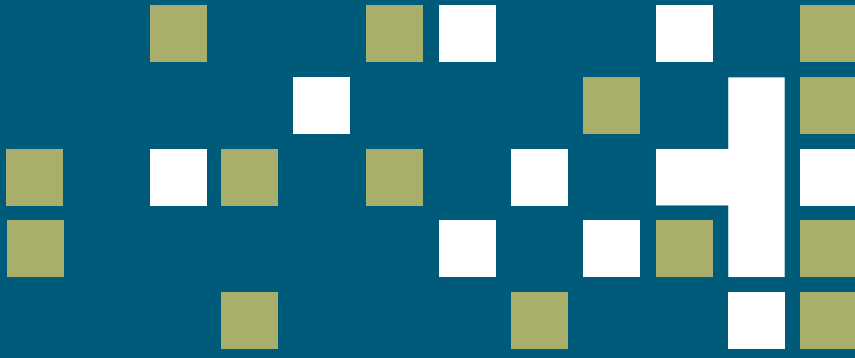




frozentraffic

packaging prepress consultancy

Whitepaper

The four critical pillars to future-proof your packaging prepress/graphics workflow.

*Understanding the current and future
state of the industry by Robert Kohl.*

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Introduction

Four Pillars to Future-Proof Packaging Prepress amidst an AI Revolution

I've spent more than two decades helping label and packaging printers improve efficiency, eliminate waste, and prepare for what's coming next. And make no mistakes, change is coming fast. The global packaging print market is growing, but so are the challenges that come with it: shorter runs, more SKUs, and tighter deadlines than ever before. Yet, artificial intelligence holds out the promise to revolutionize the way we do prepress.

Everywhere I go, I see the same thing: talented prepress and plate-room professionals doing their best to manage increasingly complex workflows with software that was never designed for this level of pressure. They're using disconnected systems, juggling endless artwork variations, and firefighting problems that should have been prevented long before a job hits the press.

I wrote this white paper to help your business build a strong, intelligent foundation for automation because I still see it everywhere – smart, capable people doing their best with tools that belong to another era. And we've reached the limit of what's humanly possible. The AI revolution has rapidly evolved over the past year, quickly becoming a major driver of efficiency across every stage of production.

However, AI cannot work in isolation. It requires the right foundation: clean, connected, and structured data. To “future-proof” a graphics or prepress department, printers must first build the digital infrastructure that AI depends on: databases for one-ups and sheets; for commonality and tool management; and for live production readiness. For AI to deliver true value, your data and workflows must first be standardized, structured, and automated.

The real AI revolution comes in the planning, building out the databases and processes to support it, to eventually feed the AI algorithms.

That's what this white paper is all about, helping you understand how to get there. I'll walk you through the four critical pillars of workflow automation – the building blocks that will make your prepress operation AI-ready. If you start now, you'll reduce downtime, lower costs, and create the kind of data-driven visibility that today's customers expect.

In my opinion, this is no longer optional. The companies that act now will lead the next decade of packaging production. The ones that wait will find themselves buried under a wave of complexity they can no longer control.

A brief background



At 18, I began my entrepreneurial and print-industry career printing books and local magazines in Berlin, Germany, with a friend. During the past 20 years, I was fortunate to work with industry leaders like Agfa, Kodak and Esko. I gained experience in commercial print, IT, and packaging print, while also managing complex automation projects and honing my skills in areas such as colour management and quality-assurance processes.

I've spent most of my adult life in this challenging and wonderful industry as a consultant for large-scale printing operations. Early in my career, I quickly realized that applying best practices in key production processes is essential for future success. So, each day as a workflow consultant, I bring my 20+ years of experience to bear, to help my customers become significantly more efficient, and take cost-cutting through automation and in-shop integration to unprecedented new levels.

Print, especially within the label and packaging print industries, is constantly evolving to more complex levels. For example, today's printers must deal with much shorter runs and more changeovers, more artwork and configuration variations as brand owners want to stand out on the shelf, increased use of eco-friendly substrates as consumers demand more sustainable alternatives, and so on. They also must process a staggering number of orders and keep track of a massive number of printing and flexo plates and other printing 'assets.'

