges and print heads used in a Bubble Jet printer are almost the same as in an inkjet printer, except that a tiny heating element is used inside the nozzle. The ink is vaporized every time an electric impulse reaches the heating element, thus creating a bubble which expands, forcing ink onto the paper. Typically, there are 64 or 128 tiny nozzles in a Bubble Jet printer.

But now we find ourselves in a different kind of "bubble." Brought on by COVID-19, we had hoped that things would have returned to normal before this. Some businesses have prospered. Others declined or disappeared altogether.

A3 continued its decline. Some A4 sectors prospered. Particularly for inkjet. And if the contributors to this issue are right, many workers will continue to work from home and use inkjet printers even if not every day. The hybrid workplace may not be a temporary bubble but a permanent way of working for millions. Many of them being your customers.

We have looked at inkjet from several perspectives in this issue with the intention of not so much "bursting your bubble," but helping you to grow comfortably in it



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Mighty n the Inkjet Printer Market 🖉 Mark Davis



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We all remember the old way of working. Sat in offices Monday to Friday, 9am 'til 5pm, come rain or shine. The printer, great in stature and importance, sat whirring away in the background. It was, after all, the 21st century equivalent of the water cooler. Colleagues would huddle around it to catch up on the office gossip whilst collecting

their printing. A less conspicuous place to gather than around

the coffee machine or in the corridor. And there's an argument of still doing

'work' in collecting the printing. Brilliant!

Then the pandemic hit...

Two years have passed, and our ways of working have changed beyond recognition. Home working trends now dominate the workplace. With the 'shock period' of the pandemic now behind us, knowledge workers are keen to keep the flexibility and work-life balance new routines provide. As a result, most employers offer a hybrid working model consisting of a couple of days in the office and the rest of the week working from home.

What d'you know, employees actually like working from home! Keypoint Intelligence's Future of The Office survey (conducted in November 2021) concluded that workers preferring a hybrid system rose 7% in Europe on the results from the same 2020 survey. In the US, the increase was higher at 11% compared to 2020. With most employees agreeing that their productivity was not affected by home working in 2021, it seems most are reluctant to give up their new routines and freedoms considering the autonomy associated with home working.

What does this all mean for the printer in the corner of the office? For the few days the office is in use, it means blowing the dust off the loading tray and getting back to printing those documents. For the days employees are working remotely, it means moving the spotlight over to a different type of machine: the humble inkjet.

Hybrid workers want flexibility and ease in their printing

With over half of the survey responders expecting to move to a hybrid working model as of Q1 2022, creating a more permanent home-working solution with the right technology in place is a must. Laser may have won in the office because of its business-centric market focus, but it's inkjet taking the remote working scene by storm. Usually reserved for the school geography project or family photo grandma wants a copy of, inkjet is proving to be the number one choice for the price-conscious hybrid worker. The Future Office survey discovered in Europe, 70% of work-related printing conducted at home took place on an inkjet device. That equates to roughly 60% in the US. But why is this the case?

The rationale behind the hybrid model of working is fueled by a need for flexibility. Hybrid working provides the best of both worlds: collaboration from face-to-face contact in the office, freedom and flexibility in working from home. Inkjet is winning in the remote working scene because, as a consumer market, it complements the benefits associated with the home-working model. The value of inkjet, in terms of market share, is due to increase from 8.8% in 2018 to 13% in 2023, proving that remote and hybrid working is helping to move the needle within this area of the industry. Inkjet's smaller initial outlay, adaptability within the home setting, ease in setting-up and use all add flexibility and ease for the hybrid worker.

Type of Device Used



Q18: What type of printing device do you use in your home office for work-related printing?

_ Types of devices used for work-related printing in home office

Online Purchasing Rockets

As with everything, cost plays a major role in the decisions hybrid workers make. Those who purchase the printing device with their own money are more likely to pick an inkjet printer because it's a cheaper initial outlay than laser and is more convenient to run and maintain. Workers want to be able to pick up ink from the local store whilst doing the weekly shop or order it for next day delivery on Amazon. Of course, workers are likely to splash out more on a device they can expense back to the company. As it turns out, it's nearly double what they would spend with their own money.

It's no surprise that online purchasing continues to be the top form of acquiring a printing device for the home office, outstripping in-store shopping considerably. Compared to 2020, online purchases have grown over 10%, with 74% of workers using their own money and 76% of expensed purchases taking the plunge online. Where is most of this money going?

