Investing for growth and profitability

The role of digital printing in the world of labels

WHITE PAPER

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About the author

Long regarded as the 'Label Guru', Michael Fairley has been writing and talking about labels for some 35 years, both as the founder and publisher of Labels & Labeling and as a respected industry consultant providing market and technical research, training, workshops and strategy support to leading industry suppliers and converters.

He has written or contributed to numerous market studies published by organizations such as Frost & Sullivan, Pira, The Economist Intelligence Unit, InfoTrends and Labels & Labelling Consultancy, as well writing numerous technical books that include The Encyclopedia of Label Technology and The History of Labels.

Michael Fairley has been particularly instrumental in educating the label industry about digital printing, writing articles, running Digital Masterclasses and speaking at workshops, seminars, conferences and summits worldwide. He is the author of the best-selling Digital Labels and Package Printing book, now in its fourth edition, which has been incorporated as essential reading within the Label Academy series of education and training handbooks.

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Executive Summary

The world of labels is one of the fastest growing and most rapidly changing sectors in the entire printing industry, returning above GDP growth year-on-year for at least the last 30 years. Much of this growth has come from pressure-sensitive labels – perhaps more commonly known as self-adhesive labels – which have undoubtedly transformed the nature, use and applications for labels and been instrumental in the continuing evolution and rapid growth in the labels that we regularly see in everyday life.

In little more than 35 or so years, pressure-sensitive labels have come from a minority process to one that now dominates in market share in all the world's developed label markets, while edging closer to dominance in many of the world's emerging markets.

The rapid acceptance and investment in digital printing within the pressure-sensitive label industry over the past decade has undoubtedly had a major impact on this rapid growth, changing the way labels are designed and manufactured and how they can be used in exciting new ways for brand-owner marketing, brand protection and traceability. Indeed by the end of 2015, some 3,000 or more digital label presses will have been installed in the pressure-sensitive label industry worldwide.

No longer just about short runs, digital technology has been instrumental in revolutionising the way pressure-sensitive labels are produced and opened up new opportunities for brand owners and global retail groups to market their products in ways that were never previously thought possible. Combined with advances in the digital design, origination, artwork and pre-press stages of digital label printing, enhanced colour management and front end technology, and a better understanding of how to manage digital printing and workflows in the label plant, these evolutions have all moved digital label printing rapidly forward.

When looked at today, the overall value of digitally printed label jobs is also seen to be much higher than a printed cost alone, with industry estimates indicating that although digital label printing is currently less than 5% of all printed pressure-sensitive label jobs by volume, it nevertheless makes up in excess of 15% or more of all print jobs by value.

There seems little doubt that digital technology will be an essential and ever-growing part of the label – and package printing – industry's future. Those label printers and converters that investigate the changing market requirements for digital and invest wisely for the future, are those most likely to succeed in tomorrow's world.

Understanding the world of labels

It would seem impossible today for the worlds of retail, commerce, industry and distribution to operate without the use of labels. They can be found with multi-coloured illustrations on almost everything that we buy in high street retail stores, pharmacies, DIY shops, and even out-of-town hypermarkets and garden centres – whether products are pre-packed in bottles, tubs, jars, pots, trays or other types of containers, perhaps shrink-wrapped or even affixed directly to items as diverse as lawnmowers, tennis rackets, clothing or hardware.

Such labels are an essential medium that can be used to identify and help to market all kinds of goods, as well as provide essential consumer or legislative information such as weight or volume, supplier or manufacturer contact details, ingredients or contents lists and maybe storage, handling, healthy eating, usage or safety information.

In addition, almost all of these labels will carry a barcode – those patterns of black and white lines that are scanned at automated checkouts – to identify and price items on the customer's till slip. Barcoded labels of various kinds are also used in the manufacturing, handling, shipping and distribution sectors for applications as diverse as assembly and factory automation, in parts and components identification, and in the whole field of tracking and traceability throughout the supply chain. In one form or another, labels and barcodes have become an essential component of everyday modern life.

New label innovations in recent years have also seen the growth of special types of labels that are interactive with mobile phones so as to access websites, provide further consumer information, enter competitions, play games or become part of social networks. Some labels are even being uniquely variable or personalized, each label being completely different.
Little wonder then that labels of all kinds are one of the fastest growing (along with flexible packaging) of all the printing

sectors, averaging around 4-6% per annum growth worldwide for at least the last 30 years (current growth is estimated at 4.7%), and almost always achieving growth that is above GDP. Looked at on a global basis, labels are produced by a highly specialized niche printing industry sector with an estimated $60 billion plus current turnover.