Therefore, I'm laser-focused on understanding how customers work, and what workflow processes they use. I help them with all these issues by establishing standard automation best practices that result in full print-shop integration of all critical workflow processes. Unfortunately, many printers today do not automate or standardize all their production processes, believing that their shop is somehow unique and doesn't require full automation. My experience has been that even though they may be successful now, the mounting costs of using manual processes (or partial automation only) will eventually add up and could financially cripple what used to be a very successful printing business.

In 2017, I combined my technical expertise and passion for efficiency by founding The Grey Elephant – an Industry 4.0 software company that helps increase efficiency and sustainability in the label and packaging print industry. The Grey Elephant helps large and medium-sized label and packaging printers automate all their printing tools/assets and print more packaging and more labels much more profitably.

I'm also CEO of my consultancy firm, Frozentraffic, which helps printing companies configure their order management and workflow systems to streamline and automate processes as much as possible within their graphics/prepress* department. This includes optimizing the prepress process and the ERP/MIS prepress connection – and ultimately integrating all production processes. My focus with both companies has been exclusively on automation and integration through workflow optimization. I've worked on-site in many diverse production environments with owners, managers, engineers, and other production staff to configure complex workflow automation and integration systems, so they're perfectly customized to the unique daily needs and production processes of that specific print shop.

To accomplish this successfully, I've always believed that you must understand label and packaging print workflow best practices inside-out, then standardize and integrate all internal processes, especially in production. That's how I operate. Only then can I automate and meticulously and efficiently track - and quickly and accurately access - all approved artwork, printing plates, and other assets. Only then can I fully discover how to move their designs seamlessly, from planning to graphics/pre-press, to platemaking, and finally to printing. And above all, only then can I 'future-proof' these businesses by bringing them the incredible benefits of automation. For a little more on my personal and professional journey, please go to page 18.

The global packaging print and label print markets continue to grow

According to market research publisher Markets and Markets, the global packaging print market was valued at \$352.1 billion dollars/euros in 2021 and is projected to reach \$433.4 billion dollars/euros, by 2026, growing at a Compound Annual Growth Rate (CAGR) of 4.2% from 2021 to 2026. The market, it said, will be driven by growth in the packaging industry in the form of demand for products with an aesthetic appeal, product differentiation, and technological advancements. In terms of packaging technology, an increase in demand for digital printing will be an opportunity for packaging printing, as the market for digital printing is still growing at a high rate. Also, in terms of application, growth in the food & beverage and personal care & cosmetics industries is expected to propel the market in the coming years.

According to Straits Research, the global print-label market was valued at \$45.1 billion dollars/euros in 2021. It's expected to reach \$65.88 billion dollars/euros by 2030, growing at a Compound Annual Growth Rate (CAGR) of 4.3% during the forecast period. The term 'print label' describes a sheet of material made of metal, cloth, polymer, or paper that is printed and used to display a product's logo, symbols, and published information. It establishes overall brand identity, identifies products, and helps to stop counterfeiting. These labels are directly printed, as opposed to woven labels, and they have several advantages – including precise printing, high quality, and detailed images. Wet-glue, pressure-sensitive, and multi-part tracking labels are just a few of the popular formats for commercially available print labels.

A tsunami is coming – and label, flexible packaging and folding-carton printers are in its direct path

Now while all this market growth is great news, looming on the horizon is a disruptive and destructive force that must be addressed immediately – or it could cripple a printing operation. Current out-of-the box software solutions will simply not be enough to solve these impending problems. To be successful, these businesses need a dedicated expert who will create and deploy standardized, easy-to-use workflow solutions – and have buy-ins from both management and employees alike. They must begin to integrate all their processes NOW – or they will not be able to handle the growing complexities of packaging designs, creative demands of brand managers to differentiate themselves on the shelf, and the daily barrage of ultra-fast turnaround times and deadlines demanded by clients. Variations and versioning of existing artwork will continue to increase, and that increase in throughput will become unmanageable using current methods.