A company that shares its name with a South American river spring to mind... Is it that much of a shock? When Googling "Top Selling Printers", Amazon's name is at the top of the page.

Providing a comprehensive list, they break down each of their device choices by features, benefits, and costs. A price-conscious worker can select a reasonably priced model, add in the relevant ink to their basket, and have the device up and running in their home office the following day. Again, it's cost drives consumer's habits and behaviors. In Europe, a quarter of those surveyed by Keypoint Intelligence only ordered the print device from the manufacturer's website if the cost was expensed back to the company. For those using their own money, it was a measly 13%. Regardless of who is paying the bill, workers want efficient, effortless service, meaning the popularity and growth for online purchasing is going to continue to rise.

With growth in online purchasing, and the demand for more flexible working solutions also increasing, "Print as a Service" packages are becoming a popular option for hybrid workers and companies who want to streamline and automate their print procurement process. Using a subscription model, many manufacturers and third party provides supply a device along with other extras such as consumables, regular maintenance, and extras such as reporting. 60% of US survey participants are provided with a resupply plan paid by their company or have set up a resupply plan that their company pays for. Hybrid workers want ease and convenience, so inkjet resupply plans that take care of procurement and maintenance is far preferable to purchasing supplies on an ad-hoc basis.

Inkjet = Happy Hybrid Worker?

It's undeniable that hybrid working has made an enormous impact on inkjet printing. From the survey alone, steady increases across the board account for the purchase and use of inkjet technology, and there are some great models out there - including All-In-One - that will provide hybrid workers with great print quality and functionality. However, as hybrid working becomes the norm within working routines, the question must be raised of whether inkjet is the most long-term cost-effective solution. With printing among younger people up 10% from 2020, the need for print is still very much there. It's up to companies over the next few months to consolidate their procurement policies and encourage hybrid workers to try alternative technologies, such as Ink Tank, by providing the financial incentives necessary. The savings for both employer and employee, in the long run, could be vast.

How to Compete with OEM Refillable Inks?

According to IDC, ink tank printer shipments exceeded 9.53 million in units in the first half of 2021, up 43.96% year-over-year. Epson alone shipped 6.12 million ink tank printers in the period, accounting for 64.17% of the overall ink tank printer shipments.

Looking at this trend, the use of ink tanks has become the main contributor to the success of inkjet printer technologies and growth will continue in the future. To this end, the demand for refillable inks will also grow accordingly. It is a welcoming opportunity as well as a challenge to aftermarket ink manufacturers.

Why? The aftermarket ink manufacturers must compete with the OEMs to provide good quality refillable inks at a comparatively low price. That means ink manufacturers will have to manage to deliver OEM-equivalent printing quality while controlling costs. It requires years of expertise in the management of raw materials and the development of formulas. OEMs patent the design of their bottles as well. So, the fear of bottle design infringement is another concern that has to be addressed by aftermarket ink manufacturers. It requires innovative workaround solutions to be developed to avoid infringement.

ΠΠΚ-ΤΔΠΚ

As a professional manufacturer of compatible ink cartridge with more than 25 year's industrial experience, Ink-Tank has researched and developed its own unique secrets to offer OEMequivalent refillable inks.

Based on adequate testing verifications, a good manufacturer, such as Ink-Tank, will use different ink formulas for different products to make sure inks can perfectly match the printers in which they will be used. This strategy also promises end-users a positive printing experience with good printing quality and a prolonged lifetime for the printheads.

Utilizing excellent raw materials, colorants and piezo technology, such as those used by Ink-Tank, refillable inks are able to print at a resolution of 5760 dpi, which fully restores the true color of the object, delivering OEMequivalent prints. In addition, Ink-Tank's inks are filtered through 1um, 0.5um and 0.2um three-stage filters. Such a fine ink cannot only reduce the damage to the print head, but also effectively protect the print head from clogging.

To avoid patent infringement, Ink-Tank utilizes self-patented cylindrical ink nozzles, which can make full use of inks without and ink leakage or jamming. Adopting an integrated bottle design, its ink bottle can directly eliminate ink leakage at the connection point of each part.