Much of this label growth in recent years has been driven by globalization by the leading international brands, by the introduction of supermarket 'Own brand' labels, by moves to shorter and shorter runs, to more versions and variations, as well as to more and more product launches and reductions in lead times. Pressures to use more sustainable label manufacturing technology and materials, to introduce recyclable or re-usable labels, and to substantially reduce label waste, have also had a big impact.

Perhaps not unsurprisingly, both label materials and production technology have changed dramatically over the past ten or so years, with label producers having to rapidly adapt to these new challenges and opportunities – and invest wisely for the future. In particular, investing in digital label presses has had a quite dramatic impact on the way labels are now produced, on how they can also be used as effective marketing and communications tools, and on the industry's profitability

This white paper examines the label industry's challenges and opportunities in more detail and asses the historical, current and future roles of digital printing in today's fast-changing world of label production and usage.

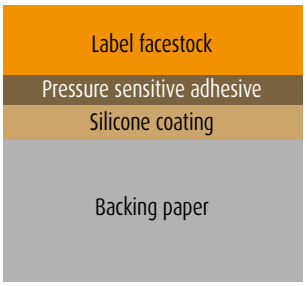
> "Labels are one of the fastest growing of all the printing industry sectors"

Decades of evolution and change

Ever since the early days of label printing back in the 1700s the label industry has been faced with changing packaging and end user demands – the implementation of new legislative requirements, advances in technology and materials, and ever-changing consumer and market pressures.

Indeed, up until the beginning of the 19th century labels were all produced on wooden letterpress printing presses using hand-made paper. The invention of iron presses and the continuous papermaking machine, the lithographic printing process and later, the ability to produce standard size bottles, preserve food in jars and cans, create decorative and colourful labels for products on sale in the fast-emerging grocery stores of the late 1800s, were all to create the beginnings of the label industry we know today.

Most of the early labels for bottles and cans were all printed on sheet-fed presses, cut to size and then applied using a wet-glue. Even up to the late 1960s wet-glue applied labels still made up more than 70% of all the labels produced worldwide. Today, they account for less than 40% in the developed label markets, and are still mainly produced on sheet-fed (offset) printing presses.
It was the emergence of pressure-sensitive labels (perhaps more commonly known today as self-adhesive labels) in the 1930s, and their rapid end-user growth since the 1970s, that has transformed the nature, use and applications for labels and been instrumental in consistent and rapid growth in the labels that we see today – and is not difficult to see why.



Construction of pressure-sensitive laminate showing backing paper and silicone release coating

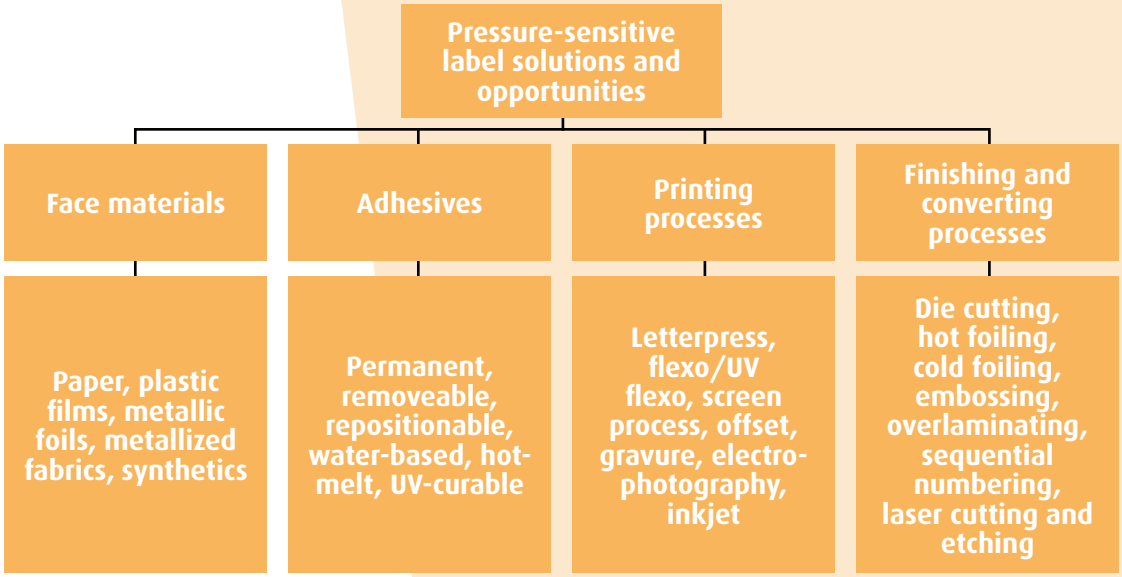
Rather than being printed on large sheet-fed presses, pressure-sensitive labels produced on narrow web-fed presses (commonly under 500mm/20 inches wide) are made-up of a sandwich construction that has the label face material, an adhesive, and a supporting silicone-coated release liner that can be peeled away at the point of application. In use, pressure-sensitive labels have the widest range of face materials of any label technology; they also have the widest range of adhesives available; they have more different printing and finishing process than any other types of labels.