It's already happening. I see it every day: the most dedicated prepress and plate-room employees are tense, frustrated and fatigued as they struggle to process jobs efficiently and meet ultra-tight deadlines – and the situation is not easing! With one hour of press downtime running anywhere from 300 to 800 dollars/euros, depending on what type of press is utilized, one error could cost thousands. In my opinion, companies who do not focus on graphics/prepress automation will not be able to survive in the future. Yes, digital has come a long way in recent years. But packaging can – and MUST – catch up, especially in the crucial area of prepress, which has been ignored for far too long. I estimate that label, packaging, and folding-carton printers have got about 5 years to adapt and make these necessary changes if they want to grow and thrive in the future.

Packaging and label complexities: An opportunity or a nightmare

Let's look at the so-called 'simple' package as an example. We call it simple, but production-wise, it never is. Imagine you print food packaging for a client. The final package comes in 2 different sizes and each package has 3 unique configurations depending on the target market. The text is printed in 3 different languages, one for each country where it's sold. Right out the gate we have 18 different variations of artwork – along with accompanying (common) printing plates. Using today's manual processes, plate-room departments must retrieve the correct printing tool (offset/flexo plates, screens, gravure cylinders, dies, etc.) from a tool archive that often numbers as high as 40,000 to 80,000 plates. It's a challenging, almost impossible task, that has resulted in many costly errors. In addition, press run-times are decreasing, while the number of jobs is increasing. Without automation to trace, track and quickly retrieve these tools and other assets, this job becomes harder to manage.

What's worse is that it may not end there! What if the client, agency, or brand owner decides to use low-migration inks on some of these packages? What if a new substrate or barcode is required? What if regulatory requirements change in certain countries? What if print embellishments are added, such as foil stamping or UV coating? What if SKUs (Stock-Keeping Units) change? Already, we're up to literally hundreds or even thousands of possible combinations of artwork and accompanying printing plates. It's seemingly impossible for even the most experienced and dedicated prepress or plate-room expert to keep track of these assets.

Without standardized automation best practices to trace, track and quickly retrieve these assets, total chaos ensues in the form of missed deadlines, creative errors, eroding profits and, ultimately, lost customers. With cutting-edge print and packaging automation and the constant use of standardized workflow best practices, this problem can be solved. In my opinion, this is the nightmare tsunami headed for the printing industry – especially print, label, and packaging shops. These businesses must act quickly and seize this opportunity.

Why print-shop automation must be standardized

When it comes to prepress/graphics departments, every company is different, and every job has its own peculiarities. However, deploying standard solutions, if packaging best practices are used, will result in current and future success. Here's a very basic example of what I mean. A customer who used to order a year's supply of labels once every 12 months, now orders them in smaller batches 12 times a year. So, your prepress department is doing setup work 12 times a year for the same price as they did for one order once a year. With automation and best practices, the pre-press system could automatically create a gang sheet that would reduce press interruptions and free up employee resources, adding much more value during the actual press run.

Proven benefits of standardized, best-practice workflow automation

Many factors currently impacting the printing industry make automation a key to success now more than ever. First, with a clear shift to shorter runs and more personalized and customized print products, printers now need to process a larger number of unique, smaller orders rather than larger, standardized ones. Second, to compete, printers will need to deliver products faster and lower their manufacturing costs. Finally, businesses will need to fill production roles when it's difficult to find (and keep) qualified employees to do them. Automation solves all these factors. Plus, the increased focus on automation and Artificial Intelligence (AI) is expected to continue advancing the industry, reflecting the need to adopt comprehensive end-to-end workflow and integration solutions that manage output in a cost-effective and timely manner.

Standardized best-practice workflow automation and integration boosts production efficiency, lowers costs, improves print quality, reduces turnaround times and substrate waste, and facilitates faster ordering, reordering, billing, and delivery – to name just a few. It also helps reduce labour-intensive, repetitive tasks such as estimation, file checking, finishing, proofreading, job tracking, etc. Finally, there's the morale factor. Standardized, best-practice workflow automation allows you to do much more with the staff and equipment you already have, invigorate your teams, and reduce employee burnout.