70ml Epson-544BK-CMY ink-tank ink bottles (for business inkjet printers)



70ml Epson-554BK pigment ink 70ml Epson-555PBK-CMY-GY ink-tank ink bottles (for business inkjet printers)



127ml Epson -524BK 70ml Epson-524CMY ink-tank pigment ink bottles (for business inkjet printers)



127ml Epson-504BK 70ml Epson-504CMY ink-tank ink bottles (for business inkjet printers)



170ml Canon-GI-10BK pigment ink 70ml GI-10CMY ink-tank ink bottles

Behind the Eight -Delivering an OEM experience with

You know the term "starting behind the eight ball?" It refers to a position in game of pool (or billiards) where you are being in an unfavourable or uncomfortable position. That's exactly where all aftermarket products are positioned — no matter the

James Douglas is an award-winning entrepreneur based in Sydney and has become a trusted supplier of imaging components and products and advisor for retail businesses across Australia. He is a recipient of the Excellent Service Award for his tireless efforts in personally driving to visit, train and mentor each and every one of his customers, providing them with dedicated support to remanufacture and sell high quality, non-infringing aftermarket supplies to their customers.

Ball aftermarket ink products
 James Douglas

quality, brand, or historic reputation.

End-users often claim OEM cartridges never have any issues. Yet no brand or product has a zero-failure rate. Even a Rolls Royce car can break down. But customers' perceptions create their own realities and those are the standards we as the aftermarket resellers are judged by. Operating under these conditions will always leave the aftermarket "starting behind the eight ball" before a thirdparty cartridge is even installed.

A customer's perception of their printing experience and reality about cartridge performance are two different things. With an OEM "print experience," the customer does not even think about the cartridge. They click the print button and seconds later they have a perfect image in their hands. Their OEM "cartridge perception" is the cartridge will install easily, be instantly recognised by the printer, show full ink levels, prints first time, every time without a blemish, does not fade or smudge, and gives them full page yield. The only time they think about the cartridge is when the printer tells them they need a new one and the auto pilot switches on to purchase another replacement.

The tough ask for every aftermarket reseller is to disrupt that autopilot habit and get their end-user customers to try their brand cartridges instead.

Because end-users believe the OEM is the best quality, you are left with price as the leading disrupter and availability as a secondary opportunity.

Once the disruption has occurred, that first aftermarket cartridge experience is the most crucial and comes under the most scrutiny. This is where most repeat business is won or lost and there are steps you can take to increase the odds in your favour. I'll come back to those later.

To keep customers coming back for more aftermarket cartridges—but more importantly keep them coming to you and not another aftermarket brand—you need to control your customers' mindset like the OEMs try to do. When many OEM customers are approached with a cheaper option, they don't consider it because they think the potential risk of poor quality, wasted time, warranty issues or printer damage is greater than the reward of saving a few dollars. So, they pay more and stick with the safe option they know.

A cartridge is judged on its current performance each and every time. If there is any print issue at all, many customers will apportion blame to the aftermarket cartridge being the cause, regardless of whether it is the real issue or not.

Guilty until proven innocent. There's that eight ball again.

However, if the exact same issue occurs with an OEM cartridge the customer's mind set is totally different. They consider other possibilities. Maybe the head needs cleaning. Or the drum needs changing if it's a toner. Maybe the file or printer cable have a problem. Is the paper damp? They give the cartridge a few taps and try reinstalling it again.

The OEM cartridge is innocent until proven guilty.

Aftermarket cartridges are not afforded that luxury. We operate under a cloud of suspicion and doubt. Human nature operates under the premise, pay less = not as good.

Repeat customers who have happily used your aftermarket cartridges many times before may give you a slight leeway if they have an issue. But just as many will drop your brand in favour of trying another or going back to the OEM the first time they experience a problem.

On top of the standard print quality comparisons of colour, sharpness, durability and to a lesser extent page yields, the OEMs have added firmware updates to the mix. If the printer won't



accept the aftermarket cartridge and print, then the game is over for most. Making sure you have the latest chips installed is critical.

Disrupting and winning the business is only the first battle. Retaining that business is the greatest challenge. As aftermarket resellers, we have far more

threats to our businesses than the OEMs must deal with. We primarily win the business from the OEMs because of price and that

opens the door for your customers to consider other aftermarket brands at even cheaper prices. Your business becomes directly exposed to people with the cheapest offers. New or late entrants only have price as a way to break into the market. Many don't hang around for long, but they do cause short term damage and inevitably are replaced by yet another "bottom feeder," or scavenger, trying to carve out some market share. The OEMs have a love-hate relationship with such people. OEMs love the "bottom feeders" that give the aftermarket a bad name and push endusers back to them seeking better quality. However, they hate the cheap prices.