Because of this, pressure-sensitive labels can offer more added-value solutions and opportunities, either all in-line or sometimes off-line, to a label user than other label technologies. This can be seen in the diagram on the next page.

With such a range of opportunities and possibilities it is not surprising that pressure-sensitive labels have become the dominant label technology in all the world's most developed markets, and are approaching market dominance in many emerging markets.

> "Pressure-sensitive labels have transformed the nature, use and applications for labels in recent years"

> “Recent years have seen a major change in the way that the label industry invests”



The range of opportunities, possibilities and solutions with pressure-sensitives has been particularly enhanced since the mid-1990s when the first generations of digital label printing presses were introduced to the market. Although slow to be accepted, initially because of reliability and manufacturing issues, new generations of digital label press over the past 10 years or so, have gained rapid market acceptance and have brought about a major change in the way that the label industry invests.

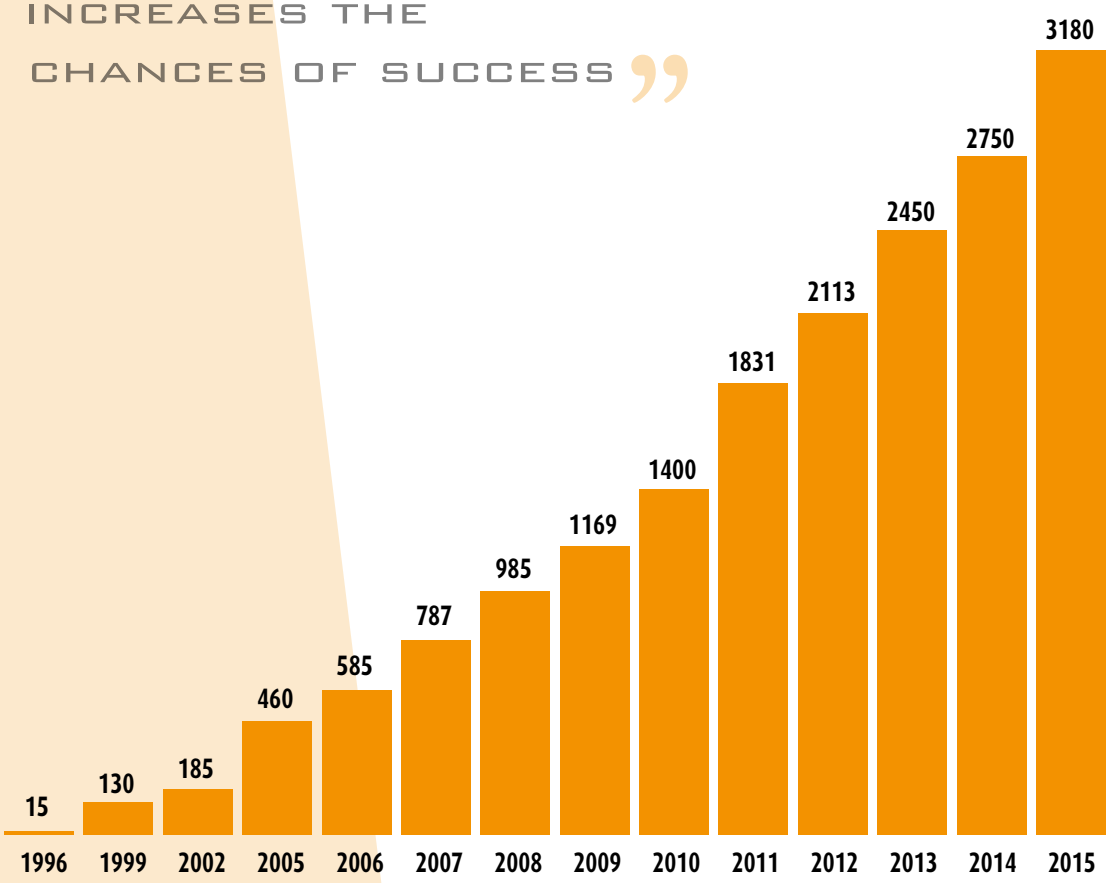
No longer just about short runs, digital technology has been instrumental in revolutionising the way labels are produced an opened up new opportunities for brand owners and global retail groups to market their products in ways that were never previously thought possible. Combined with advances in the digital design, origination, artwork and pre-press stages of digital label printing, enhanced colour management and front end technology and a better understanding of how to manage digital printing and workflows in the label plant, these evolutions have all moved digital label printing rapidly forward.

