

Connected
automation



how to make

print production



more valuable



and scalable

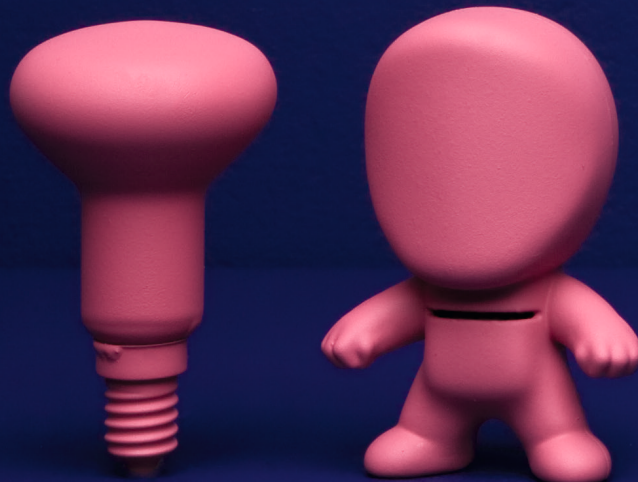


Table of contents

Introduction	4
Why this white paper?	4
Restoring growth through scalability	5
1. What is Connected Automation?	6
1.1. Definition and Objectives	6
1.2. How does it work?	7
1.3. Connected Automation for 360° customer vision	9
2. (Re)Creating value	10
2.1. Adopt a comprehensive approach to the customer journey	11
2.1.1. Mapping customer and order processes	11
2.1.2. Measuring processing times	14
2.1.3. Identifying points of value leakage	14
2.1.4. Determining areas for improvement	14
2.1.5. Building key differentiators	15
2.1.6. Refocusing teams on high-value tasks	16
3. Web-to-print myths and the importance of Connected Automation	17
3.1. Web-to-print, an unforgiving world	17
3.2. Connected automation at the heart of web-to-print success	18
4. Securing your print business	18
4.1. Expanding your sales channels	18
4.2. Leveraging Connected Automation to broaden your customer reach	20
4.3. Building lasting customer relationships	20
4.3.1. Adapting to changing B2B buyer expectations	20
4.3.2. Strengthening customer retention in B2C markets	21
4.4. Adapting to market shifts in real time	21
4.5. Harnessing your strengths amid market consolidation	22
4.6. Reducing IT vendor dependence	23
5. Scalability is the key to success	25
Case studies	26
Solopress: Journey to Success Through Connected Automation with Four Pees	27
Altorffer and Four Pees: A Successful Implementation of Connected Automation	31
6. Connected Automation	27
6.1. Practical examples	35
6.2. Essential steps for implementing Connected Automation successfully	38
7. Final thoughts	39



Introduction

Why this white paper?

The motivation for this white paper stems from a clear observation: regardless of the country, printers are consistently caught between the rising costs of raw materials and energy on one side and the continuous pressure of lowering prices on the other. This issue has been further amplified by the increasing trend of purchasing print products online. At the same time, with a structural industry wide overcapacity, the rise of the platform economy and demand for highly personalised products represent an opportunity for all verticals within print industry.

The rapid growth of e-commerce, market places and platforms, has accelerated the digitization of procurement processes, especially in the B2B sector. **Buyers now expect the convenience of placing orders online, comparing prices effortlessly, and sourcing the most affordable suppliers.** They also expect instant feedback on the status of their orders. The supply chain disruptions that affected the printing industry in 2021 only worsened profit margin reductions, particularly for printers operating under long-term contracts who had not accounted for rising paper, packaging, and ink costs in their pricing models.

Although lockdowns temporarily reinforced the importance of local suppliers and shorter distribution networks, the reality is that once things returned to normal, price again became the most decisive factor in purchasing decisions. Moreover, the growing competition from international print providers has only made things more difficult for local printers., not being restricted to a city, a country/state but more a continent.

Faced with this situation, **many traditional printing companies turned to web-to-print as a potential savior**, often supported by government financial aid during the pandemic. Print service providers have also, often somewhat opportunisticly, jumped on the growing presence and success of the earlier mentioned market places and platforms. However, in many cases, **these initiatives lacked a comprehensive strategy or vision**, specifically neglecting the different user experience requirements, **leading to isolated and disconnected sales channels.** Many decision-makers were influenced by consultants or agencies that emphasized the visible elements - such as front-end interfaces and marketing campaigns - while neglecting essential factors like automation, customer retention, and margin optimization. In numerous cases, this oversight has had detrimental consequences.

Our analysis goes beyond sales tactics and also considers the structure of information systems in print shops. Through our collaboration with businesses of various sizes and locations, we have observed that many still rely on fragmented software ecosystems, a legacy of outdated monolithic architectures from the 1990s. The impact of this is considerable: valuable customer data remains underutilized, operators repeatedly enter the same information into different systems, time is wasted, and business expansion is constrained. For sales teams, these outdated systems mean they lack a complete and unified view of customer interactions, as data is scattered across multiple disconnected platforms.

Another growing concern is the human factor. Similar to other industries, **printing companies are struggling to recruit skilled professionals** to replace experienced employees who are retiring, as well as to attract talent with the digital expertise required for modern printing and e-commerce. Additionally, the printing sector is not perceived as particularly appealing to younger generations. These recruitment challenges can restrict a company's growth, even when new business opportunities are present.

At present, **numerous printers find themselves stuck in a difficult situation**: caught in aggressive price competition, dealing with escalating raw material costs, operating web-to-print platforms that fail to generate sufficient margins, and hindered by rigid information systems that prevent progress. Many managers are searching for a way to break free from this cycle.

However, there is a path forward - one that creates value, alleviates recruitment difficulties, enhances web-to-print profitability, and drives business growth. That solution is connected automation.

Restoring growth through scalability

With this white paper, we aim to provide valuable insights that can help develop your business. In the startup ecosystem, the term "scalability" is frequently used to describe a critical factor in a project's success. The ability to build structures that foster and sustain substantial growth is fundamental for ensuring long-term progress.

Scalability is not exclusive to startups - it can also be applied to industries such as printing.

The process begins by examining the customer journey in its entirety, mapping out their multi-channel and multi-modal purchasing behaviors. Understanding these patterns highlights the necessity of opening up information systems to enable seamless communication, integration, and interaction.

Through real-world examples drawn from years of hands-on experience and industry projects, we will illustrate **how to pinpoint opportunities for development and adapt your organization efficiently to foster growth using connected automation.**

Ultimately, this approach is about regaining control, restoring competitiveness, driving business expansion, and shifting from a reactive state to one of proactive and strategic growth.

In short, it's about moving beyond the struggle and embracing a future filled with potential and positive momentum.



Tom Peire,
CEO FourPees

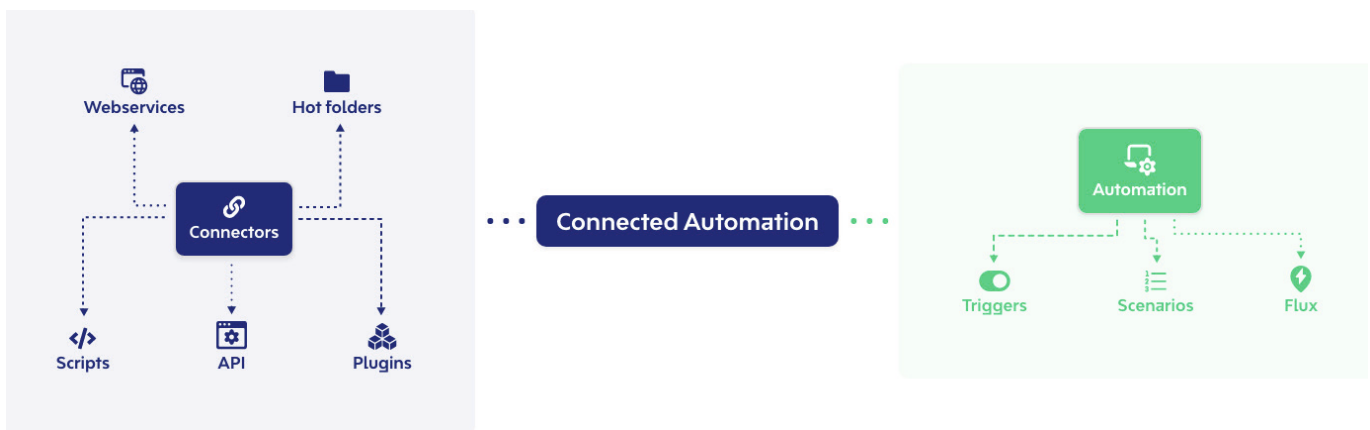


1. What is Connected Automation?

1.1. Definition and Objectives

Connected automation is both a strategic approach and a technological process aimed at optimizing business workflows and information systems. More than just a tool, it represents a mindset that seeks efficiency across all operations. At its core, connected automation relies on two essential elements:

- 1. Connectors** – These function like USB ports, enabling different software applications to interact seamlessly, even if they were previously unable to communicate.
- 2. Automated Workflows** – These are structured sequences of actions that occur automatically, triggered by specific events, predefined conditions, or data inputs, eliminating the need for manual intervention.



As highlighted in the introduction, the printing industry, much like other sectors, has traditionally relied on information systems that consist of separate, unintegrated software components. These silos exist due to technological constraints, publisher-driven software design choices, or simply a lack of system optimization. This fragmented architecture results in operational inefficiencies. Connected automation is designed to break down these barriers, enabling smooth information exchange and integration in order to:

- **Eliminate repetitive data entry** across multiple systems.
- **Minimize information loss** between different software components.
- **Consolidate data from diverse sources** to improve decision-making and business intelligence.
- **Extend the print shop's information ecosystem** to integrate with suppliers, customers, and other external partners, fostering a more interconnected and streamlined operation.



Connected automation is not limited to prepress workflows or a single software platform.

Some software vendors mistakenly promote automation as being restricted to job processing workflows within a print shop, but the reality is far broader.

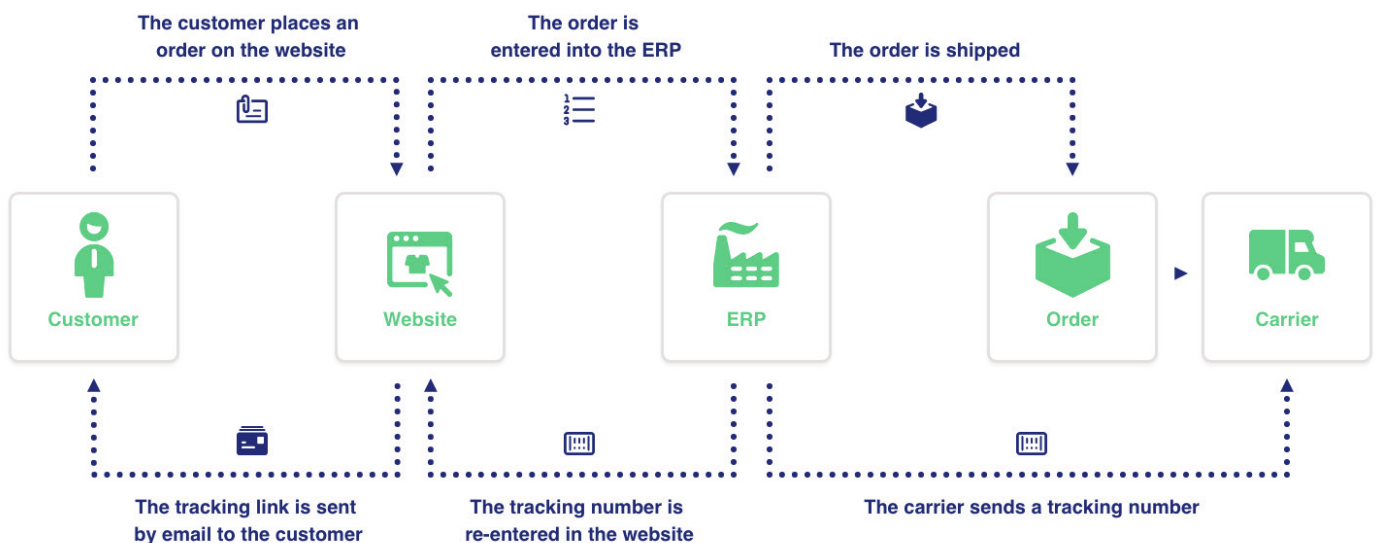
Connected automation is a comprehensive framework applicable across all functions of a company. It is designed to work universally across different software environments, using a variety of automation scripts and connectors that can be implemented in countless ways to suit individual business needs.