Most consumers still see only two options, OEM, or non-OEM. A wide

Disrupting and winning the business is only the first battle, retaining that business is the greatest challenge.

section of the market is still not mature to the point of understanding there are different levels of aftermarket cartridges. Our job is to educate the market about the good alternatives to OEM.

The aftermarket's biggest enemy is not the OEM. It is these "bottom feeders" that sell inferior and/or infringing products but claim to sell high quality. They are the ones driving customers back to the OEM and damaging sales for the rest of us. They are the ones drawing added attention from the OEMs on patent infringement and give the OEMs an opportunity to talk down aftermarket quality.

In 2016 I heard the well-known industry leader, Steve Weedon, talk at a conference where he referred to

> the importance of giving customers a "trouble-free print experience." That statement encapsulated several key points I had been aiming at for years

but had not yet been able to articulate into a statement.

Providing a trouble-free printing experience moves the aftermarket price debate from the lowest price to a competitive price. A trouble-free print experience is what consumers want and is one in the same as an OEM experience.

A stable sales platform stands on four legs. Remove one of the legs and your



business becomes vulnerable and ready to be pushed over.

1. Price competitive NOT cheapest price. This is a balance of price *vs* quality;

2. Convenience. In stock now, easy for end-users to access quickly or speed of delivery;

3. Trouble-free printing experience. Sell the best available products that offer reliability, durability, up-todate firmware chips, full page yield. Short cuts lead to long term customer loss;

4. Knowledge: spotting customer threats, fixing issues fast, stating facts, displaying confidence.

Put the odds in your favour for repeat business. Identify threats and address them before they potentially cost you margin or lost customers.

Consider these following scenarios, the customer:

- buys a full set of cartridges or a value pack;
- brings an empty cartridge into the store to make sure they buy the right one;
- says they have just been given a printer;

If you identify and address the potential threats to a good printing experience with the customer up front, you are ring fencing that customer off from being stolen away on price from the bottom feeders.

• says they've been on holiday for 3 months.

These all seem like good things, BUT each is also a potential threat to future sales. Each of these scenarios could potentially lead to a bad experience of either, cartridge rejection, scratchy prints, bad colour, lines on the page, no image at all, lots of head cleans.

If you identify and address the

potential threats to a good printing experience with the customer up front, then you are not only heading off an issue, but you are also seen as giving great service. Consumers will recognise you as an expert. They won't get that service and knowledge from an online store or other retail competitor. You are

> minimising any chance of that end-user from being stolen away on price by the "bottom feeders." These consumers will gain confidence and start to trust your recommendations on products. When there is

a genuine product issue, they will trust you to fix it and not just run back to the OEMs.

We are always going to be starting from behind the eight-ball but we can employ clever tactics along with selling the best quality aftermarket product that the industry can manufacture to change or improve the outcome and gain long term success.

Digging Deeper into In

E Graham Galliford

Market Share of Inkjet

When considering the market share of a market that has differentiated product approaches there are complications to be resolved. Firstly, the market itself has to be defined. In this article the market is defined as "the market for business/personal printing." Print devices utilizing inkjet technology, as the reader I am sure knows, encompasses not only desktop business printers but also a broad swath of markets including wide format printing, commercial print-for-pay printing, packaging printing and industrial printing of all manner of items including carpets, tiles, electrical wiring and components and many other items. We are confining the analysis to that of business/ personal printing.

> The market not exclusively served by inkjet printers. The complication is that the two major technology platforms address the market and have different cost/price structures. As I have written before, I believe that the better

way of looking at market share is to examine the page volume share. It should be noted that, in addition, the business/personal printing market covers a broad range of printer duty cycles and inkjet does not cover the whole range. Toner based printers address every sector from the desktop to central printing departments in businesses. The market coverage of inkjet technology printers is not the same as that of those using toner. So, when considering "the market share of inkjet", it is important to confine the analysis to their common market sector, "business/personal office printing" typically served by desktop printers. Due to the differing cost/price characteristics

> or each technology we need to carefully consider the manner in which we measure "market share." One good measure of market share is actually that of page volume for each technology. The following chart shows the market share by page volume for each technology for desktop office printers from 2018 to 2024.

kjet's Market Share

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Things to note are that, whilst there was minor growth in page volume in 2021, the total desktop business/personal printer page volume has and is expected to further decline by a negative compound annual growth rate (CAGR) of -5.51% over the entire period of 2018 to 2024. This comprises for business/personal inkjet page volume by a negative CAGR of -4.4% and for business/personal laser for the same period is -2.75%.