Automation also helps to identify productive and non-productive areas and can provide analytics that give owners and production staff an overview of both efficient and inefficient processes – leading to more informed decision-making that further impacts the bottom line. Many of the top print-automation companies worldwide feature some head-turning case studies on their websites that confirm the advantages of customized in-house automation. The results speak for themselves. More jobs can be managed more accurately without adding new employees, job preparation and job processing times will be reduced significantly, print quality will improve, and so on.

The four critical pillars to future-proof your packaging print workflows

There are four key pillars to building a solid foundation for future-proofing these types of businesses, while dealing effectively with the tsunami of production and creative complexities destined to come. Be aware; if you start off incorrectly and without proper guidance, you'll eventually have to overhaul ALL your workflow systems.

The correct data model is essential

A data model organizes and structures elements of data and standardizes how they relate to other data and to the properties of real-world entities. For instance, a data model may specify that the element representing a printed piece be composed of several other elements originating from other sources (in addition to the piece's size, shape, colours, inks, and so on). Data modelling is extremely important as a starting point. Get it wrong and your automation will be limited – perhaps not at the beginning but afterwards, as printing tasks become much more complicated (for example, printing multilayer, printing gang sheets, printing multilayer on gang sheets, etc.).

Pillar No. 1: **Customer Data/Pre-Production Data**

This is the one pillar that's beyond your control because information (job input details) comes from outside sources (the client, agency or elsewhere). How does this pillar work? Customer data/pre-production data and its corresponding metadata, whether original or revised information (such as customer job/part number, number of colours, barcodes, etc.), that is sent to your prepress/graphics department must be 'managed' through software. This should be done on its own, totally separate from your ERP (Enterprise Resource Planning) system. By 'managed' I mean that every single detail of the order is available at the click of a mouse and can be instantly tracked, traced, and accessed.

This can be especially challenging because, as mentioned above, this essential data can arrive multiple times from various sources – including the brand owner, his or her advertising agency, an in-house marketing department, or even the sales department. Therefore, it's absolutely crucial that the correct information be verified and 'managed' accordingly.

Most importantly, this information must be put in a form (modelled) that flows seamlessly to the next stage (The Prepress/Graphics Order), so it can be quickly 'converted' into ready-to-print files (PDFs). Lastly, you need to manage every bit of incoming customer data – even data you currently don't use. This is because you may need it for future orders, or to record the history of an order in detail, or to fully understand how much customer/pre-production data is required to create the final, approved production file.

Pillar No. 2: **The Prepress/Graphics Order**

The goal here is to convert that customer data into approved, ready-to-print files, often called ‘one-ups.’ These files must include all necessary printing information such as size, colours, crops, die lines, etc., as well as all necessary data regarding the press setup and commonalities. We also need to include metadata, such as customer name, job name, approval status, approval given by whom and when, etc., as well as any other information necessary for production and delivery of the final printed product. This is the ‘black belt’ of the prepress/graphics department – because now these hard-working specialists are carefully processing these files to ensure that everything is 100% press-ready. This crucial pillar is the only opportunity for the prepress/graphics department to add true value to the project. However, it forms the necessary foundation for all the other important work that follows.

Pillar No. 3: The Sheet Order

The sheet order is the process where printers step and repeat their one-ups. Step and Repeat (S&R) simply refer to the process of creating a layout where images are repeated multiple times. The S&R file is the basis for platemaking which leads to Pillar No. 4: The Press Run. The planning department defines the S&R layout, and the prepress/graphics department puts it into place. If this process is automated, the planning department can be as creative as it wants to be – without placing additional pressure on prepress staff. Plus, automation can also ‘future-proof’ the process. For example, Artificial Intelligence (AI) can create the sheet based on order intake, commonalities, cost efficiency, and so on. Also remember that a sheet order is not necessarily a one-to-one process – so a ‘one-up’ may not always be equal to one individual sheet. It can be confounding.