So much so, that annual installations of digital label presses are now close to 30% of all narrow-web press installations worldwide, with in excess of 3,000 digital label presses expected to have been installed worldwide in the label industry by the end of 2015. Looking to the future, digital label presses are forecast to make-up close to 40% or more of all annual narrow-web press installations by the year 2020.

It’s not just that digital presses offer the label converter more opportunities and solutions to grow the business, the majority of successful digital label converters also say that their digital production is more profitable than work produced on their conventional analogue printing presses.

Looked at today, the overall value of digitally printed label jobs is seen to be much higher than a printed cost alone. Industry estimates indicate that although digital label printing is currently only

> “Investing wisely increases the chances of success”



Total installed base of digital label presses 1996 – 2015 (estimated)

about 3% to 5% of all printed pressure-sensitive label jobs by volume, it nevertheless makes up some 15% to 18% or more of all print jobs by value.

Digital is also seen to bring in more business for the converter's conventional printing presses while opening new opportunities in the shorter run and niche unsupported film markets for sleeves and flexibles, with some 14% of label converters that have invested in digital presses now also producing profitable shorter-run, mid-to-narrow-web flexible packaging – sachets, pouches, tubes, pot lids, wrappers, bags, flexibles – as well as labels, often for the same customer.

More recently, digital printing has extended into new narrow-to-mid-web labelling applications that include shorter-run shrink sleeves on glass or plastic bottles, transfer decoration of pails and large tubs, some in-mould labels, and limited wrap-around label solutions.

While most digital label printing to date has been on narrow-web pressure-sensitive label presses, there are also new generations of mid-size sheet and web-fed digital presses starting to come to the market, which will further extend the opportunities and potential that digital can offer label producers – and their customers – in the coming years. Indeed, digital printing using new generations of larger format sheet-fed presses is also expected to have a growing impact on the wet-glue applied beverage label market and on folding cartons

There seems little doubt that digital technology is an essential and ever-growing part of the label – and package printing – industry's future. Those label printers and converters that investigate the changing market requirements for digital and invest wisely for the future, are those most likely to succeed in tomorrow's world.

An opportunity for growth and enhanced profitability

The pressure-sensitive label industry has long used the widest range of conventional mechanical printing technologies of any of the many different printing sectors, whether, letterpress, offset, flexo/UV flexo, screen process or gravure. They all have a purpose and place that can be used for different applications. Some can carry thicker ink films; some can offer softer and more realistic skin tones; some have harder or softer halftone dots; some are more economic than others. That's why they are all still in use – sometimes combined in one press line – on a regular basis.

What these conventional printing technologies have all traditionally suffered from is the ability to successfully compete in the production of ever-shorter runs or the need for multiple version changes. They cannot offer a different (personalized) image, sequential number or code on each label; they cannot offer instant repeatability of jobs at the press of a button; they all have to go through a platemaking or image carrier process, and they often struggle to give a guaranteed and consistent colour match.

It was to meet these types of challenges, and many others, that digital label printing was introduced in the mid-1990s. Initially not that well understood or applied in the early years, digital label production has since evolved rapidly in more recent years – both in terms of press technology and in the whole digital pre-press and workflow process. So much so, that the digital printing process is now widely used by large, medium and small label converters throughout the developed world and is steadily becoming established in many of the emerging countries.

