Executive summary:

Digital transformation is a key enabler for today's business and supply chain challenges

With supply chain challenges showing no signs of abating any time soon, companies of all sizes continue to navigate shortages and disruption leaving many to rethink their overall supply chain strategies. Adding to this, many companies are still faced with labor shortages. To manage this global impact, today's forward-thinking companies are looking to accelerate their digital transformation programs to create new efficiencies, optimize costs and gain a competitive advantage in 2023 and beyond. When speaking to our customers and partners, it's evident that a cornerstone of digital transformation is cloud adoption, and they are embracing this move. What's more, it's become clear that companies are looking to reduce manual business practices, including their labeling. By modernizing their labeling, companies can digitally transform their supply chain and insulate themselves from disruption, shortages, inefficiencies, and errors. This is why they are investing in automated solutions for both labeling and

packaging artwork which create new efficiencies and address existing concerns. As a matter of fact, a recent Gartner report highlighted that

> ...65% of respondents reported that labor constraints were the primary motivation for investing in automation[1]

This report is based on our survey of nearly 500 professionals from organizations across all major industries and 55 countries. Within, you'll find out how labeling and packaging artwork

[1.] Gartner, Predicts 2023: Supply Chain Technology, Dwight Klappich, Christian Titze, Tim Payne, Amber Salley, Simon Tunstall, 11/28/22

are both areas that offer significant opportunities with digital transformation – opportunities to gain control, save time, increase agility, and stay competitive. You'll learn how the cloud is becoming the preferred method for deployment for labeling and many other business applications. You'll find out how the supply chain continues to impact today's business and how there is an increased focus on traceability. You'll also learn that there is an increased desire for an all-in-one digital solution to manage all types of print devices and learn how new approaches with composable business models are providing the type of agility companies need in today's evolving business climate. Read on to find out how companies that can effectively pivot and embrace new agile strategies for maintaining business and for keeping pace with today's multifaceted, dynamic supply chain will have a competitive edge and will set themselves up for future success.

"Two years ago, 73% of all companies did not have a digital roadmap: regardless of their approach to strategy…

Now we see a full 50% of organizations have either a roadmap where the digital plan mirrors the business plan, or the digital plan is the business plan."

(IDC, Worldwide Digital Transformation 2022 Predictions, Shawn Fitzgerald, Research Director, 10/28/21)

TREND

1

Cloud becomes a preferred deployment method

- **Simplifying maintenance and deployment**

- **Managing growth across your business**

- **Removing barriers to benefits**

The past few years have brought a rapid upturn in cloud adoption with businesses looking to address "anywhere anytime" connectivity. Now in 2023, the cloud has become the preferred deployment method for business applications and for improving supply chain efficiencies. Supporting that notion Gartner reports that

"By 2027, more than 50% of enterprises will use industry cloud platforms to accelerate their business initiatives." [2]

Of course, labeling is one of the areas where we are seeing a significant shift. This is because cloud-based labeling empowers organizations to speed deployment and take fast, corrective actions to eliminate bottlenecks, improve collaboration and time to market, and ensure compliance while future-proofing labeling operations. So, companies focused on digital transformation that successfully exploit and gain benefits from the Cloud are going to be positioned to have an advantage over competitors and set themselves up for the future.
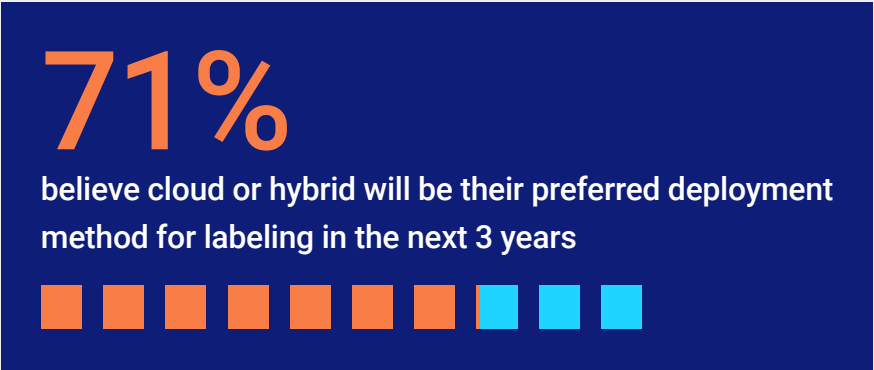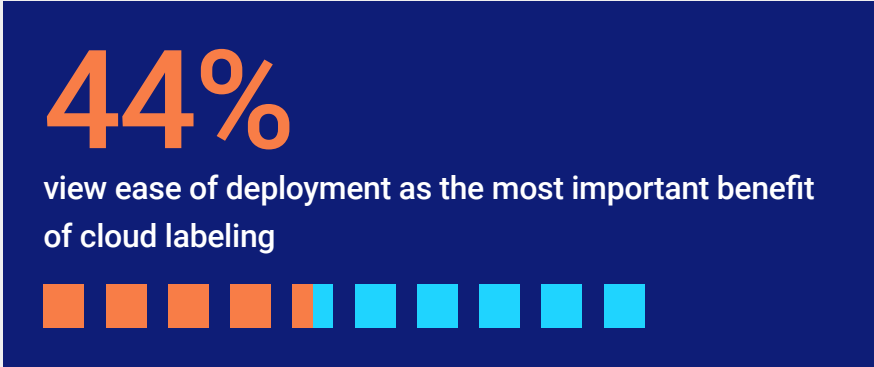
[2] Gartner, Top Strategic Technology Trends for 2023: Industry Cloud Platforms, Gregor Petri, Tiny Haynes, Yefim Natis, Wataru Katsurashima, 10/17/22
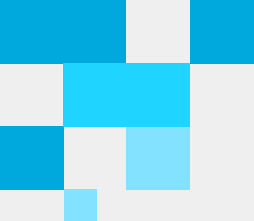
Simplifying maintenance and deployment