The page volume share for each technology in 2021 and 2024 is shown in the following pie charts. Whilst there is overall page volume decline and decline in both technologies the share shifts in favor of laser over inkjet.



This is in spite of the fact that toner-based printers are at a small disadvantage total cost of ownership per Page (TCO). TCO includes capital cost for the hardware, cartridges, and other running costs. In the US, the typical current TCO for typical office inkjet printers is US\$0.0135 for monochrome and US\$0.0493 for color printing. This compares to US\$0.0287 and US\$0.0877 for color for office laser printers of similar class. Using these metrics, and incorporating the split by print type as well as factoring in cost increases, market share by value is illustrated in the following charts. Firstly, looking at value share by page type for each technology and the forecast for 2024 the data is as below.



Secondly, looking at market value share by printer type the data is as shown here.



Again, this shows that the market share of inkjet is declining slightly in contrast to the laser printer segment along with a decline in value. It should be noted that the total market value is also declining but the value share held by laser will increase slightly.

Looking at the changes in the global installed base of business/ personal printers and the split between inkjet and laser we see the following.



As can be seen, there is predicted to be a continued decline in the installed base of all printers. This is of course signaling a change in work practices by digital transformation. The installed base of inkjet machines will however decrease more steeply than of toner-based printers.

The Market Share of Inkjet OEMs

The foregoing analyses looked at the share of the market by print volume and that of the compounded value of the cost of ownership. By contrast the hardware market share is differently measured by hardware value. The global total inkjet printers market size, including was valued at USD 34.24 billion in 2019 and is expected to expand at a CAGR of 5.3% from 2021 to 2027. The breadth of application of the technology is extremely wide compared to that of toner-based printing. Business and personal printing is a smaller portion of the total. This is illustrated in the following chart of US printer shipment

value for all segments of the inkjet market. The global market for inkjet printer hardware shows similar diversity but regionally the split is different.



As can be seen the portion of the US market value that is constituted by business/personal printers is about 36%. The total inkjet market is seeing the packaging industry witness rapid growth across the globe due to huge demand from the e-commerce transport and shipment, food and beverages, personal care, household care, and healthcare industries for convenience-based packaging. This growth is creating a great demand for inkjet printers for packaging purposes, which one of the major factors driving the market. However, when considering the desktop office printers, the situation is somewhat different. There is predicted moderate growth in the value of printer shipments with multifunction printers at a CAGR of 6.71% and desktop printers at 3.32%. This value is in contrast to the negative growth shown for page volume and overall market value and is affected by the preferred adoption of multifunction printers as well as declining duty cycle.

Evaluating OEM hardware market share, there have been some shifts in share. This share breakdown varies according to region and country. HP still owns the largest market share, but Canon has been gaining and is a close second in market share.



Analysis

So, taking the foregoing and looking at overall trends, it is apparent that there are subtle shifts that are affecting the business/personal printer markets for inkjet as well as for laser printers. Worldwide page volumes printed from office printers were severely down in 2020, due to many offices being closed and many remote workers are not able to print at home. This is not only because of "lockdowns" but also as the Covid-19 pandemic changes where and how work is done. Home based printing for business helped there be a minor increase in page volume in 2021 but it is predicted that page volume will see a negative CAGR in the foreseeable future.

Gustavo Molinatti



The Growth of Inkjet in Latin America: New Normal or Temporary Bubble?

What do you think? Is this phenomenon part of the new normal or a temporary bubble?

While global shipments show unstable or declining values as a result of problems in the supply chain, inkjet devices with built-in tanks continue to grow in the Latin region. This is a phenomenon that began years ago and but was hastened with the advent of the COVID-19 pandemic. Some argue that it is a trend that is here to stay. Others think it's just a temporary effect, fueled by those working remotely. And given the eternal struggle for domination between laser and inkjet, I asked several entrepreneurs if inkjet has become the new normal or is it just a temporary bubble.