1.2. How does it work?

To better illustrate how connected automation operates and the advantages it offers, let's look at a practical example: receiving a package tracking link after placing an online order.

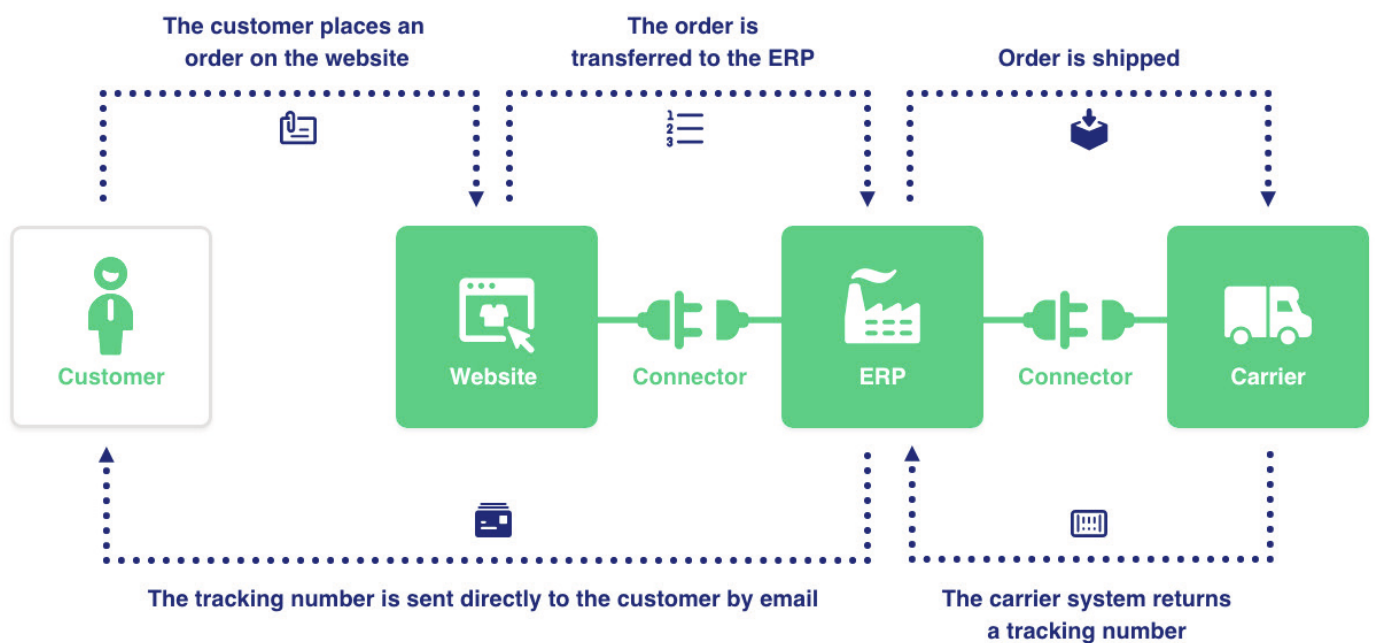
In a traditional, disconnected system, three separate software components are involved:

1. The eCommerce platform where the customer places and pays for the order.
2. The ERP system that manages production, procurement, and shipping.
3. The logistics provider's system that handles the shipment and delivery of the order.



Without automation, these systems do not communicate seamlessly. Employees must manually copy order details from the eCommerce platform into the ERP, print shipping labels, and later enter the tracking number received from the carrier back into both the ERP and the website to inform the customer.

With connected automation, these inefficiencies are eliminated. Connectors link the website, ERP, and carrier system, forming a continuous flow of information. Scripts are deployed to transfer order data automatically from the eCommerce platform to the ERP, and then from the ERP to the logistics provider's system. When the carrier assigns a tracking number, it is automatically sent to the ERP, triggering an email to the customer with the tracking link and updating the order records in both the ERP and the eCommerce platform.



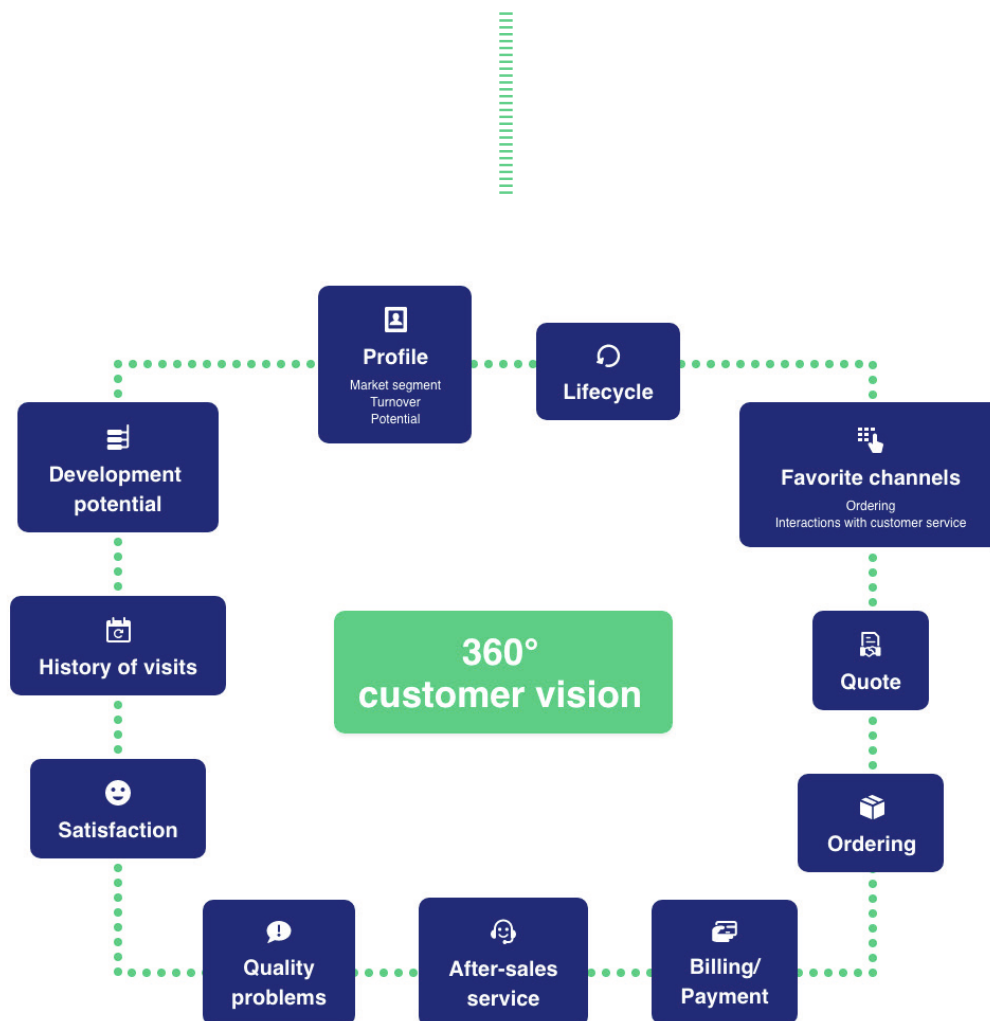
By implementing connected automation, these operations are executed instantly and without manual intervention. If an issue arises - such as a failed email notification - alerts can be set up to notify a supervisor, ensuring a smooth and reliable process.

This example demonstrates the primary benefits of connected automation: reducing manual input, saving time, increasing reliability, and consolidating data across systems.

1.3. Connected Automation for 360° customer vision

If a printing business operates through a single sales channel - such as a dedicated sales team - managing information is relatively straightforward. All data remains centralized and accessible to relevant personnel. However, once the company expands into multiple sales channels - by incorporating an eCommerce platform alongside its sales force, for instance - complexities arise. **When systems remain in isolated silos, data becomes fragmented, preventing synchronization.** Sales occurring via the eCommerce platform are not linked to those made by the sales team, which means a sales representative may only see a fraction of a customer's purchasing history and revenue contribution, missing out on insights from online transactions. On the customer's end, the same issue occurs: they may have two separate accounts for dealing with the same supplier, one for traditional purchasing and another for online transactions.

Connected automation resolves these limitations by integrating modules and automating data synchronization, ensuring that both customers and sales representatives have a complete, unified view of their transactions and interactions, regardless of the sales channel. This concept, known as **360° customer vision**, is becoming increasingly vital in today's intricate and evolving marketplace.



2. (Re)Creating value

Printers find themselves caught in a difficult position, facing rising raw material expenses on one side and relentless price competition on the other. In response, they are exploring every possible avenue to generate value and safeguard their profit margins. However, when increasing prices is not an option without risking customer loss, the outlook appears grim.

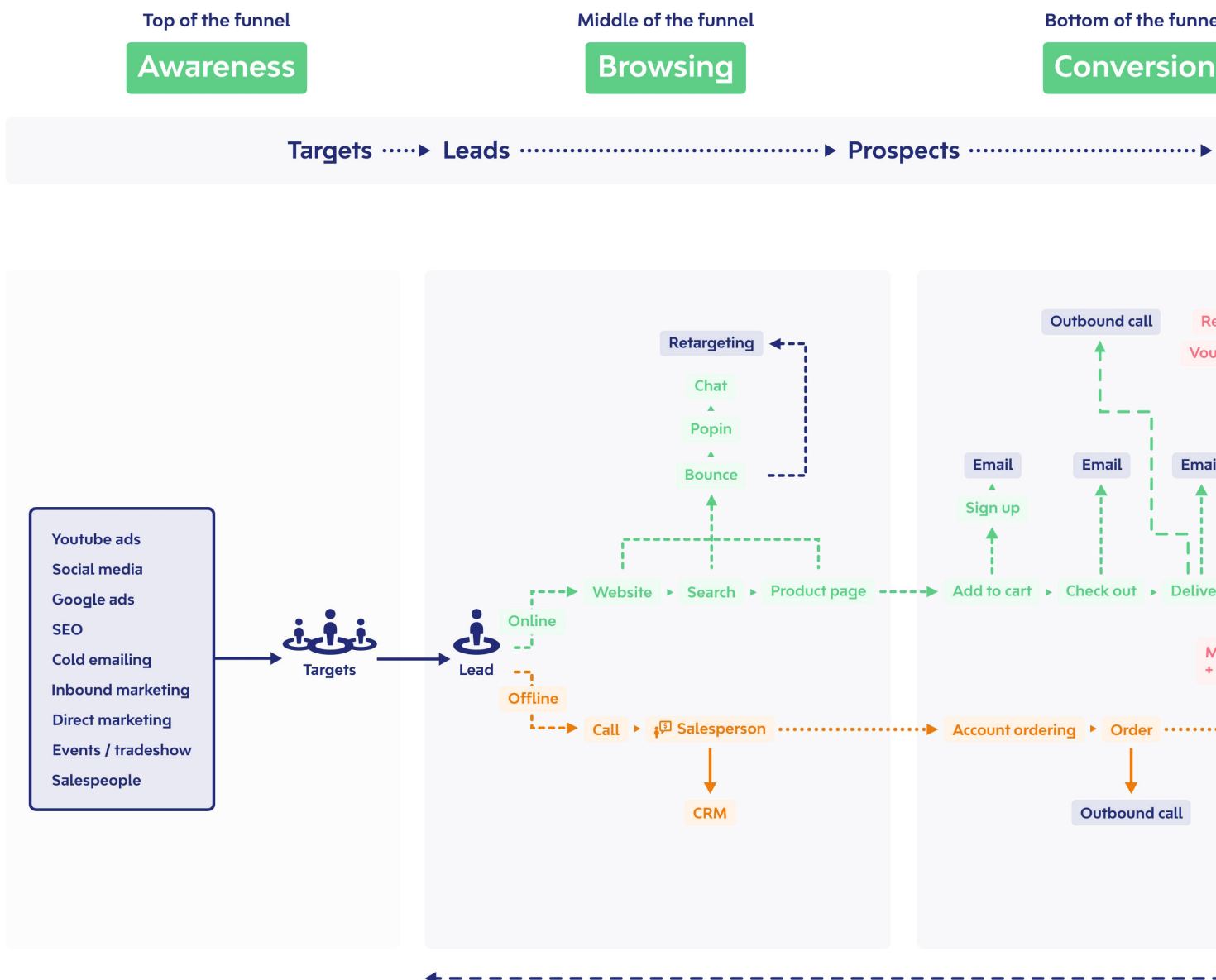
Even in such a challenging environment, there are ways to rebuild value and restore margins while maintaining a competitive edge in the marketplace. One effective approach is to optimize the use of existing staff - whose wages remain a fixed cost - by eliminating redundant

tasks and reallocating them to more strategic, high-value activities. Additionally, enhancing profitability can be achieved by minimizing errors at each stage of the production process, an aspect that is too often overlooked in print operations. Lastly, offering clients supplementary services at no extra cost can be a crucial differentiator in standing out from the competition.