One of the biggest advantages of enlisting a standardized and centralized cloud-based labeling approach is reduced maintenance and streamlined deployment. With the Cloud, maintenance is simplified, and upgrades are seamless thanks to on-demand provisioning of hardware and software. Labeling in the Cloud offers a single more holistic approach that allows you to centrally source and manage content, label formats, approval processes, and workflows all from one place. Moreover, cloud-first strategies remove the burden on scarce IT resources and facilitate expansion. This means when it's time to scale labeling you can easily extend to new facilities to ensure consistency and accuracy.

71%
believe cloud or hybrid will be their preferred deployment method for labeling in the next 3 years

44%
view ease of deployment as the most important benefit of cloud labeling

Managing growth across your business

In today's business environment, manual processes represent barriers to growth and scale. However, once digitized in a cloud-based labeling solution, these manual processes quickly give way to the seamless exchange of data. This cloud-based approach allows companies to maintain existing systems and user interactions to improve efficiencies and scale labeling across their entire business ecosystem. Also, cloud-based labeling increases the elasticity of your overall labeling system, giving users more flexibility with re-provisioning, adding, or expanding technological infrastructure resources. Most importantly, users can onboard new sites quickly, provide simplified, consistent, and standardized training via

a user-friendly platform, and extend labeling to suppliers and partners to avoid any potential disruptions. Whether you need to add more locations, increase print volumes, manufacture new products, or comply with regulations, enabling your stakeholders with access is key to adherence with corporate labeling standards.

Removing barriers to benefits

Historically on-premise enterprise software systems were cost-prohibitive for small to mid-sized organizations. The cloud has removed these barriers and put world-class enterprise systems into the hands of companies of all sizes—even those that may be resource-constrained. Cloud-first strategies provide the opportunity to leverage the power of unified, cloud-based solutions that do not require a large IT team or limitless budget. With cloud labeling and artwork management, any sized organization can be up and running quickly, benefit from automatic software updates, can have the opportunity to pay on a subscription basis, and easily scale their printing operations when needed. Additionally, with no IT infrastructure to purchase or maintain, companies can allocate their budgets to other core operating expenses and focus on what they do best: running their businesses.

50%
currently deploy business applications in the cloud

Traceability increases in importance

- **Impact of globalization**

- **Faster reaction in managing recalls**

- **Sustainable sourcing for a better tomorrow**

Consumer engagement, anti-counterfeiting, and regulatory requirements are driving conversations around traceability. Now, today's global supply chain requires new levels of visibility as companies add new partners, expand into new regions, and attempt to meet increasing regulatory and customer demands. Ultimately, enabling transparency throughout the supply chain has become a necessity so that companies can ensure quality, safeguard products, protect patients, streamline the location of inventory, and guarantee on-time delivery to market. To do this, businesses are demanding solutions that enable faster reaction times to manage potential recalls and avert risks presented by falsified goods and counterfeit products all of which could damage brands and threaten customer safety. To manage these threats, businesses must embrace technologies that improve the ability to track and trace products throughout their lifecycle and across the global supply chain.