For Martín Bignasco of Blue Box Argentina, "It is a trend that has been accelerating," he said. "For a few years, now, the faster inkjet equipment has come into the market, with quickdrying inks. These technologies would eventually replace the laser technology normally used in most companies." He added, "The operating costs are much cheaper and the electricity consumption is infinitely lower, which makes them more attractive for those companies concerned about the environment." According to Bignasco, we must also consider the savings the new inkjet printers provide over laser when it comes to the huge tonnage of waste that is generated once the empty cartridges are thrown away.

From the center of the continent, David Aguila López from Inkfinity México is certain. "I don't think it's a bubble," he said. "Inkjet is what's going to remain," he said without hesitation. "Toner may



have been the leader until now, but that is no longer the case. Add to that, the fact that all printer OEMs are now launching equipment containing bulk ink or continuous ink systems. This is really a way to provide a more cost-competitive solution for end-users." According to López, this highlights the convenience offered by these newer inkjet technologies where endusers can avoid frequent trips to a store to buy supplies. "Having high-performance tank printers has become a better option," he added. "The inkjet is today's fasto r convenient food for your printer—it is the convenience of not having to go out to buy."

Cássio Rodrigues from Katun Brazil, a well-known reference in the Latin American remanufacturing region, offers a different diagnosis. "In simple terms, I don't believe in the bubble or the new normal. While the ink business is growing, the laser business is reinventing itself too. I think there is room for both types of printing. In low-volume printing services, inks are very competitive. For high volume, while the cost per page is very low, the investment in the equipment is very high".

Martín Waldeck from Danston Uruguay believes that the pandemic has greatly changed printing habits among users. "The fact of teleworking, a modality that had started timidly and has now become much stronger, makes these types of users continue with their ink tank printers, which are the ones that have been rapidly gaining ground in recent years. Today if we look at the supply of printers, there are few new models that work with cartridges. In other words, the inkjet and especially that which works with ink tanks (CISS) are part of the new normal".

What do you think? Is this phenomenon part of the new normal or a temporary bubble?

Gustavo Molinatti

RTGlobal Partner for Latam

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Why Dyson Fail Electric Car Darren Turner

I try to learn from the success stories of certain entrepreneurs... from people like Richard Branson, James Dyson, Elon Musk and even Jeff Bezos.

It's not so much about "liking" them as people. It's about respecting what they have created and achieved.

Each of these individuals have brilliant minds and have risked everything in the quest to create something marvellous.

That said, even these successful people have gotten caught up in the moment and not been able to see what the market needs at a particular time. The saying goes, "couldn't see the wood for the trees."

Some talented people believe if you build it, the people will come. However, the product or service still needs to solve a problem, make our lives easier or save a bucket full of cash.

Let's look at Sir James Dyson and his quest to build the best electric car in the world. Like he's done with the vacuum cleaner and the hair dryer.

I believed Sir James was doomed from the start. Why? Because he had set the bar too high in what he perceived was the correct entry level requirement.

According to research conducted by British roadside assistance service, RAC, most drivers only drive an average of 30 miles (50km) a day. And they only embark on one long 600-mile (1,000 km) return journey once a year.

This research also indicated most drivers wouldn't give up their fossil fuelled cars until the range of electric vehicles got close to this magic 600-mile mark.

Armed with this information, Dyson

ed with Their

Darren Turner's story began in 2003 when he opened a retail store in the UK selling printer supplies to home users & small organizations. Since then he has moved into a business unit, grown his team and continued to adapt to match his customers' changing needs.



He has developed a 'fit for purpose' office products and solutions business model that provides certainty of cost and service for small business, charities and schools—thus providing them complete peace of mind. He has become a trusted advisor for small organizations across the world.

set off on a journey of discovery, and along the way completely redesigned many aspects of the traditional motor car.

The most distinctive features on the front of a Dyson are its slim headlights and the narrow air intakes, and on the flanks are the curved bodywork creases that orbit the car's wheel arches.

Dyson ditched conventional door mirrors. In their place are stalks with rear-facing cameras, which would have provided video feeds to a pair of screens on the car's doors.

Dyson had also designed an uncluttered cabin. The seats are the most striking feature, with Sir James saying he wanted to move away from the "1930s armchairs" cars today have.

"We wanted a more elegant, structural seat, with well-considered posture support," he said. "When you sit in



this, it gives you that support in all the right areas. The car has three rows of seats, capable of seating seven adults in comfort."