In fact, many printers today, to reduce on-press change-over times and promote sustainability, utilize ‘gang printing’, which involves printing multiple images, or one-ups, over a sheet area – then finishing (cutting) these images to get the final printed product. Or maybe, because a smaller-sized substrate is being used, the sheet needs to be reduced from perhaps four lanes to two lanes to print the job – which means a new ‘step and repeat.’ Most importantly, this adds to the complexity of each job. In any of these scenarios, following standardized automation workflow best practices should be your final goal.

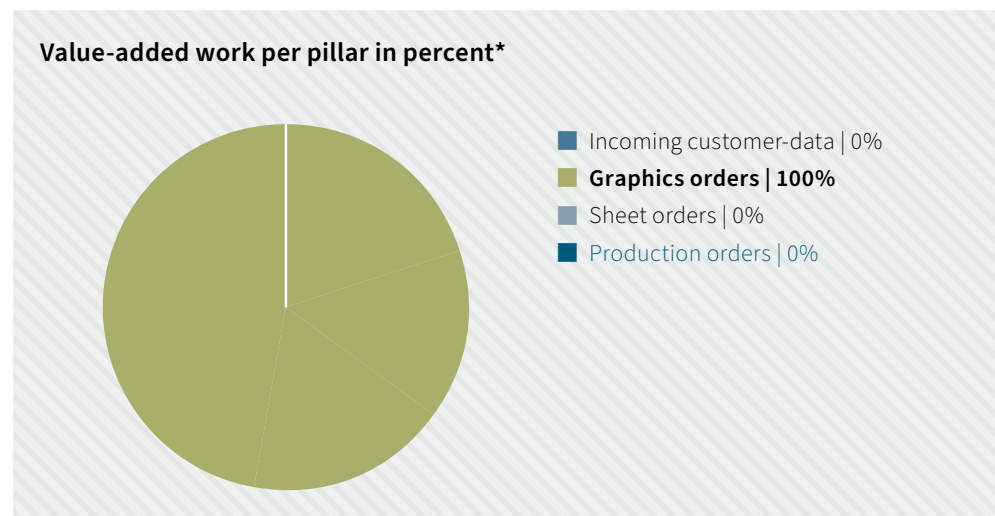
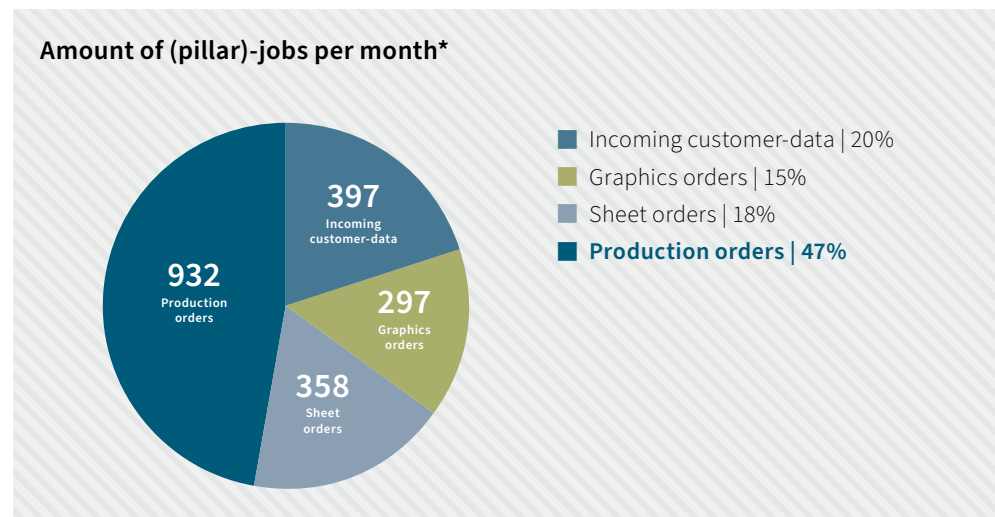
The bottom line here is that fully automating the entire sheet order process will save hours and hours of setup time, while reducing costly errors. Ask yourself, how do you know what you can combine efficiently on a gang sheet if you don’t have the proper data model? The fact is you don’t. Automating your data and processes allows you to create the sheets as they’re needed, without human intervention. If a graphics/prepress staffer must create the gang sheet, any on-press time savings will be offset because of the additional manual work that the prepress employee had to do – and if you’re not doing this now, rest assured that your competitors are, or will in the future.