Maximizing resources, emphasizing high-value tasks, elevating quality, and expanding service offerings - these are just a few of the advantages that connected automation can deliver to your printing business.

Let's explore these essential benefits in more detail.

User flow



2.1. Adopt a comprehensive approach to the customer journey

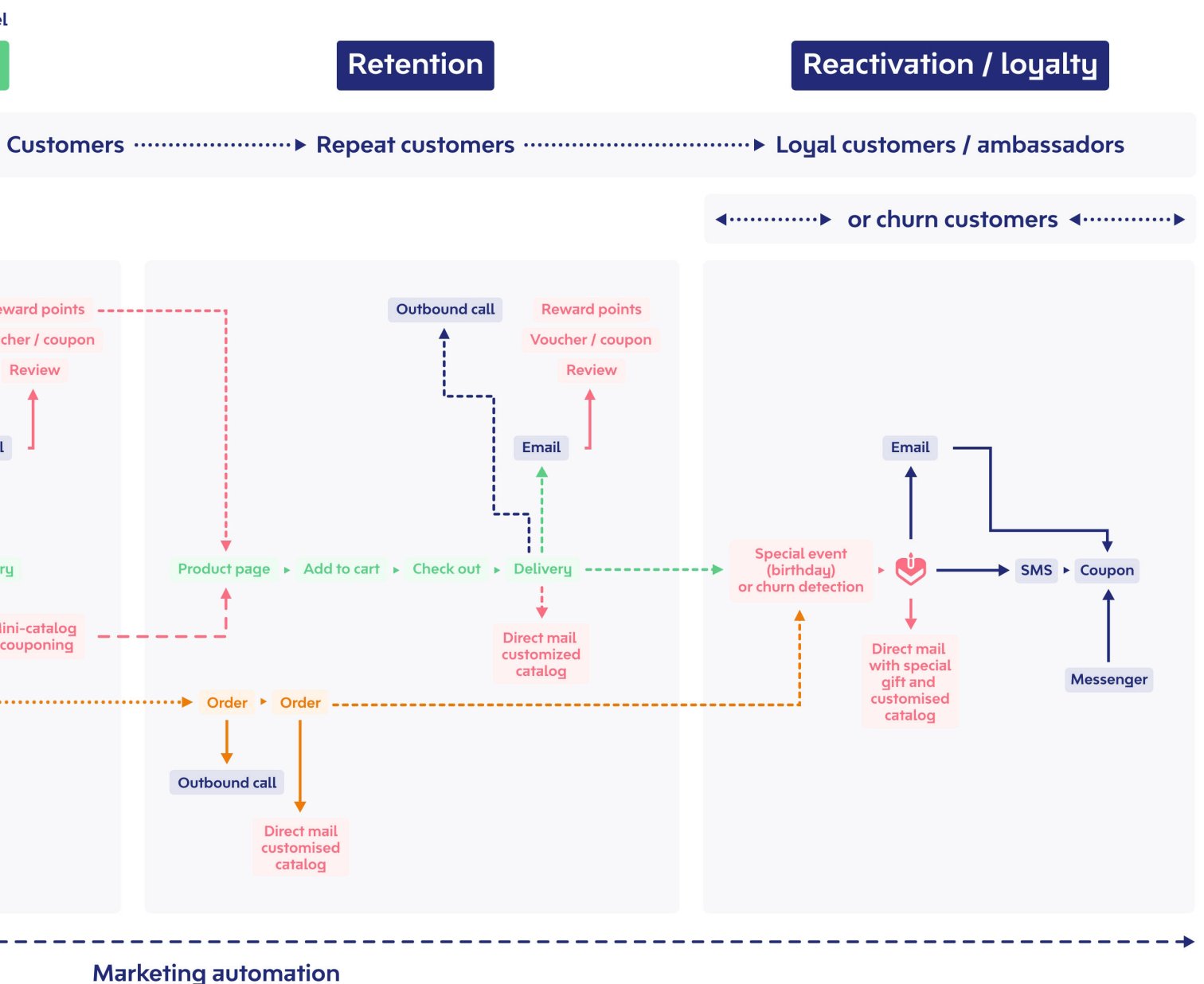
2.1.1. Mapping customer and order processes

The initial step is to map out the entire workflow from beginning to end, for both the customer and the order (as they are distinct). Contrary to common belief, workflow isn't just about handling prepress files. It involves examining the full customer experience - from the first interaction to invoicing - while taking into account all possible ordering methods.

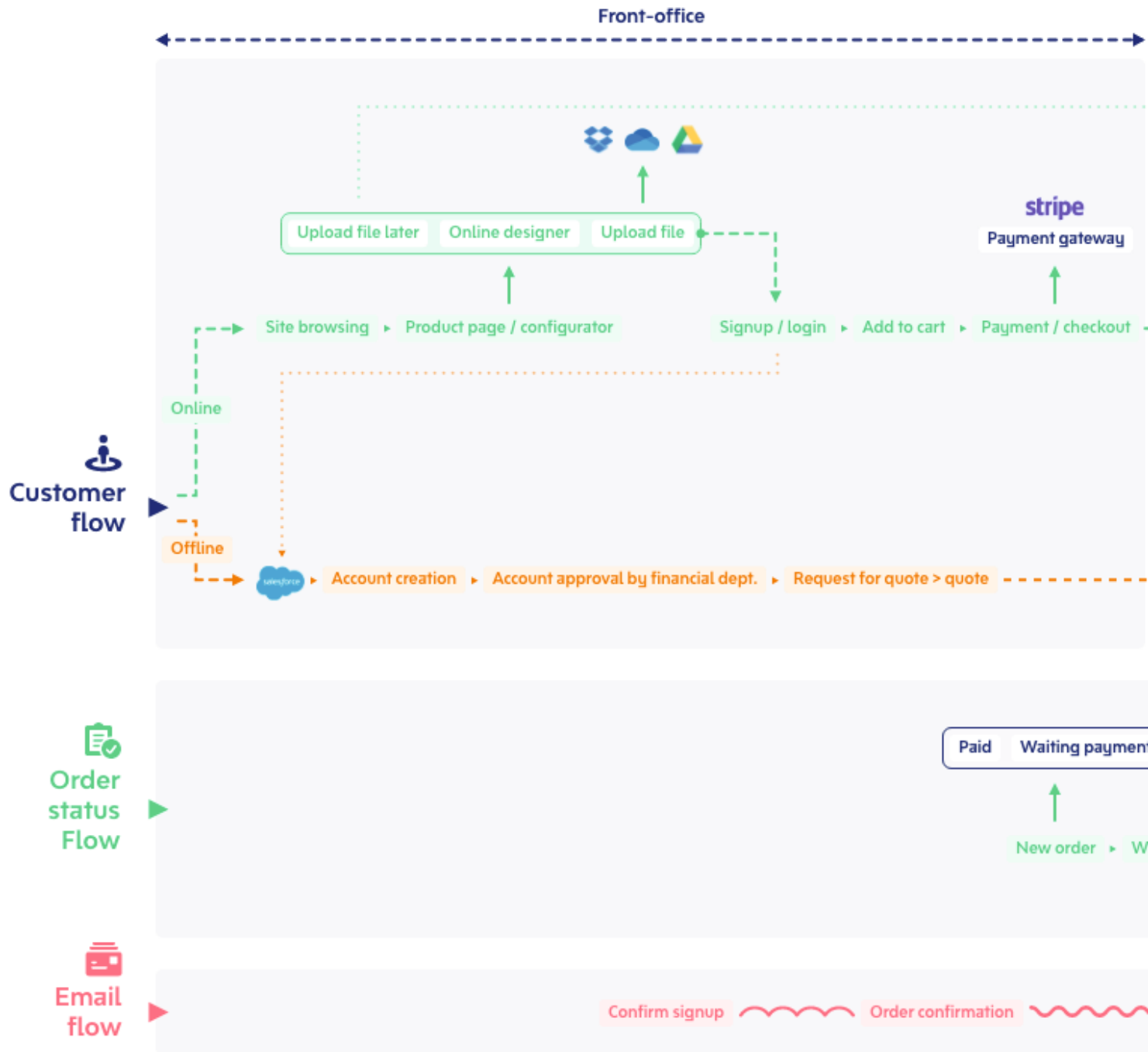
In practical terms, customer and order flow diagrams outline each stage involved in processing a customer and their order: account creation, quoting, file

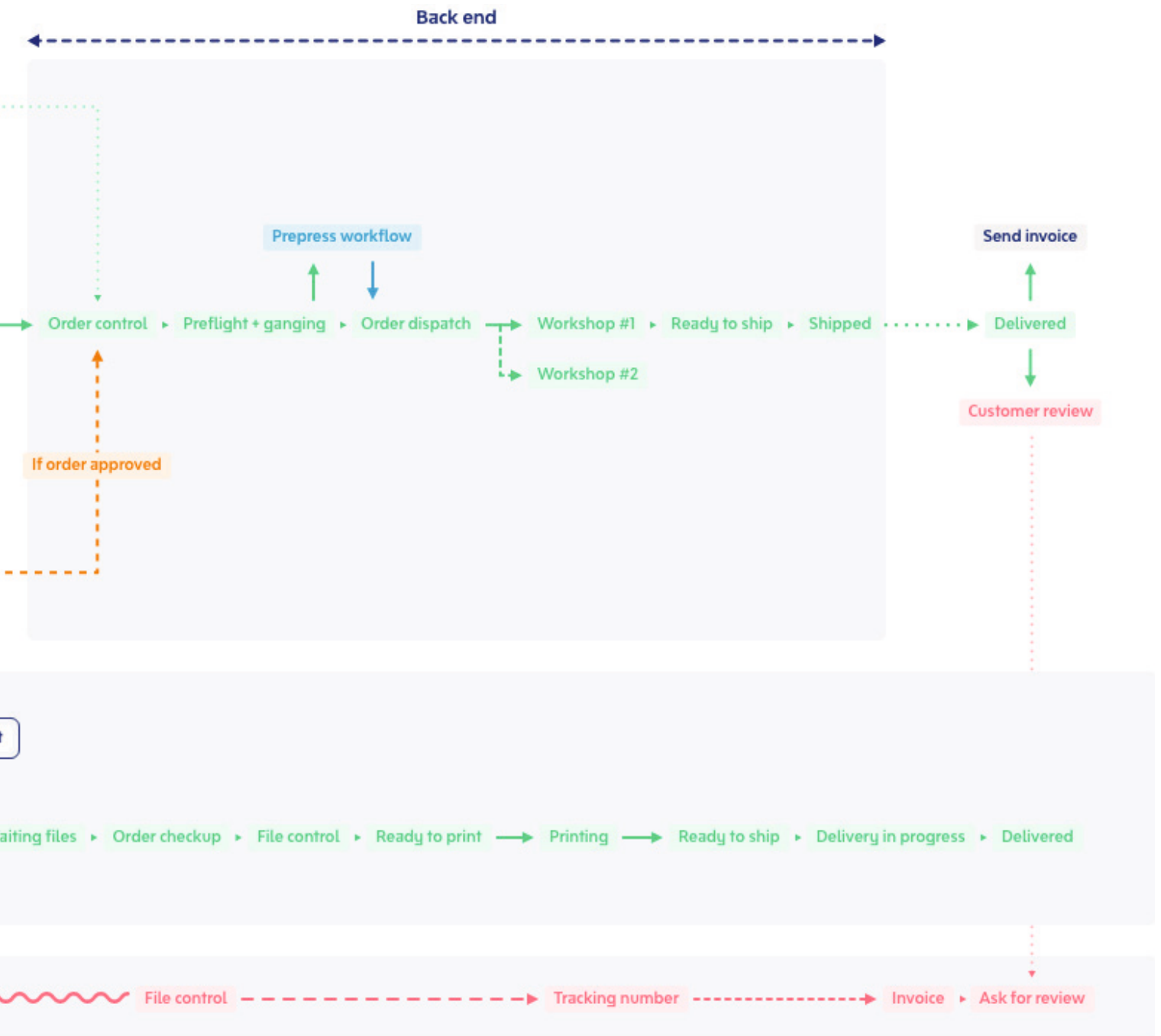
submission, validation, production, shipment, and invoicing. It's crucial to be as detailed as possible, documenting every action performed across different tools. This mapping will expose redundant, tedious tasks that have become habitual without ever being questioned.