"By 2027,

80%

of the top 20 global consumer goods companies will meet consumer demand for greater transparency by having complete transparent traceability for one or more product lines."

(Gartner, Predicts 2022: Consumer Goods Manufacturers, Duerst, Sohard Aggarwal, Don Scheibenreif, Jason Wong, 11/18/21)

Impact of globalization

As businesses extend their reach across today's complex global supply chain, they are faced with many new risks and opportunities. Emerging new markets for goods and services along with a more collaborative environment make it possible for companies to reduce costs and participate in global trade. This collaboration requires geographically dispersed partners to bring products and services to market with multiple touch points which must be monitored all along the way - from the handling of raw materials to the delivery of finished goods. Also, any partners and suppliers must be able to access common data, business processes, labeling solutions, and label content. But, most importantly, as businesses continue to scale and embrace globalization, they must also identify new ways to ensure traceability and reduce risks across this evolving global supply chain.

70%

say global traceability is a priority for their business

■ ■ ■ ■ ■ ■ ■ ■ ■ ■

49%

believe inability to effectively manage recalls is the biggest risk of not being able to track products through the supply chain

■ ■ ■ ■ ■ ■ ■ ■ ■ ■

Faster reaction in managing recalls

Product recalls can not only affect the brand but also a consumer's health, especially when it comes to regulated industries like pharmaceutical, medical device, and food and beverage. It has become increasingly important to manage recalls quickly and effectively given that expectations around traceability have increased significantly as technologies offer more opportunity for visibility. Of course, labeling is the vehicle that carries relevant data, such as specific product information, which may include serial numbers, certificates of origin, and lot/batch information to provide the essential link between digital and physical. Ultimately, labeling is an enabler of traceability that provides a full audit trail of a product from

its parts/materials/ingredients to its manufacturing and distribution to the end-user or customer. With proper labeling and traceability, companies can respond quickly to costly disruptions across their supply chain to manage risk and expedite any necessary recalls.

Sustainable sourcing for a better tomorrow

As sustainability initiatives become more mainstream, companies must consider how they can improve labeling and packaging strategies and continue to focus on the customer experience, all while meeting new corporate social responsibility goals and watching the bottom line. Part of the equation is around how social, ethical, and environmental performance factors into the process of selecting suppliers. With sustainability at the forefront, digital traceability can help companies deliver on their commitment. Being able to trace product both upstream and downstream will become important for managing the product lifecycle and ensuring sustainable sourcing. These intelligent supply chains can track, trace, and authenticate goods at every stage of the journey, from raw materials to consumer goods. Additionally, modern labeling solutions reduce inventory, eliminate a large global footprint, and ensure that all products are made, shipped, and delivered to the right place, avoiding loss and waste.
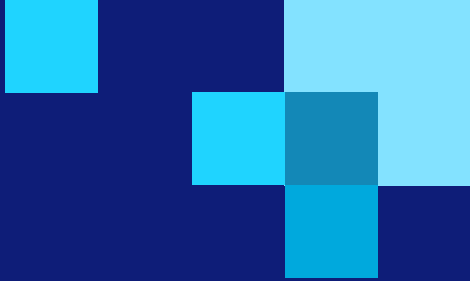
76%
reported having a sustainability initiative

TREND

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Supply chain issues continue to impact business

- **Providing scalable, repeatable remote labeling**

- **Ensuring continuous operations**

- **Enabling suppliers is key**

Companies continue to adjust their business strategies as they look to address the state of today's global supply chain. To survive this shifting business landscape and keep supply chains running smoothly, companies must be prepared to explore alternative ways to optimize business processes and create new efficiencies. More and more corporate leaders recognize the direct connection between labeling and supply chain health. As a result, cloud-based labeling solutions were put firmly on the radar of organizations that needed to extend labeling to new partners and suppliers, accommodate a remote workforce and ensure the continuous movement of parts and products without delays – both upstream and downstream.

"Growing complexity and volatility are forcing supply chain organizations to adjust their technology investments to align with their needs for resiliency, agility and intelligent operations."[3]

Providing scalable, repeatable remote labeling

Companies today are faced with managing a globally dispersed supply chain, which is why it's important to provide users with immediate access to labeling regardless of location – anywhere at any time. Traditionally, it would take time to provide access to label templates and data sources for users at a new location – requiring time spent that companies can no longer afford to waste. It is also best when remote users can use a library of approved label templates rather than recreating their own local versions which tend to introduce the possibility of labeling errors. Any remote users can maintain the same level of printing quality and performance as experienced in networked locations.