Pillar No. 4: **The Press Run**

For the final press run, you're basically taking the sheet from the previous pillar, putting it into the form of printing plates, and then putting it onto the press. To optimize the workflow, each run should have its own unique order and corresponding identification number before assigning plates to it, while making sure that all the necessary printing tools are deployed. A printing 'tool' includes anything used to print a project – such as flexo and offset plates, screens, gravure cylinders, embossing plates, dies, digital print files, and so on.

Here's why it's crucial to give each, individual run its own unique identification number before assigning plates to it. It's not uncommon for a printer to have a production order with multiple sheets on press. Let's say they're combining five different sheets for a press run. The job goes to the press, but staffers are combining it under one identification number instead of five individual ID numbers. This becomes confusing and problematic, because how do you sort these plates properly? If you put the multiple-sheet order under one identification number, how do you know if the second sheet goes before the first one, or if the fifth sheet goes first? If you give each single sheet/plate a unique identification number, you can keep proper track of them.

Pillar ratio



* Reference customer | Label printer: 10 presses, HPC & Beverages, Team of 4 in Graphics

Above is an example of the 4 Pillars process for a typical label printer with 10 presses and a production team of 4 full-time employees (FTEs). It shows the collective workload of the entire graphics and prepress department teams – which will handle 390 incoming customer-data, 310 graphics orders, 365 sheet orders and 934 production orders, while these jobs are going to increase greatly over time. Notice how the graphics order process only adds 15% to the overall value of an average job, despite being the where 100% of the value-added work is done? If everything is done manually, as the number of jobs skyrocket, the time-saving advantages of gang-sheet imposition deployed at the sheet-order stage will decrease exponentially.

If you don't automate all these key processes, especially the sheet order, they'll erode your profit margins substantially each and every day, and the negative effects will accumulate over time, eventually crippling your business.

Future-proofing your business

In my opinion, your success comes down to crystal clear communication between prepress employees, plate-room staff, and press operators. Enabling production teams to quickly trace, track and access all their printing assets, while communicating in the most efficient way, automation places the printer in total control of all print assets and production processes. With access to key analytics, owners can make decisions based on actual data; and with recent advances in AI (Artificial Intelligence), the entire process of customized automation and integration is even more streamlined and helpful. Remember, downtime on a packaging press can cost thousands of dollars/euros, so there's no room for error.

Finally, here's something you don't want to hear, but should seriously consider. This transition to workflow standardization through automation best practices cannot be done in individual steps. It must be done as part of the overall goal of 'structuralizing' all your data and be tied seamlessly to automating all your internal workflow systems. If you automate now, you'll gain immediate efficiencies and never-before-realized cost savings. Most importantly, you'll also be ready for the inevitable tsunami of complex orders, ultra-tight deadlines, and daily client demands that I'm certain will be commonplace in the years to come – especially for label and packaging print companies. It's already happening.

The old cliché still rings true: “The future is now!”

Some benefits of adopting workflow automation best practices

The cost savings driven by standardized workflow automation best practices can be used to hire new employees, invest in new equipment, boost your sales and marketing efforts, and more. From cost savings to customer satisfaction there are many other 'hidden' benefits to automating all your critical in-shop production processes. They often vary, depending on your unique production environment, what you need now, and where you want to be in the future, and can include:

- Faster processing of more small-run orders via reduced prepress setup times.
- Reduction of human touchpoints and therefore decreases in costly errors.
- Processing of many more jobs without adding additional employees.
- Faster, more efficient plate tracing, tracking, retrieval, and on-press changeovers.
- Much faster turnaround times for faster delivery to your customers.
- Improved customer satisfaction via faster, more accurate inputting and job processing.
- Less substrate waste by automating and maximizing imposition.
- Analytics' collection to help owners better identify inefficient areas and processes.
- Cost savings by reducing repetitive tasks that waste employee time.
- Maintaining compliance with regulatory standards by overseeing all processes.
- Increased employee morale and retention as they become much more efficient.
- More accurate production data because information is handled in a standardized way.