These diagrams will also uncover inefficiencies or pain points that frustrate customers or internal teams due to unnecessary complexity. They will highlight sources of errors that could significantly impact the final quality of production.



Order flow







2.1.2. Measuring processing times

By analyzing the customer journey, you can pinpoint problematic areas in your workflow. To validate these concerns, you need to measure key performance indicators in real-world operations, such as the time required to complete specific tasks, the number of back-and-forth interactions, and the number of clicks an operator must make. These measurement indicators will be crucial for making future improvements.

2.1.3. Identifying points of value leakage

With the customer journey diagram and gathered measurements, you will gain a clear view of where your business is unnecessarily losing value - much like a plumbing system with leaks. Whether due to overly complicated processes, software inconsistencies, or ingrained habits, inefficiencies are costing your company money. The good news is that once these pain points are identified, they can be addressed and eliminated.

2.1.4. Determining areas for improvement

After pinpointing the inefficiencies, you can develop a targeted action plan with your integrator to resolve them. Connected automation will act as a solution, sealing these leaks and helping you reclaim value by improving productivity and reducing errors across your teams.

A concrete example: handling material supply disruptions

Several months ago, printing companies were facing severe challenges due to paper shortages, as suppliers frequently introduced delays, modified part numbers, and implemented price increases on a weekly basis. Let's picture a "traditional" print business where the purchasing manager was left to handle these unexpected changes alone. Whenever a product became unavailable, he had to notify the entire sales team through email, remove the product from the catalog, and issue alerts to customers with active orders so they could either choose an alternative or opt for a cancellation. This enormous responsibility naturally resulted in errors and missed notifications. The consequence? Potentially unhappy clients, who might submit quality complaints, demand compensation, or withdraw their orders altogether.

Thanks to the connected automation approach, various elements of the information system have been integrated to ensure that the moment a supplier removes a material from availability, the following actions occur automatically:

- All sales personnel receive real-time updates
- The affected products are instantly disabled in both the ERP system and the website, preventing further purchases
- Customers with active orders for the unavailable material receive immediate notifications; their respective account managers are automatically assigned a follow-up task in their daily agenda to propose an alternative solution or process the order cancellation

This innovation has allowed the printing company to respond more swiftly in an unpredictable market, eased the burden on suppliers, and significantly lowered costs related to non-compliance and post-sales support.

2.1.5. Building key differentiators

Connected automation is not just about addressing inefficiencies in workflows. When used strategically, it can provide your business with unique advantages that set you apart from competitors.

To achieve this, instead of merely identifying inefficiencies in the customer journey, focus on friction points - areas where the customer experience is lacking, either with your company or your competitors. Through connected automation, you can specifically target these pain points to streamline the customer experience and save them valuable time.

Two concrete examples: Simplifying file submission and streamlining orders

Example 1: Simplifying file submission.

For print customers, sending files can be a complicated process, especially when the person submitting the files is not the graphic designer. Some customers send files via email, others use transfer services that may not support all file formats, and some prefer dedicated platforms like WeTransfer. With the expertise of the Four Pees team, a centralized drop zone was created for a print shop's customers. Through a simple web interface, customers can select their preferred method: upload directly from their computer, connect their cloud storage services like Dropbox or OneDrive, or paste a WeTransfer link, with automation handling the retrieval process. By integrating cloud services and automating file transfers, we simplified the process for customers and saved valuable time - an excellent way to foster long-term loyalty!

Example 2: Streamlining reorders.

Some sectors of the printing industry experience seasonal demand, leading to recurring orders each year. This can be problematic for customers, as they may have misplaced their files or be unsure of which version was used for printing. By securely storing customer files and providing a web-based interface for easy reordering, printers can offer a premium service. Knowing that their files are safely stored and can be reordered within seconds, customers are less likely to switch to a competitor, even if they find a lower price elsewhere. Offering a service that directly addresses customer pain points is one of the greatest advantages of connected automation.

2.1.6. Refocusing teams on high-value tasks

As discussed earlier, analyzing the customer journey helps identify inefficiencies and friction points. Once these have been addressed, employees save valuable time as automation handles tedious, repetitive tasks. But what should be done with this newly available time? A smart approach is to reinvest this resource into new services that can be leveraged to create unique differentiators or establish new revenue streams.

A concrete example: from DTP control to the graphics studio

One of the printing companies we collaborated with had a DTP department primarily responsible for reviewing customer-submitted files and occasionally making corrections. These corrections were challenging to monetize, as customers had become reluctant to pay for such services. By implementing connected automation, it became possible **to set up workflows for receiving files, automatically checking and correcting them based on the type of print job, and even managing press proofs**. This automation significantly reduced the workload of the graphic designers in the DTP department. As a result, the company's director decided to redefine their roles, launching a graphic design initiative by establishing an in-house creative studio. Consequently, **the print shop successfully broadened its service offering**, introducing a highly anticipated solution for its customers while effectively increasing its value. From a human resources perspective, this transition was widely welcomed by the teams involved.

Connected automation goes beyond being a simple tool for the pre-press workflow - it represents both a mindset and a methodology, rooted in a thorough analysis of a company's operations and a continuous pursuit of improvements. Much like a precision engineer in Formula 1, the goal is to identify and implement small yet impactful adjustments that enhance performance and ultimately lead to victory. In the intensely competitive landscape of the printing industry, this approach is a crucial factor in achieving success.

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3. Web-to-print myths and the importance of Connected Automation

Printers in crisis often perceive web-to-print as their ultimate lifeline. This was especially evident during the Covid pandemic when travel restrictions left sales representatives unable to move. However, if they have received poor guidance or been misled by overly persuasive promises, printers can quickly find themselves overwhelmed by web-to-print.

3.1. Web-to-print, an unforgiving world

If you haven't yet delved into online sales, you might assume it's a straightforward process. Simply advertise, launch a website, and customers will manage everything on their own. What many printers fail to realize, often discovering it too late, are the hidden complexities beneath the surface:

- Online printers engage in intense price competition, made even fiercer by price comparison platforms such as Google Shopping.
- The costs associated with acquiring customers (through Google Ads, Facebook, LinkedIn) are constantly climbing, and since these platforms operate on a bidding system, the more competitors there are, the higher the cost of keywords - including those tied to your own brand!
- Customer loyalty is scarce: online shoppers quickly jump from one option to another, chasing the lowest price and best deal, and at the slightest dissatisfaction, they can severely damage your reputation with harsh reviews.
- The average order value is significantly lower compared to traditional sales channels, yet the operational complexity remains unchanged, ultimately cutting into profit margins.
- Finally, technological investments are both substantial and continuous. To stay competitive, you must consistently enhance system performance and security, while also upskilling your teams. On top of that, recruiting qualified professionals in this sector is particularly difficult and time-intensive.



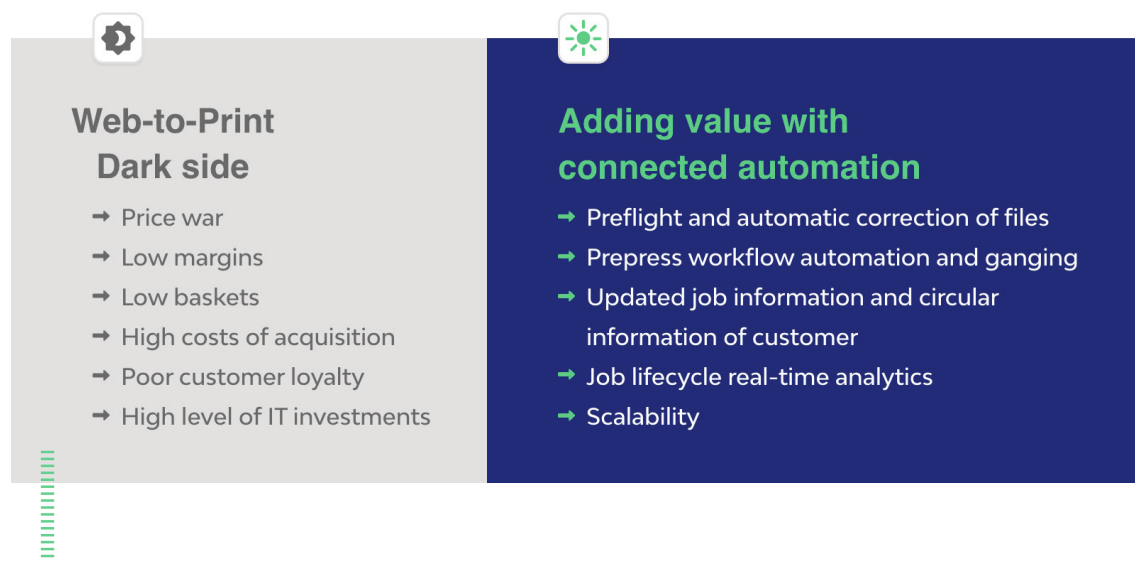


3.2. Connected automation at the heart of web-to-print success

In such a demanding environment, sustaining your profit margins requires flawless optimization of the entire customer journey. Every time data is re-entered, every miscommunicated detail, and every manually sent email chips away at your profitability, leading to costly inefficiencies in terms of time, money, and brand perception. These points of friction must be eliminated.

Optimization starts with automating the transfer of orders from the eCommerce platform to your ERP using APIs and structured file formats such as JSON, XML, or JDF. Customer-supplied files must be automatically inspected, corrected, and ganged without requiring manual intervention from your team. This not only maximizes efficiency but also minimizes the likelihood of errors. When it comes to ganging, automated workflows help reduce material waste to the bare minimum while optimizing ink usage based on printing parameters.

As demonstrated in the introductory example, automating customer communication is just as crucial. This includes order confirmations, invoices, shipment tracking details, and even requests for customer reviews. A satisfied customer is valuable, but a satisfied customer who actively shares their positive experience is even more beneficial! This type of engagement helps build trust and improves conversion rates, turning prospects into loyal customers.



4. Securing your print business

In the modern business landscape, print shop managers are primarily focused on maintaining a steady stream of orders while ensuring profitability. This remains their top concern in both the short and long term.

Beyond this, they are also working to secure the long-term viability of their operations. Connected automation plays a vital role in safeguarding a printing facility's future by providing stability on multiple levels.

4.1. Expanding your sales channels

Through our experience, we have found that at-risk print shops often rely too heavily on a small group of key clients or a single market segment. In contrast, more resilient businesses have successfully broadened their customer base and diversified their sales strategies.