According to Dyson, the electric SUV was meant to ride on huge 24-inch wheels, claiming this would have improved the ride quality and allowed it to ride 'more easily' over potholes and speed bumps.

Dyson had developed its own powertrain. However, little is known about it, other than it's of Dyson's own design. The car would come with two, one powering the front and the other the rear.

While Dyson hasn't revealed many details on the electric battery technology, it confirmed the car's battery pack compartment was designed with multiple battery pack sizes in mind, with the largest, allowing a range of up to 600-mile on a single charge.

Then, in 2019, Dyson announced they were scrapping plans to build an electric car. The company had invested hundreds of millions in getting the project up and running and the car was expected to go on sale in 2021. "As a technology-based car – being developed by a non-automotive company – we realised that our car was suddenly nolonger commercially viable."

Most of the associated cost in developing this vehicle had been associated with the battery technology, and the desire for Dyson to produce a vehicle with a 600-mile range.

Like with Dyson's other products, he wanted to make it the best in the market.

But his set-in stone requirement of a 600mile range massively increased development costs. After doing his sums it meant the sale price would have been much higher than the market would pay.

In my opinion, the range issue was foolish: most people will never do a 600-mile journey. And, with the right planning, a quick blast on a rapid charge point mid journey will give you the extra boost you need.

Looking at the market today, most electric vehicle manufacturers provide options from 100-mile range up to a 300-mile range. With home, workplace, and public charging available, this works.

When buying his vacuum, hair dryer and straighteners people were willing to pay double the competition's price based on performance. But an electric vehicle is just not worth the double price just to get an additional 300-mile range.

If you are designing a product or service, you've got to price it according to the value it provides against what the market will pay.

It's the same with the office technology solutions. Developing and pricing something for the home is completely different than for the workplace, as workplace solutions get worked hard.

But it goes back to the same thing we started with, whatever it is you develop it's got to solve a problem, make life easier or save a bundle of cash.

...and you should never try to solve a problem that's not there in the first place.

How Many Really Kno Ink Applications?

With the development of wide format inkjet printing technology in the past five years, inks have become applicable to many other applications and fields.

1. Porcelain

Inks that have been grounded down to 100-200 nm can now totally replace glaze in traditional porcelain printing. Such inks can now be printed on to the tiles. Under 800-to-1200-degree heating, floor or wall tiles we have seen and used commonly in the past can now be printed using such inks.

2. Textiles

Though digital printing only accounts for 2% of the overall printing market, annual digital printing volume is as high as 1.5 billion square meters, and the required ink is about 15 million liters a year. Digital printing inks can be subcategorized into:

2.1 Reactive dye ink: which can be printed with bright colors onto cotton, linen, silk, and nylon. However, post-processing is complicated. The fastness is good on cotton and linen fabrics, but not so much on silk and nylon fabrics.

2.2 Acid dye ink: it can be printed on silk and nylon, with bright colors. The fastness is good on silk and nylon, but the price of these inks is high and the post-processing is also complicated.

2.3 Sublimation dye ink: can only be printed onto polyesters



w About Wide Format

(polyester fiber). When printing, the user must print the ink onto paper first and then attaches the polyester cloth to the paper. The fabric with the printed paper attached has to be placed into a heat transfer machine for transfer printing and color development to take place. Compared to other digital printing, thermal transfer printing does not generate wastewater. It is the most popular printing technique, accounting for 60% of all digital textile printing.

<complex-block>



adding polyurethane resin to ink, DTG inks can be printed on all fabrics, especially on cotton. More importantly, it will not generate wastewater, and is easy to access. The disadvantage is that ink price is very high. In addition, fastness and color brightness is poorer in quality when compared with other technologies, but ink manufacturers are improving this technique.

2.5 DTF ink: can be printed on all fabrics, especially cotton. Like DTG ink, it also uses pigments as colorants and adds polyurethane resin to the ink. However, the ink is printed on a coated PET film. Before the ink is dry, a thermoplastic material such as TPU is sprinkled and heat-treated to a thermal transfer film. Then it is out into an ironing machine attached to the fabric and transfer takes place at 150 degrees for 3 minutes. It also generates no wastewater and is easy to access. Unlike DTG inks, DTF has good fastness and color brightness. However, the ink price is also high. Given PET film costs and the disadvantages of transferred cloth (such as hard and airtight), the market share is still in its infancy.