[3] Gartner,Predicts 2023: Supply Chain Technology, Dwight Klappich, Christian Titze, Tim Payne, Amber Salley, Simon Tunstall, 11/28/22
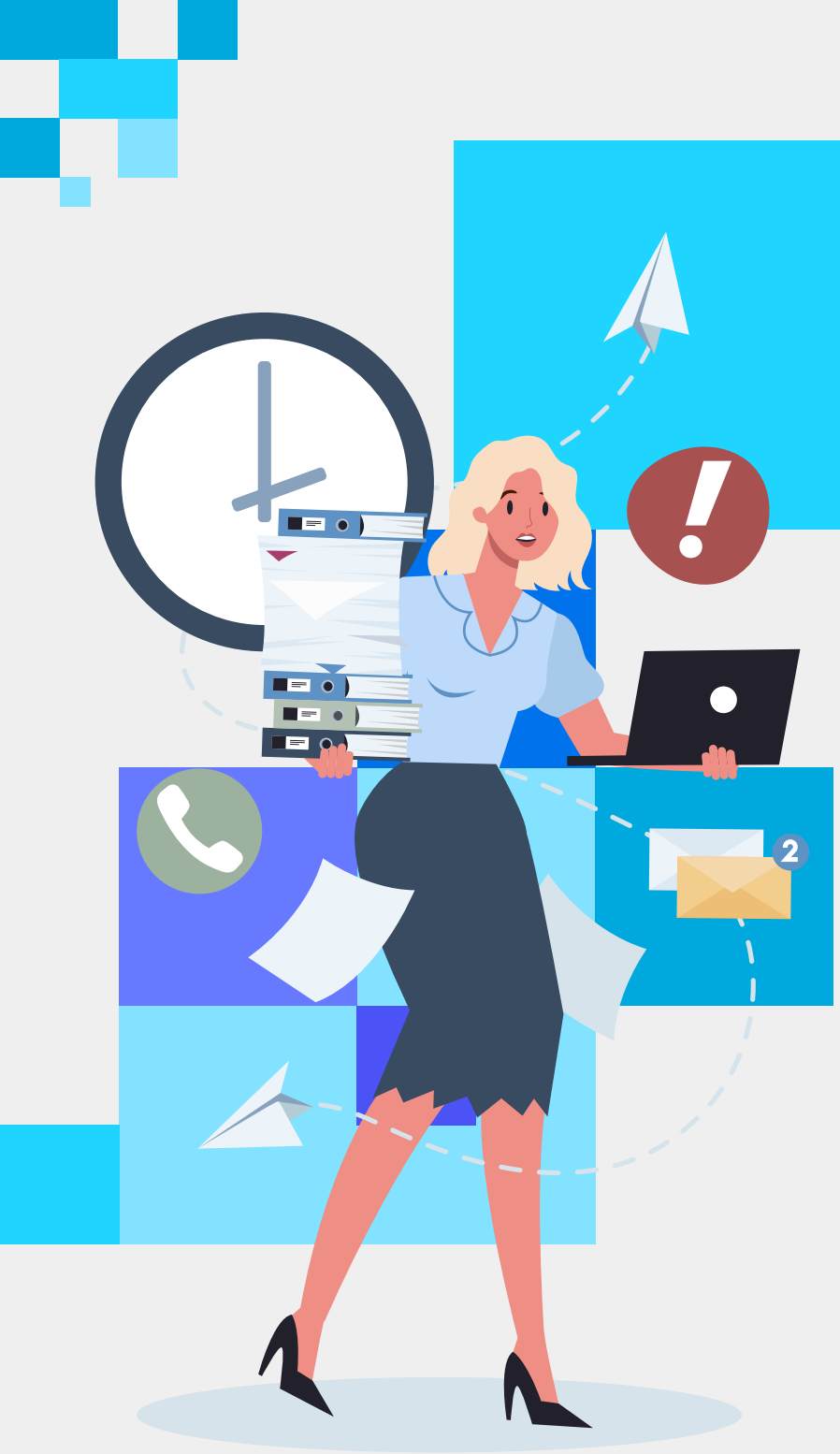
73%

report it's important to be able to print labels remotely to enable business operations

To ensure consistency and precision, they can also check accuracy by previewing labels and comparing label output from new locations to labels printed at previous locations.