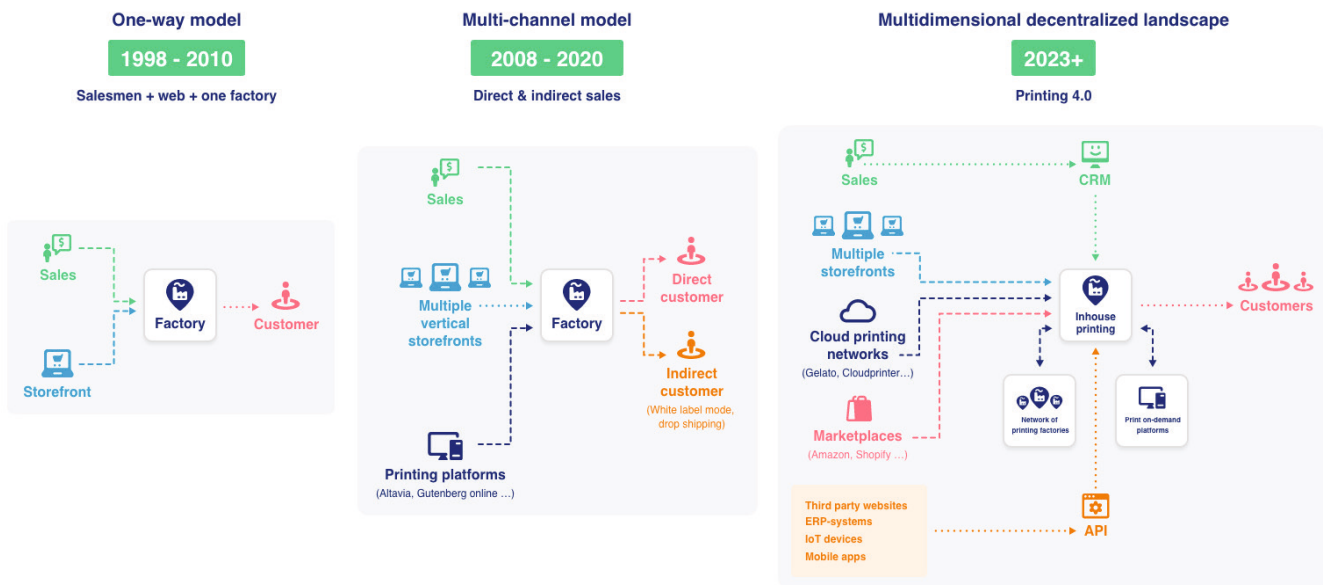
By expanding their range of sales channels, they create a safety net in case of a downturn with a key client or within a specific market. To minimize risk exposure and reduce dependence on a few clients, print businesses need to assess their current market position and seek ways to expand customer touchpoints.

A Look Back at Industry Evolution

Over the last **25 years**, the print industry has undergone three major phases of transformation:

- **From the late 1990s to the early 2010s**, sales were primarily driven by large teams securing contracts and print jobs. Some businesses complemented this approach with online order-taking platforms.
- **The 2010s** witnessed a surge in eCommerce, radically shifting purchasing behaviors. Web-to-print platforms became more widespread, with some opting for a drop-shipping model while others focused on niche stores catering to specific markets. Meanwhile, major printing platforms established dominance with large enterprises and retailers.
- **Since 2020**, the market has become significantly more complex. While traditional sales teams and online platforms remain relevant, new channels have emerged, including consumer (Amazon, Facebook) and B2B (Alibaba) marketplaces, print-on-demand services integrated with Shopify (such as Gelato and CloudPrinter), and APIs connecting to enterprise ERP systems. Print shops now manage their own production while also fulfilling orders for others or outsourcing work to industry peers.

Evolution of the printing industry since 1998



With digital transformation accelerating, opportunities for customer engagement have become almost limitless. The industry has evolved from a straightforward structure into a highly interconnected network, emphasizing "coopetition" - a balance between competition and collaboration when mutual benefits align.

4.2. Leveraging Connected Automation to broaden your customer reach

To fully capitalize on these opportunities, your IT infrastructure must be capable of integrating with various sales and production channels:

- APIs and web services for customer ERP and CRM systems
- Connectors for print-on-demand networks
- Online marketplaces
- Automated workflows utilizing hot folders

Your system must be both intelligent and adaptable - not just for establishing connections, but also for processing jobs from multiple sources efficiently. This means handling XML, JSON, and JDF data streams, consolidating orders, and sending relevant updates to designated endpoints.

Without connected automation tools, keeping pace with these requirements would be impossible, leaving your print business disconnected from the broader industry ecosystem.

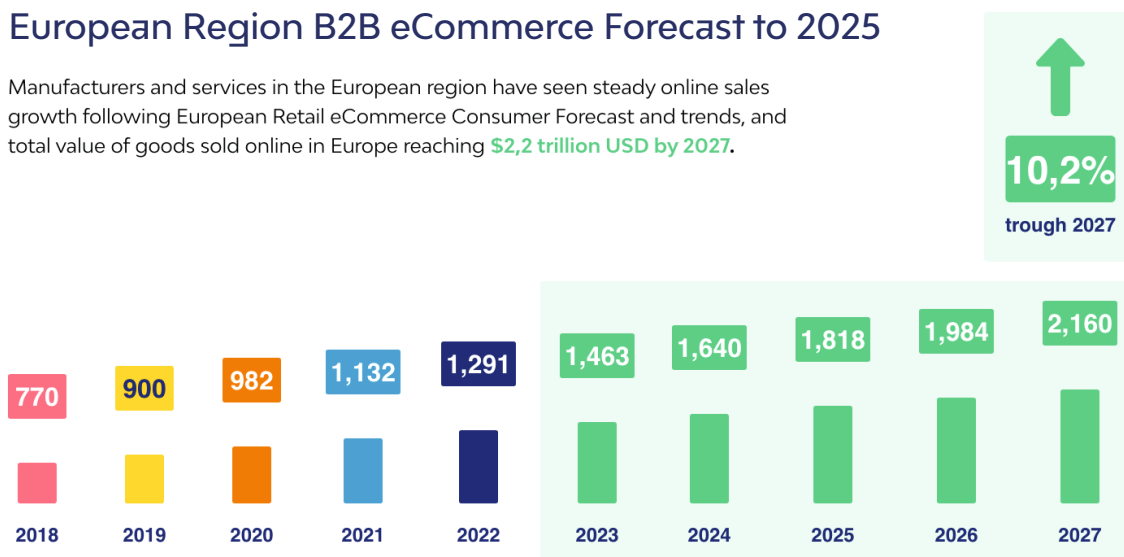
4.3. Building lasting customer relationships

4.3.1. Adapting to changing B2B buyer expectations

The Covid-19 crisis significantly altered business dynamics. B2B eCommerce is now growing at an annual rate of over 10%, outpacing B2C growth, with no signs of slowing down. Both large corporations and SMEs have upgraded their digital tools to improve efficiency, and they now expect suppliers to meet these evolving needs.

European Region B2B eCommerce Forecast to 2025

Manufacturers and services in the European region have seen steady online sales growth following European Retail eCommerce Consumer Forecast and trends, and total value of goods sold online in Europe reaching **\$2,2 trillion USD by 2027**.



The European market is projected to grow at 10,2% through 2027

Connected automation is key to maintaining long-term client relationships. In the past, buyers and suppliers communicated through email or web portals, using sales representatives to request quotes and process purchase orders manually via ERP systems. While effective at the time, this approach was inefficient.

Today, ERP systems serve as centralized procurement hubs, ensuring seamless transaction management. Supplier catalogs must be fully integrated into these systems, aligning with contractual agreements. Orders are now initiated directly from the buyer's ERP, automatically sent to the print shop's system, which then provides real-time updates on production status, invoicing, and analytics.

Many print shops are currently unable to integrate their services with customer ERP systems or synchronize production data in real time. However, with the right connectors and workflow automation, connected automation enables efficient, data-driven interactions - providing a competitive edge and securing long-term client relationships. **In a world increasingly driven by data, businesses that fail to communicate in their customers' digital language risk losing relevance.**

4.3.2. Strengthening customer retention in B2C markets

Printers catering to smaller B2C customers - such as individuals, associations, and small businesses - face different challenges. The cost of customer acquisition through paid ads (Google, Facebook) has risen significantly, yet many web-to-print customers only place one-time orders.

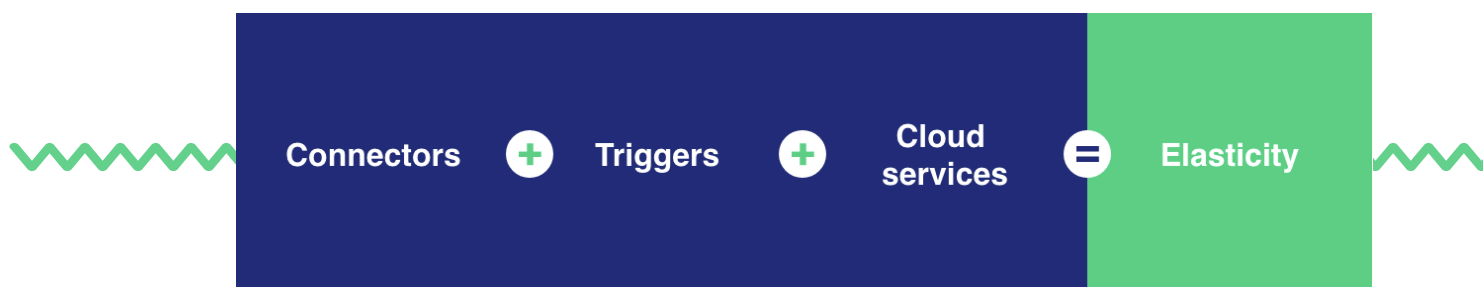
While some companies use loyalty programs, **data-driven retention strategies are more effective.** By linking web platforms with CRM systems and external data sources, businesses can execute highly personalized marketing campaigns - known as "triggered marketing." This enables targeted promotions based on birthdays, purchase history, abandoned carts, or browsing behaviors, boosting repeat purchases. Beyond digital strategies, **variable data printing allows for personalized print campaigns that enhance customer engagement.**


By integrating these automation strategies, print businesses can strengthen customer retention and maximize the return on their marketing investments.

4.4. Adapting to market shifts in real time

The past four years have been anything but stable. After a strong 2019, the Covid-19 pandemic disrupted business operations, leading to lockdowns and a surge in online sales. By 2021, supply chain disruptions, material shortages, and cost spikes created new challenges.

To navigate such uncertainty, print businesses must be both resilient and adaptable. Many, however, have realized that their organizational structures and IT systems are not flexible enough to react quickly to market shifts.





A modular IT infrastructure - built on connected automation and cloud-based services - provides the agility needed to scale operations up or down as required.

By adopting modular components, replacing outdated systems, or integrating external tools, businesses can rapidly adapt. Hosting strategies also play a role: while many print shops still rely on on-premise servers, cloud-based solutions offer scalable computing power, storage, and bandwidth to accommodate changing demands.

4.5. Harnessing your strengths amid market consolidation

Organizational flexibility is crucial not only for managing growth and seasonal fluctuations but also in adapting to a significant trend reshaping our industry: consolidation. In recent years, many business owners in the printing sector have chosen to sell their companies - often to emerging groups looking to expand. Whether these groups specialize in self-adhesive labels, packaging, or operate as generalists, they typically generate hundreds of millions of euros in annual revenue and rely on a network of production facilities across Europe.

In this landscape, **the adaptability and scalability of information systems play a key role.** For sellers, a well-structured IT infrastructure enhances business value, while for buyers, it ensures a smooth integration process, making the transition into a larger entity more seamless and efficient.