Rather than competing with the conventional printing processes, digital should be regarded as complementary to them, offering new solutions and added-value applications, as well as cost-savings, which are otherwise difficult for the conventional label converter to achieve cost-effectively, or cannot be achieved at all.

As for end-use customers of digitally printed labels, these range from mass marketing campaigns by global giants such as Coca-Cola right down to small local businesses that require

> "Rather than competing with the conventional printing processes, digital should be regarded as complementary to them"

a few thousand labels, or even less, for their small plumbing, floral, electrical or mail-order companies. The benefits of digital today can be said to range across the whole spectrum of label producers and label users. So let's summarize some of the key benefits and opportunities offered by digital.

Digital offers label converters the ability:

To meet the changing market, technology and production demands and requirements of their customers

To reduce a range of costs while at the same time improving margins, so as to be more competitive and profitable on shorter runs

To be more innovative and to offer customers new added-value marketing solutions and opportunities that may include multiple versions, personalisation, sequential numbering or coding, security or brand protection features

To widen the converter's capability and provide an enhanced level of service and solutions to customers, e.g. short-run proofing or test marketing

To be more environmentally friendly by reducing materials wastage and eliminating plate and processing stages

Why invest in digital?

As already mentioned, digital label production technology – both pre-press/workflow and printing – should be seen as complementary to conventional analogue label printing, while at the same time offering new solutions and opportunities that can reduce some costs, add value and be a key element in increasing profitability. These key benefits are summarised in the flow chart below.

What the digital adminstration, workflow and printing process offers the brand owner

1 Seamless workflow	An integrated and seamless workflow gives reduced errors, minimal peprwork, provides quick response and enhances management and customer information. Reduction in lead times
2 Cost efficiences	No plates, no plate making time, no ink colour matching, no registration problems, colour matched proofing, exact quantities printed, revisions under control
3 Production benefits	Guaranteed proofs, 3D visualising, short-run proofing, enhanced colour gamut, reduced time to market, reduced or zero inventories, improved supply chain management
4 Marketing opportunities	JIT production, versioning, variable design, unique/sequential coding, mass customisation, custom and variable images, new promotional opportunities, seasonal or event promotions, personalisation
5 Environment & sustainability	No water, solvents or chemicals, exact quantities, reduced print waste, reduced set-up, no plates, less material and ink used, no UV energy costs (toner), exact quanties, product lifecycle management
6 Brand security	Security design backgrounds and features: guilloche designs, variable images, micro text and anti-copy images, security foils and cuts, instant verification with smart phones
7 Track and trace	Security numbers and bar codes, matrix codes, hidden codes, matching printed codes to hidden codes, provide print-out info, now being combined with smart phone technology

> “Seamless workflow is an essential requirement for successful and profitable digital label production”

With both analogue and digital printing capabilities label converters have more flexibility to switch between processes (depending on run lengths), flexible press availability, flexible timescales, easier job repeatability, possibilities for personalisation or short-run versions, and perhaps adding security features. Digital can also provide a capability for short-run proofing or test marketing, even for jobs that may eventually be produced on conventional flexo or offset presses. Automating workflow in the digital plant will also enhance production flexibility.

Put together, the benefits of offering digital capabilities are spread across both the printing plant and the customer with each side ideally achieving cost, time-saving, added-value, efficiency, flexibility, etc., advantages. From the label converter's brand owner customer perspective these benefits can perhaps best be summarised in the following table.

So let's examines some of these key benefits in more detail:

1. **Seamless workflow. A seamless workflow has become one of the essentials of successful digital label production, and this will discussed later in more detail. Suffice to say that it provides the basis for minimizing errors and paperwork, speeds up response times, and provides continually up-dated manufacturing and customer information, as well as bringing down lead times.**

2. **Cost efficiencies. When compared to conventional label printing, the digital process does not make use of printing plates, or have any platemaking materials, chemicals, processes or time requirement, thereby already offering cost-saving efficiencies.**

3. **Production benefits. For the brand owner the opportunity to reduce or eliminate label stockholding, reduce time to market, and improve supply chain efficiencies can be a compelling reason to turn to digital label production. The possibility of having just-in-time production, short-run proofing and test marketing of labels is also of great interest.**