3. Packaging Materials

3.1 Labels: Due to the special requirements of the label industry requiring small print runs, greater variety and short delivery times, only UV curable inks can be used in the inkjet printing field with a printing speed of 200 meters per minute, far behind the traditional 300-400 meters per minute.

3.2 Corrugated boxes: are subject to high printing cost pressures, so they are mostly printed on using waterbased dye ink in the inkjet printing field. The inks are low priced, enjoy high color brightness and are environmentally friendly. Some also use UV curable inks to print the corrugated boxes, which deliver higher



Textile sublimation ink for epson printhead

Textile sublimation ink for industrial printhead

color brightness, are water-proof and lightfast but are more expensive.

3.3 Soft material packaging requires fast speed and fast drying during the printing process so only UV-curable inks are competent if inkjet inks are to be used.

4. Advertising materials

In response to the special requirements of the advertising industry inkjet printing has almost replaced traditional printing. The demand for smaller quantities, more variety and shorter delivery times has pushed the inkjet industry to deliver cost effective results with the new technologies. Among them, water-based dyes or water-based pigment inks are used to print on the surface of material with water-based coatings. Eco-solvent inks are used to print on the surface of the material with an oil-based coating. If there is no coating on the surface of the material. UV-curable ink will be used.

5. Flags & Banners

The current solution in the inkjet printing industry is to directly print sublimation inks onto coated, polyester fabrics and then pass the

coloring machine at 180 degrees to complete the color development. It is a mature solution and almost replaces the traditional methods for the printing of banners.

6. Leather

Inkjet printing is basically used on leather where small print runs, individuality and complex flower shapes are required. On leather using a white background, inkjet inks with Eco solvent ink can be used. On leather where there is a background color (such as brown), inkjets with soft UV-curable inks are used. The latest technology is to use waterbased pigment inks with polyurethane resin added, which is the most environmentally friendly leather solution available at present. The costs are not high and this sector is becoming much stronger.

7. Glossy sticker

To print a glossy sticker for surfaces on any item, you only need to print the UV-curable ink on the release film which is coated with pressuresensitive glue (film A), and then attach the protective paper (film B). The user peels off the A film first, places the

sticker on the item, and then presses back and forth on the pattern with their fingers, and finally tears off the B film to complete the transfer.

8. Other materials

UV-curable inks are used to print on glass, metal, wood, and plastics because they can deliver a high level of color brightness and an excellent anti-rubbing fastness. If combined with varnish printing, the color is even more glossy, and the rubbing fastness provides a better product.

It is reasonable to believe that more wide format applications will become more convenient and popular in the future, driven by the development of inkjet printing technology.



*This article Trendvision, a

professional ink manufacturing company based in Guangdong, China. The company is committed to continuous improvement and innovation while maintaining high production capacity and stringent management standards. Its ink solutions are compatible for different series of desktop printers and various wide-format printers.



DID YOU KNOW?



The first patent was issued in 1772 in England for the making of colored inks, but it wasn't until the 19th century that chemical drying agents appeared, making it possible to use a wide variety of pigments for colored inks.

Source: https://justfunfacts.com/interesting-factsabout-ink/

QUICK FACTS



The earliest inks known to man were probably made with lampblack, a kind of soot which could be easily collected as a by-product of fire.



Ink was used in Ancient Egypt for writing and drawing on papyrus from at least the 26th century BC.



Chinese inks date back more than 10,000 years to the Chinese Neolithic Period and were made from plants, animals, and minerals including graphite which was ground with water and applied with ink brushes.



India ink was first invented in China using materials that were often traded from India. The traditional Chinese method of making the ink was to grind a mixture of hide glue, carbon black, lampblack, and bone black pigment with a pestle and mortar, then pouring it into a ceramic dish to dry.

BERTO'S LAST LAUGH



Some commercially available fluorescent inks glow very brightly when illuminated using a

black light or UV light.

Tattoo inks consist of pigments

combined with a carrier and are

that can be thinned or mixed to

available in a range of colors

Invisible ink is a substance used for writing, which becomes invisible upon application, and can only be made visible by applying heat, a second chemical or ultraviolet light.

Electoral ink is a semi-permanent ink or dye that is usually applied to the forefinger of voters during elections to prevent electoral fraud such as double voting. First used during the 1962 Indian general election, election ink uses silver nitrate, and excessive exposure can cause argyria.



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