Strengthening cybersecurity measures

Like all businesses, print shops face cybersecurity threats. In some cases, they are even more vulnerable due to specific risk factors:

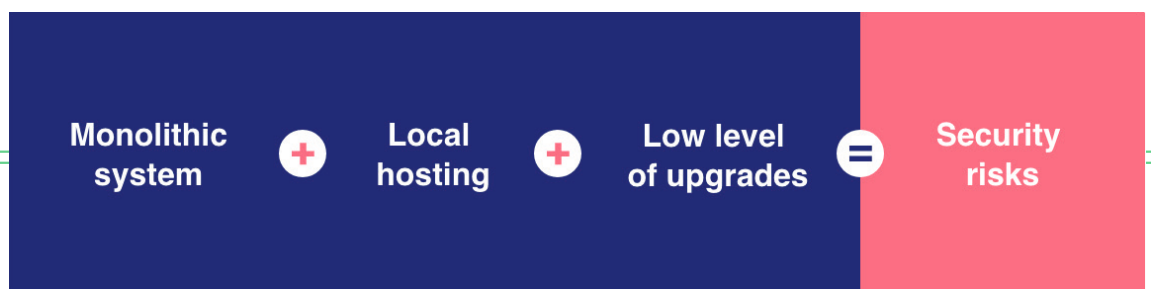
- Monolithic software systems that centralize all business functions
- On-premise infrastructure, often located in a single facility
- Outdated production IT systems lacking regular updates
- eCommerce platforms with inadequate security protections

The principles of connected automation play a crucial role in strengthening the security and resilience of your information system:

- **Cloud services & disaster recovery:** Utilizing Cloud modules helps mitigate risks associated with local hosting by relocating key components to data centers and integrating redundancies. This ensures that business operations can recover smoothly in case of a disaster, including those that compromise a building's integrity, such as fires or floods.
- **Risk reduction through cloud and modular architectures:** Transitioning from a monolithic system to a modular architecture with interconnected cloud-hosted components significantly minimizes risks. Each module and connector is maintained and updated by specialized providers. Instead of concentrating risk within a single system, it is spread across multiple modules, which can be isolated when necessary.
- **System vulnerabilities:** Locally hosted monolithic systems often resemble fortresses built on unstable foundations. While they may appear well-protected, their primary weakness lies in their rigidity. A single failure - whether due to a physical server malfunction, a broken fiber connection, or a cyberattack - can bring the entire system to a standstill, sometimes permanently. In contrast, a modular architecture with connectors and automation offers greater adaptability and, most importantly, the ability to replace an unavailable component with an

alternative. Consider a simple example: an e-mail server, which serves as a critical hub for customer communication, sending quotes, invoices, and order tracking updates. If this server is hosted locally on the main system and experiences a failure or cyberattack, business operations will remain at a standstill until the issue is fully resolved. The downtime could significantly disrupt activity. However, within a modular architecture, email services are managed by one or more cloud-based providers, integrated with ERP and CRM systems through connectors and automation. If a failure occurs, another service can take over to ensure business continuity.

- **Maintainability & scalability:** A major factor in cybersecurity is an organization's ability to keep all its software and operating systems updated - a fundamental best practice. Unfortunately, the reality is that most printing companies struggle to consistently update their servers, virtual machines, operator workstations, and websites due to constraints such as time, resources, or reliance on outdated software. By integrating cloud modules with local software, connected automation helps alleviate technical debt by making updates and scalability more manageable. Even if older software is no longer upgradable, the components and connectors it interacts with can be maintained at the latest versions, reducing risks and enhancing the overall system's scalability.



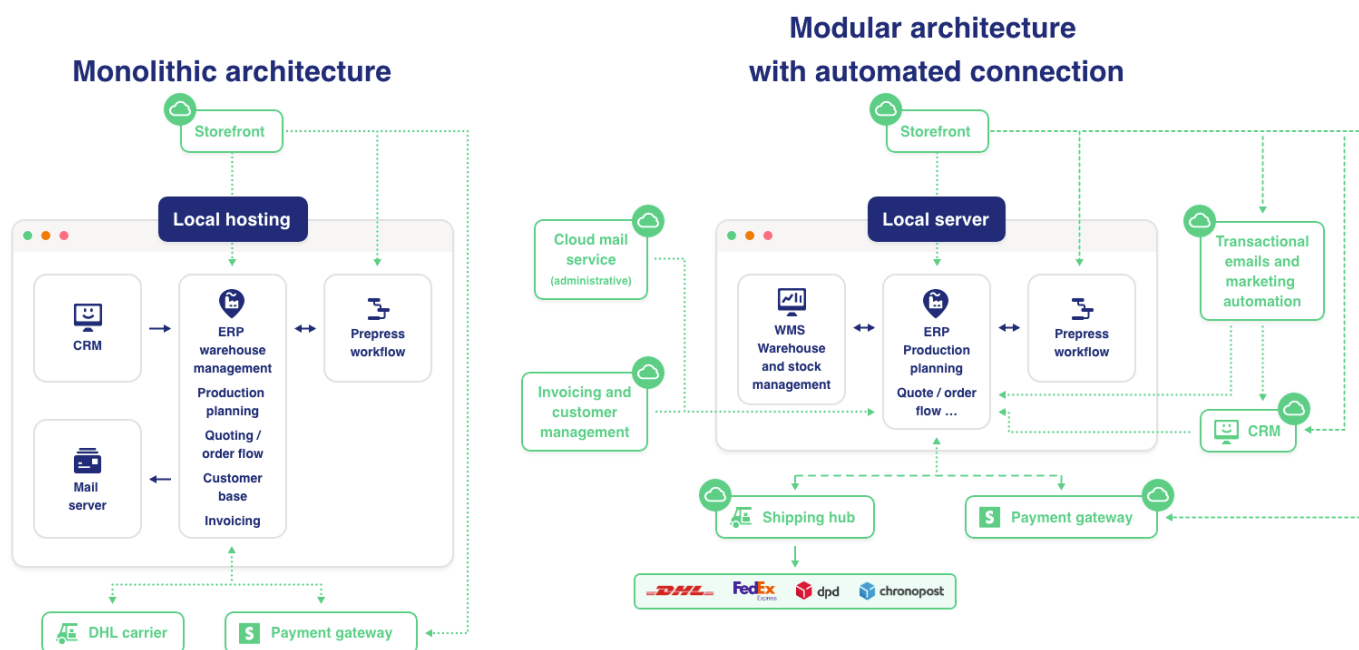
4.6. Reducing IT vendor dependence

Similar to other industrial businesses, printing companies rely heavily on essential software solutions such as their ERP/MIS and DTP workflow management systems. Over the past decade, these tools have played a critical role in overseeing nearly all company operations, spanning from quotation development to invoicing, as well as production scheduling, inventory control, and logistics.

As a result, printing businesses become highly dependent not only on the reliability of these solutions but also on the strategic decisions made by software providers. In cases where a provider undergoes an acquisition or faces operational challenges, numerous printing companies have found themselves at a complete standstill due to shifts in direction from their long-standing software vendor. This often leaves them with only two difficult options: either cease further development or undertake a costly transition to an entirely new system.



✓✓✓ Monolithic architecture vs. modular architecture with Automated connection



Connected automation helps minimize system dependency by extracting from the central platform all services that do not directly relate to core business functions or for which more efficient or cost-effective alternatives exist in the market. The integrator will remove a specific operation from the ERP and substitute it with an integration to an external service.

Take shipment and carrier management as an example: integrating an ERP with a carrier's IT infrastructure is both expensive and complex. This complexity often restricts the ability to enhance transport offerings. As an integrator, we can replace your ERP's built-in carrier management with a cloud-based connector that, through a single link, grants access to virtually all logistics providers in the industry. This type of straightforward upgrade not only reduces the size of your core system and, in turn, your reliance on the software provider but also provides a significant competitive advantage that your sales team can use to attract and retain customers.

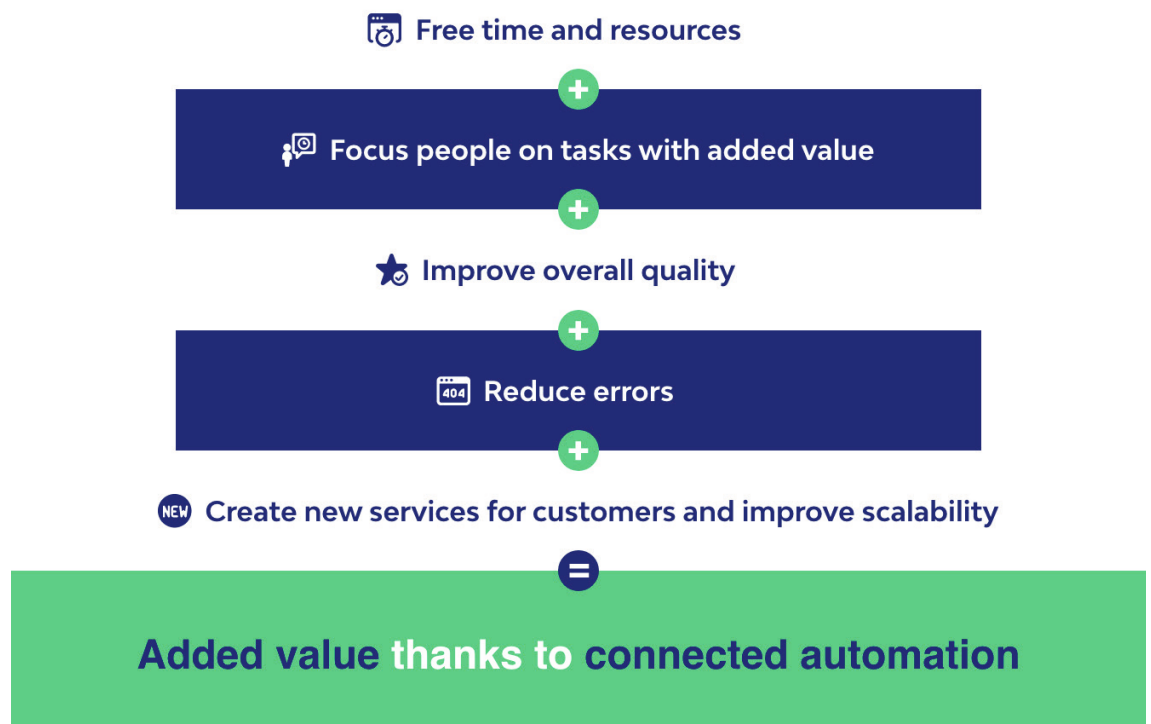
5. Scalability is the key to success

In a world that is constantly evolving and filled with uncertainty, the businesses that thrive are those that can adjust to new circumstances. This goes beyond mere survival - challenging periods still present opportunities that must be swiftly capitalized on to establish a fresh competitive edge. The term "agility" is frequently used, sometimes inaccurately, but that is precisely what is required. Companies must be adaptable, fast, and as nimble as a cat in responding to shifts in the business landscape, whether those changes bring challenges or advantages.

All the aspects we have discussed so far contribute to enhancing your capacity to adjust:

- To take advantage of sales opportunities through emerging markets, evolving consumer behaviors, or alternative order channels.
- To swiftly scale your production systems to handle increased order volumes or specific seasonal fluctuations.
- To integrate these changes without overwhelming your workforce, causing disruptions, or facing recruitment-related bottlenecks.
- To uphold a high standard of safety at all times.

By fostering seamless integration between various software systems and leveraging the flexibility of cloud-based solutions, connected automation provides businesses with genuine adaptability. It enables them to scale operations at a rapid pace and respond to market changes in near real time.



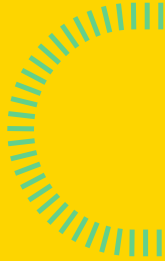
**Connected
automation**



in printing



from case studies



to



implementation



Case study ... **Solopress**



Watch the full video here



Empowering Growth: Solopress' Journey to Success Through Connected Automation with Four Pees . . .

■ ■ ■ ■ ■ Solopress, based in Southend-on-Sea, United Kingdom, is an online commercial print service provider to both trade customers and end users. Established 25 years ago, Solopress has grown significantly and now offers a range of products across litho, digital, and large format print products.

Rewind to 2010 and Solopress is making an innovative move into selling print online, and the decision was a potentially risky one. There was a lack of clarity around whether print buyers wanted to buy online, and the infrastructure at the time wasn't ideal. For Solopress it was a venture that paid off and facilitated rapid growth in the subsequent years. While this early adoption served as a significant differentiator, the market has become increasingly crowded, and with Solopress still on its growth trajectory, maximising productivity is vital.

Growing with purpose and productivity

As the business grew and orders increased, so did the number of manual tasks and processes.

"Everything's manual so it's 'drag, click, drop', quite time-consuming for an experienced press operator to be standing in front of the computer," explains Peter Storey, Workflow Specialist at Solopress. "The company was growing, and orders were increasing," adds **Rob Lagden Workflow Architect at Solopress**. "It was quite manual checks and fixes of customer-supplied artwork, so we looked into ways of eliminating those mundane manual processes, those repetitive processes, and we started to look at software, workflows, and automation to take those mundane processes away from the operator so they could concentrate on more important things."