4. **Marketing opportunities. New added-value and marketing opportunities for brand owners – indeed almost any size business – have become a real focus for label users in today's ever-competitive environment. There are many examples today of where digital printing solutions have provided the possibility to easily produce multiple versions or variations, variable design images, personalized labels, mass customization, new promotional opportunities and even regional, seasonal or special event labels. For the digital label producer these marketing opportunities offer the potential to add value and enhance profitability.**

“Digital provides new marketing solutions that add-value and enhance profitability”

5 **Environment and sustainability. There is little doubt that the environment and sustainability have become important issues. By producing exact quantities rather than a percentage of ‘overs’, digital printing can reduce print wastage. Unlike other printing processes there are also no chemicals, water, or plate making materials used with digital printing.**

6 **Brand security. A relatively new, but growing, area for digital design and printing, the latest software solutions mean that digital origination can now incorporate security design backgrounds and special features, variable images, micro text, anti-copy features and much more.**

7 **Track and trace. With every label capable of being different with digital printing it provides printers with the ability to produce sequentially numbered or coded labels, either overt or covert, as well as create hidden codes matched to visible codes, and provide changing codes that can be used with smart phone technology – all offering new possibilities for track and trace label solutions.**

“New solutions for brand protection, security and traceability can be provided with digital printing”

Planning for the investment decision

From the previous pages it should become clear that investing in digital printing technology, with the right decision making process, offers key opportunities to streamline workflow, enhance production capabilities, provide label user customers with new marketing, brand security, and traceability solutions and aids sustainability. More importantly for the label converter, it can make them more efficient and more profitable.

However, before making that important investment decision, there are a number of things that the label converter needs to evaluate and understand.

Firstly, they should review their existing order book. How much short run work is already undertaken that could be more cost-effectively and profitably produced on a digital press? Some smaller label converters have found that up to 60% of their existing jobs could benefit from digital production, so freeing up their conventional press or presses for longer run work. Once installed, the digital press can then already be profitably utilized.

Secondly, how many times has the existing customer base asked for shorter runs, sequential numbering, extended proofs or small test marketing samples? Is there a record of work lost through not being able to supply? Digital will enable such work to now be produced.

Thirdly, with the capability of producing more shorter runs, more versions and variations, personalisation, sequential design changes, sequential coding or numbering, the digital label printer is almost certainly going to be faced with:

- **More time spent in liaison and feedback**
- **More management decisions**
- **More design and colour changes**
- **More colour management**
- **More origination**
- **More complex workflow**
- **More customer liaison.**

Is the business ready for this? Investing in a digital press may often only be the first step in building a successful digital business. Investment may also be required in the pre-press department, in colour management, in a more sophisticated Management Information System (MIS), and in building an integrated and more sophisticated and seamless digital workflow that provides improved production efficiencies, a reduction in errors', faster and more accurate workflow throughput, a quicker response, overall cost and waste reductions, enhanced management information and better customer information.

Put together, one of the key messages that frequently comes across when successful converters talk about their digital printing operations is that 'when you make the transition into digital then you should take the opportunity to stand back and re-think how you do business.'

Undoubtedly, the introduction of digital printing into a conventional label or package printing plant does bring certain challenges, as well as multiple opportunities. In particular, digital printing will have an impact on the way selling takes place, on the need for a different type of marketing approach, on artwork and origination, on pre-press and colour management, on selecting the best conventional or digital process for the job, and on employee acceptance, training and skills.

These areas are all part of the planning, management decision making and investment process prior to investing in digital printing. It's not just about a new press. It's a new process, new skills, new or different methods of working, a new approach to sales and selling. These factors will all be discussed in more detail in the separate Implementation Guide.

While this White paper is primarily concerned with address existing label converters with conventional analogue printing presses that may be looking to invest in digital technology, it is recognised that there may be other print related sectors that have an interest in digital label production to meet specific local, national or niche applications. These include high street commercial printers, stationery manufacturers, mail order companies, marketing operations, in-house printers, and those with sequential text, coding or numbering requirements.

If you fall into any of these other categories and are interested in the potential of digital label printing, then talk to technology suppliers such as Konica Minolta who will be pleased to discuss the market opportunities and solutions.

> "How many existing jobs could be more profitably run on a digital press?"

> "Investing in digital offers the opportunity to re-think the business model"