About the Frozentraffic team

Led by CEO Robert Kohl, the Frozentraffic team is a small group of dedicated printing industry professionals with over 50 years of combined, hands-on experience in prepress, workflow automation, integration, and deployment. Its members have worked for major printing industry suppliers, the world's leading OEMs (Original Equipment Manufacturers) and other established companies. They not only support the four key pillars of the Frozentraffic platform, but have become trusted advisors to clients around the globe when it comes to ongoing technical support and guidance. They can also, if needed design new ways of implementing workflow automation systems specific to the unique needs of any client's prepress department. Their solutions have helped printing businesses worldwide become much more efficient, reduce waste and costly errors, and increase profitability – all with the goal of 'future-proofing' their business.

How I became a graphics workflow evangelist

The journey to where I am today has been a fascinating odyssey. As a student, I wanted to be a journalist. I wanted to write to inform, move and inspire people. So, I started writing for my school newspaper. I wrote a few articles that were ok. But it wasn't easy for me. I struggled and sweated to be just 'ok'. Fortunately, I had a friend that also worked on the newspaper who was also a writer. I watched him work and I read his articles. They were excellent. He wasn't struggling, he wasn't sweating, and his words flowed like honey. Let's just say that I knew, at that moment, that journalism really wasn't for me!

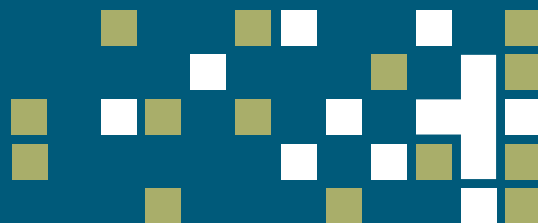
But I didn't give up on publishing. Instead, we started a publishing business. He wrote and I printed – and we were a good team! We published 3 books and toured local libraries and coffee shops. We also won an award for young entrepreneurs. Today, many years later, I'm still passionate about printing. But now, instead of small runs of books, magazines, and school newspapers, I help packaging and label printers save money, time, and materials. The lesson I've learned is that sometimes you must let go of one dream to find a better dream. I'm sure every successful business owner reading this is happy that a previous 'dream' they had when they were young, didn't work out. So, they discovered a new dream. The path to success is often difficult to navigate. But with passion and commitment, those bumps and detours along the way will make you even more determined than ever to succeed.

I bring this same mindset to my clients as CEO of Frozentraffic, my prepress automation consultancy, where I partner with them and become fully invested in their success. I want to see my clients succeed and identify what they need in terms of automation to prosper now and in the future. I want to understand the needs and goals of print-business owners and employees alike – and ultimately make automation and integration best practices a foundational pillar of their corporate culture.

Before you do anything, let's talk

Make no mistake, a tsunami of complexity is looming on the horizon that can cripple packaging and label printers worldwide if they don't automate their processes now. And as I mentioned previously, I already see this trend happening in real time. Much like seeing the tip of a very large iceberg, we all know painfully well it's what's below the water that will ultimately destroy us. Finally, I believe that my years of experience and knowledge in creating, standardizing, and installing workflow systems, can help the owners of print shops thrive in the future. As a consultant, I'm eager to prove it again – by helping print, label, packaging print and folding-carton printing companies become much more efficient and ultimately, much more profitable.

Frozentraffic helps companies configure their order management and workflow systems for the specific needs of their prepress departments. Let us develop a plan for you right now. With a comprehensive Frozentraffic Automation Audit, we can show you where you are in terms of workflow now, and where you could be several years from now. The team is just a phone call away and looking forward to hearing from you.



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For more information and an assessment of what your prepress/graphics department needs are now, and will be in the future, e-mail me at frozen@frozentraffic.com.
www.frozentraffic.com