In 2018, **Rob** met Tom Peire and David Van den Driessche, Four Pees' CEO and CTO respectively,

and was impressed by their expertise, as well as the product they were demonstrating – callas pdfToolbox, a manual PDF pre-flight and correction application. After meeting Tom and David, he felt that Four Pees would be a beneficial partner for Solopress as it sought to implement automation and eliminate repetitive tasks. "The main issue we had at the very start was making those workflows more robust," Lagden continues. "callas pdfToolbox did that. That was the beginning."



"The company was growing, and orders were increasing,"

Finding the right automation solutions

Since the relationship with Four Pees began, Solopress has continued to optimise and fine-tune its processes. "As the workflows grew, the more and more Four Pees were helping," says Lagden. "Over the past five years, Four Pees have helped us make our workflow more robust and more optimised, evaluating flows we had running that took minutes to perform actions, down to seconds to do the same thing. Out of 2000 orders a day, 500 are manual, and the rest are fully automated. In the next couple of months, we're looking at the way we automate imposition, ganging and batch outputs based on job type, material and print devices. Andy Banks at Four Pees is helping us with the applications **Imp Layout and Imp Flow developed by Insoft Automation**. That's where my focus is for the next couple of months." (**Imp** is an automated imposition and planning tool designed for today's versatile printers who have an array of printing machines producing a wide range of print products.)

"Out of 2000 orders a day, 500 are manual, and the rest are fully automated."



Peter Storey

notes that the manual nature of Solopress' growing large-format output has been transformed since the implementation of **Enfocus Switch**, a modular automation solution designed connect a seamless



workflow and automate repetitive tasks. He explains: "I've used workflows in conjunction with several pieces of software, and the RIPs. Now we just commit work to the press via **Switch Client**, and users in the factory and production can also interact with jobs via the Switch Client. It prints the job tickets as they commit to press, gathers the monitor to sheet length, and releases it to the machine." Peter also highlights the **Private Data Magician app** as a specific example of Four Pees' expertise supporting Solopress to keep improving and optimising. He adds: "[Four Pees] is sometimes like as an additional member of staff really, to get some ideas how to optimise things."

Managing Director of Solopress Simon Cooper notes the advancements made in the last four years, due in no small part to the effective implementation of automation: "If we compare the business right now with the business in 2019, we almost don't deliver a job late. This month we're 99.85% on time dispatch rate, so we've been able to massively improve, and one reason for that is whereas in the past we were dealing job by job, we're now automating those processes and getting work through and on to the press is much, much quicker."

Saying 'so long' to siloes with Connected Automation

What do we mean by 'Connected Automation', and why are we so passionate about it? **Connected Automation is about connecting all the elements of a workflow together, and not only allowing for a smooth, seamless flow from planning to product, but automating the entire process as much as possible.** A certain automation or a singular software unfortunately doesn't make for a harmonious workflow, but living and breathing Connected Automation absolutely does.

For Solopress, adopting the Connected Automation ethos has played a key role in its success, not only saving time and money through the reduction of mundane processes, but also ensuring the skilled operators are focused on more engaging and rewarding tasks. Simon explains: "The investments that we've made both in terms of Connected Automation, but also production equipment and technology have massively enabled us to improve productivity in the business. What we knew was we wanted to automate simple tasks, basic tasks that were actually quite

"I think our peak day was almost 2800 orders, but of those 60 to 70% will come in and go out the same day. Where Connected Automation made the biggest difference for our customers was being able to automate the process of that."

tedious and tiresome for humans to keep carrying out time and time again."

Simon reflects on the Solopress 'print delivered tomorrow' principle, adding: "I think our peak day was almost 2800 orders, but of those 60 to 70% will come in and go out the same day. Where Connected Automation made the biggest difference for our customers was being able to automate the process of that. There was no time lost in queuing up and waiting for humans to carry out a certain process. In a perfect world, a customer will specify their product themselves online, upload their artwork and approve directly online, and from the moment they approve their proof to us having it queued up and ready to be printed on a press can be as little as a minute and a half."

For forward-thinking businesses like Solopress, Connected Automation forms a central part of a compre-

hensive growth and productivity strategy, although it is of course not the only ingredient in the pie. "Look at our revenue divided by all the hours that are worked in the business; we've seen a 76% improvement in productivity since 2019," notes Simon. "To being able to see a 76% improvement in productivity is just incredible. I'm not going to say 100% of that is down to Connected Automation, but it's a big contributing factor to that improvement in productivity."


"We've seen a 76% improvement in productivity since 2019"

Innovative print businesses keep their eyes on the road, and are always thinking about where they are heading, as well as maximising success in the here and now. At Four Pees, our automation experts are there to support you as you navigate

your journey and accelerate your productivity. Solopress are a textbook example of a business using Connected Automation to take its inherent value proposition that extra mile further.

Simon

concludes:

"We saw the need as an organisation to start driving automation quite early on, and whenever you do that you look for experts. We've got some talent that's developed within our own business; people that I would now describe as experts. I'm really looking at what are the benefits that the business sees, and I can see very clear benefits. I'm really pleased with the fact that the Solopress team have a good partner. They tell me we have a good partner in Four Pees and we're certainly seeing positive results within the business." 



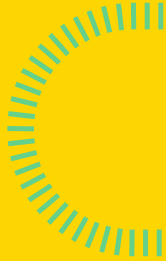
**Connected
automation**



in printing



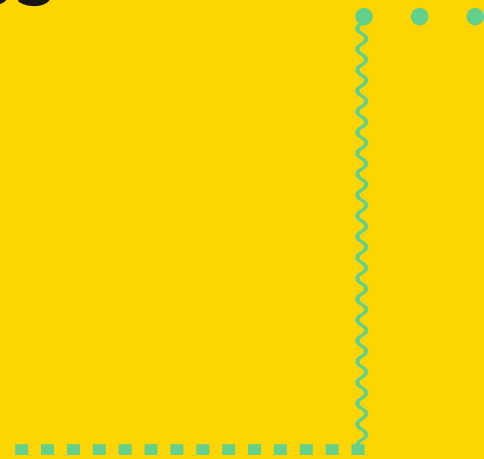
from case studies



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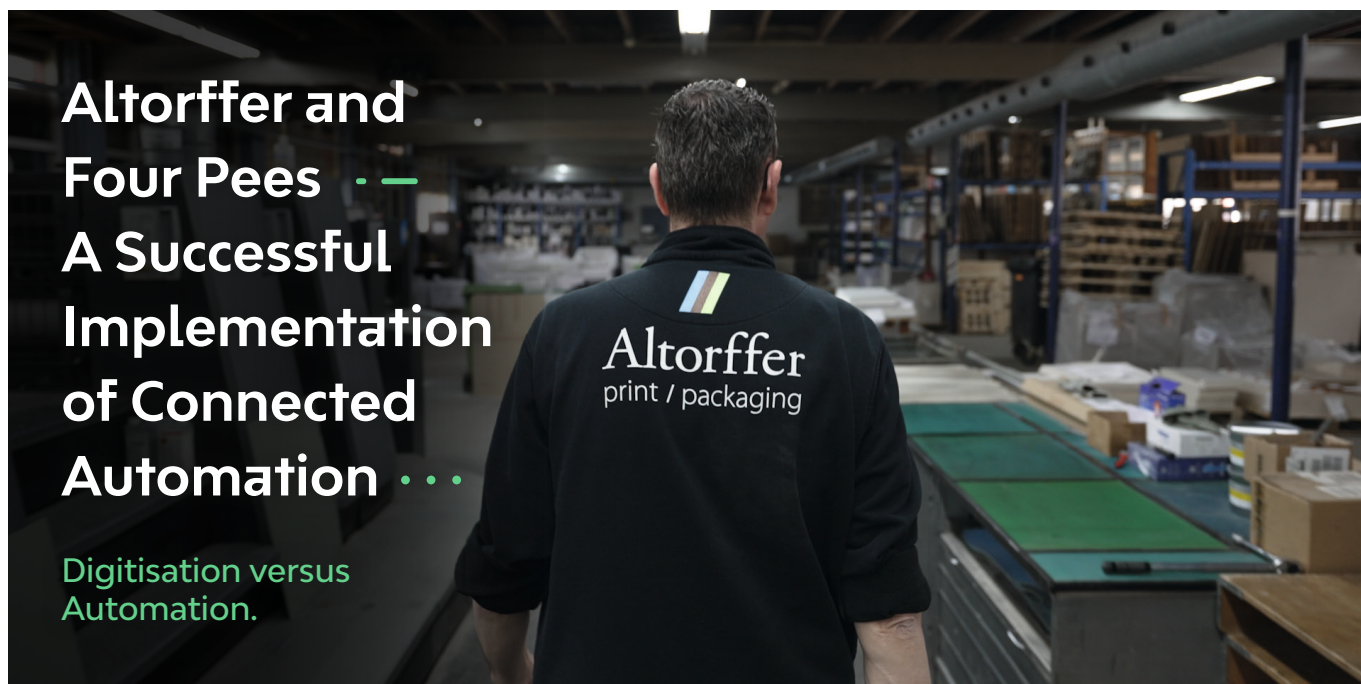


Case study . . . **Altorffer**



Watch the full video here





Altorffer, a printing and packaging business in Roosendaal, The Netherlands, has a rich legacy in print, with a history dating back to 1784. This esteemed heritage does not, however, mean that the Dutch printing house is not forward-thinking; Altorffer has a strong focus on innovation, and is a firm believer in the power of connected automation.

An initial brief for print systems distributor and integrator Four Pees focused on Altorffer's desire to improve print file preparation and maximise its Enfocus Switch investment. Before long, it was clear that Four Pees had much more to offer than simply optimising preflighting.

Digitisation and automation are buzzwords these days, but there is an important distinction between these terms. Digitalisation means using software and computers instead of analogue processes, but it is not the same as automation. Automation goes further and simply buying a product or technology does not solve anything. It is the implementation of the product that solves the problem. Unfortunately, poor implementation is often due to a lack of strategic focus, the right technical profiles, and resources.

Simultaneously, multinational eye care specialists Alcon, a long-time Altorffer customer, was experiencing a similar need for enhanced automation, specifically relating to marketing order processing and delivery. With a tight deadline of just a few months, Altorffer knew there was no room for workflow and production inefficiencies if they were going to meet the demands of the Alcon project. So, the Four Pees partnership that started as a project to improve preflight processes soon developed into a fully integrated system of automating orders, inventory management, and communication with customers and suppliers.

A customer project with a clear vision for success

The main aim of the project was the comprehensive automation of Alcon's marketing orders. The Alcon Marketing Tools platform (AMT) handles everything from file receipt to delivery notes, and automatically communicates with platforms such as Prindustry and Sendy for delivery, allowing Altorffer to handle higher volume with fewer manual interactions. **Philippe Moons, Digital Marketing Manager Alcon** says: "This platform was launched with the main purpose of helping our customers, the opticians, to order marketing materials in order to make it easier to market our products to the end user."



"Since the launch, the number of active users has doubled, and we are seeing a 50-60% increase in orders."

The implementation of the platform has been game-changing for Alcon, allowing the opticians to order the products they need themselves and reduce touchpoints in the marketing order process. The results are evident, as Moons continues: "Since Alcon Marketing Tools - our ordering platform for marketing materials - was launched, the number of active users has doubled, and we are seeing a 50-60% increase in orders. This ensures that more marketing is happening for our products, which further strengthens the success of the platform."

Connected Automation, a catalyst for job satisfaction and efficiency

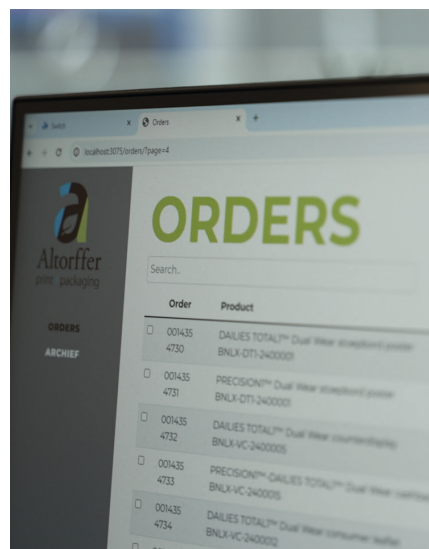
Such an extensive project with a strict deadline would not have been possible without Altorffer's approach to connectivity and automation, as **Mireille van Osta**,

team leader, Pre-press Innovation & IT at Altorffer, says: "We have been working on automation within Altorffer



for over a decade. Over the years, we have learned that to get the most out of your workflow, you have to automate the smaller problems first. When you connect all these processes together, you create a whole new efficiency: connected automation."

"Over the years, we have learned that to get the most out of your workflow, you have to automate the smaller problems first."



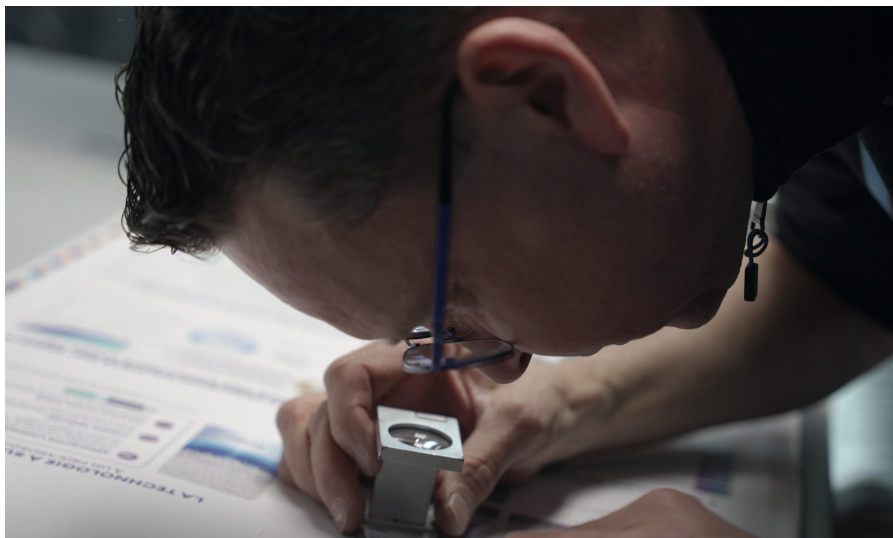
The impact of connected automation goes beyond the improvement of print production efficiency; it boosts job satisfaction thanks to the reduced need for members of the team to carry out repetitive tasks, which in turn allows them to focus on more high-value, engaging duties. **Eddy Bouwens**, **co-owner of Altorffer**, says: "For us, it is important that our people have interesting jobs, with fewer repetitive tasks and less chance of mistakes. This not only adds to their job satisfaction, but also increases our efficiency. This is why we decided to partner with Four Pees to implement 'Connected Automation'. It connects all our processes and ensures seamless workflows with minimal human intervention."



"Connected Automation. It connects all our processes and ensures seamless workflows with minimal human intervention."

“You get more peace of mind. Everything is now in its place, and if stock is running low, we automatically receive a notification so that we can start new printing orders in time. As a result, work has become easier and clearer.”

The benefits of the partnership with Four Pees are felt across Altorffer, and not only due to the success of the Alcon project. **Natasja van Gils**, team leader, PostPress and AMT and thus also responsible for post-processing in Alcon production, highlights the convenience offered by the new automation: “You get more peace of mind. Everything is now in its place, and if stock is running low, we automatically receive a notification so that we can start new printing orders in time. As a result, work has become easier and clearer.”



to change, but the process went smoothly. There were no struggles and confidence in the system grew quickly.”

as Altorffer will continue to lead the pack thanks to its mindset. **Eddy Bouwens concludes:** “We have noticed that this trajectory of connected automation is of interest to many of our customers. Our mission is to take Altorffer to version 2.0 by connecting and automating all our processes. This will enable us to generate more revenue with the same number of employees and strengthen our unity. This is the future for a graphics company like ours.”

Marieke Kiebert, P&O and Financial Administration, is also part of the management and responsible for human resources and financial administration, is also enthusiastic: “The project was set up quite smoothly. In the beginning, you don’t know exactly what is going

A look to the future

This success story does not end here. Connected automation is an increasing requirement for print businesses looking to remain competitive and profitable in today’s environment, and companies such



Why do too many automation projects fail?

Poor implementation

Recipe for Successful Automation

1. Strategic focus

- ~ Supported by/involvement of the management & the entire company
- ~ Resource allocation
- ~ Not one-off, but ongoing

2. Method

- ~ Project scoping
- ~ KPI assessment
- ~ Assisted go-live
- ~ In-house training
- ~ Follow-up

3. Skills

- ~ Industry knowledge
- ~ Digital strategy expertise
- ~ Business model impact
- ~ Deep tech product mastery
- ~ APIs and scripting

6. Connected Automation

6.1. Practical examples

Now that we've explored the concept and benefits of connected automation, let's dive into some practical examples of how connectors and automation can be implemented in a print shop enhancing efficiency across the entire customer journey.

PHASE	CONNECTION TYPES	PROFITS
LEAD NURTURING	CRM connection with email marketing platform	<ul style="list-style-type: none">• Import trade show leads into CRM.• Trigger post-show email marketing campaigns to encourage orders.• Analytical tracking of the conversion of trade show prospects into buyers, and valuation of their order baskets.
LEAD NURTURING	Connecting the website with CRM	<ul style="list-style-type: none">• Direct marketing campaigns including QR codes and promo codes.• Track promo code usage and clicks to calculate campaign performance.
ORDER FLOW	API connection with a customer's eCommerce platform	<ul style="list-style-type: none">• Automatic retrieval of order information by the printer: files, job ticket, JDF / XML, comments.• Automatic transmission of order status updates and delivery information to the customer.
REORDERING PROCESS	Connection between website, customer file storage area and prepress workflows	<ul style="list-style-type: none">• Customer loyalty thanks to "free" reprint service.• Fewer calls to customer service to search for and remove old orders.
CUSTOMER CARE	Connecting website chat to CRM, itself connected to ERP	<ul style="list-style-type: none">• The agent answering the chat visualizes the caller's order history to provide a contextualized response.• In the case of an order placed by a new customer, identification that the purchase is the result of a chat thread.

PHASE	CONNECTION TYPES	PROFITS
CUSTOMER CARE	Website connection with CRM and ERP	<ul style="list-style-type: none"> • Consolidated customer information, whatever the sales channel. • Every member of the sales team has a 360° view of the customer's purchase history, broken down by channel, even when on the move. • The customer's global history is available in his customer area on the website.
FILE CHECKING	Automated file processing and connection to the production tool	<ul style="list-style-type: none"> • Automated file reception. • Check and correct customer files according to print type and output profiles. • Gang orders with the same paper/finishing/time characteristics. • Optimization of inking rates according to machine dispatching. • Preparation of cutting tools.
LOGISTICS	Connection between ERP and shipping system	<ul style="list-style-type: none"> • Help in choosing packaging cartons according to parcel characteristics. • Grouping parcels by destination. • Route planning for delivery trucks.
SHIPPING	Connection between ERP and hub-type shipping platform	<ul style="list-style-type: none"> • Intelligent dispatching of orders to multiple carriers according to predefined scenarios. • Management of carrier exclusions in specific zones. • Choice of transporters with electric vehicles for downtown deliveries. • Carbon footprint calculations uploaded to ERP and website.
BILLING	Connection between sales management software and website	<ul style="list-style-type: none"> • When the invoice is issued, it is automatically sent from the sales management software to the website, where it is made available in the web customer area. • Automatic email with secure link to invoice.

PHASE	CONNECTION TYPES	PROFITS
SUBCONTRACTING: COMPLIANCE WITH SLA¹	Automation with triggers	<ul style="list-style-type: none"> • For orders from an eCommerce platform, subject to SLAs, prioritization of jobs in the production workflow. • Trigger preventive alerts in the event of schedule delays and risk of SLA overruns. • Real-time SLA compliance dashboard.
CUSTOMER LOYALTY / CHURN²	Connecting CRM, website and marketing automation platform	<ul style="list-style-type: none"> • Detection of declining customer activity (e.g., absence of orders for 3 months). • Trigger an automated scenario to send a personalized email and a conversation on Facebook Messenger, with a special offer including a discount on the eCommerce site.
SATISFACTION SURVEYS	Connection between CRM, website, and customer feedback system	<ul style="list-style-type: none"> • After each order on the website, we automatically send you a customer feedback request. • After a pre-determined number of online and traditional orders, a satisfaction survey telephone call is triggered. • If the score is less than 4/5, an alert is sent to the Sales Manager for an appointment and a customer visit.

¹ SLA: Service Level Agreement

² Loss of customer



6.2. Essential steps for implementing Connected Automation successfully

If this white paper has highlighted the value of connected automation, you're likely eager to get started. To set you up for success, we recommend following these key steps to guide your automation journey.

Trace



- Draw customer journey
- Draw order flow

Identify



- Value leak points
- Pain points
- Improvement axis

Measure



- Time to achieve tasks
- Calculate costs
- Estimate length of processes
- Calculate error rate / number of after-sales

Prioritize



- Action plan with priority levels

Correct



- Define the best workflow to correct problems
- Setup connectors
- Automate tasks thanks to triggers
- Deploy workflow

Evaluate



- Measure gain
- Calculate Return on investment

Optimize



- Debrief the evolution
- Fine-tune the workflow



7. Final thoughts

We hope this white paper has provided fresh insights into optimizing your printing operation. Connected automation isn't a one-size-fits-all solution or a magic fix - it's a mindset, a work philosophy centered on continuously analyzing and refining workflows through smart integrations and automation.

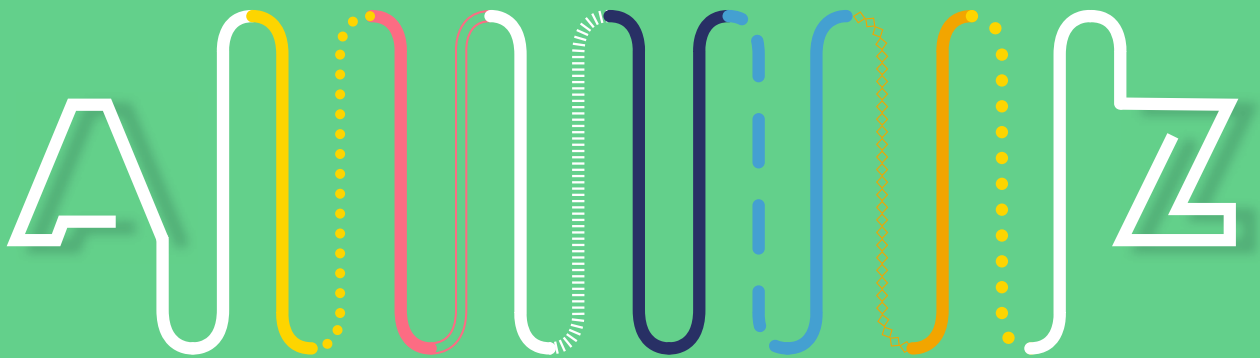
This powerful approach has driven the success of many printing businesses, particularly in the web-to-print space, where early adopters recognized its potential for boosting efficiency and scalability. However, connected automation isn't just for online printers - any company, regardless of size, can implement optimizations tailored to their needs.

At Four Pees, our expertise and diverse skill set enable us to help you identify areas for improvement, develop custom connectors, and streamline automation within your business.

We look forward to connecting with you - whether on our website, in a webinar, or at an upcoming trade show!

We automate your print production from A to Z

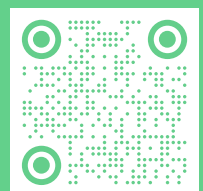
Reimagine your print production. At Four Pees, we help print operations succeed by implementing hassle-free automation. Not only will it make your work easier, but your print organization will thrive. We provide solutions to streamline the entire print and packaging production. Whether it is with advice, a software product or a seamlessly integrated solution from ideation, design and customization all the way up to fully automated production.



Four Pees, feel the good ~ flow



Four Pees NV • Kleemburg 1 • 9050 Gentbrugge
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