Ensuring continuous operations

To prevent connectivity issues when there is an outage, shutdown, or supply chain disruption, labeling must be flexible enough to support new products, languages, regions, formats, shipping routes, uptime, and availability – and do so in a compliant and consistent manner. With cloud labeling, you have centralized access to manage label changes and ensure continuous operations quickly and easily. Also, disruption in warehousing or distribution or even closed facilities continue to create supply chain bottlenecks for companies across the

globe. However, with the cloud, users can quickly and easily shift labeling from one facility to another to meet production needs. This provides greater control, ensuring uptime and reducing risk.

Enabling suppliers is key

Allowing multiple locations and/or suppliers, as well as partners and 3PLs flexible access to centralized labeling and label content, to produce labels remotely is crucial to business continuity and supply chain agility. It eliminates the need for relabeling which helps to avoid slowdowns, disruptions, and errors. Furthermore, when companies extend labeling to suppliers, teams aren't faced with designing new templates, copying existing ones, or making updates. Instead, accurate

62%
said extending labeling to partners and suppliers enables them to avoid re-labeling
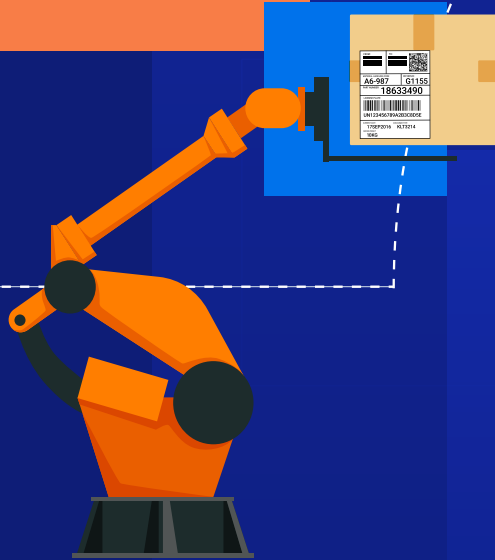
and compliant label templates can be accessed centrally from any location, avoiding the time needed to use the supplier labeling system to create labels that may or may not include the right content and format needed by the receiving company. Ultimately, extending to suppliers means they have the right label, they have it faster, and it is optimized for receiving by the company. It's also possible to offer role-based security that allows administrators to select what access to labels, content, and printing devices suppliers receive.
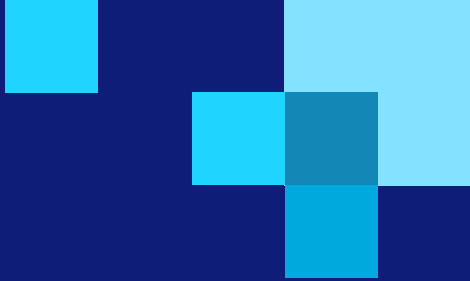
80%
experienced a direct impact on their business due to supply chain disruptions

TREND
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FROM: TO:
MATERIAL HANDLING CODE   REFERENCE
A6-987   G1155
PART NUMBER
18633490
LICENSE PLATE
UN123456789A2B3C8D5E
CURRENT DATE   CONTAINER TYPE
17SEP2016   KLT3214
GROSS WEIGHT
10KG

A6-987   G1155
18633490
UN123456789A2B3C8D5E
10KG   KLT3214

Increased desire for a "one solution prints all" standardized platform

- **More products, shorter runs and faster turnaround**

- **Leap forward in the automation journey**

- **Production line uptime**

There's an effort today to move beyond reaction to digital maturity. As part of this digital transformation journey, companies today are seeking an all-in-one labeling solution that can meet the full scope of their requirements for bringing products to market quickly, efficiently, and more competitively. Then there's increased demand to print on anything from hard or flexible plastic like a water bottle, to a foiled pouch or even a curved surface, or even wood. This has created a desire for a solution that offers integration capabilities to manage output for all devices from thermal label printers, to color inkjet and laser, coding and marking devices, visual inspection systems, serialization solutions, and more. Ultimately, these companies are looking for a "one solution prints all" standardized platform that reduces redundancies, increases efficiencies, and saves time and expense.

"Organizations are considering making the transition from manually operating each device to automating synchronization of print jobs and coding data to remove the "human element." This will involve integrating coding and marking solutions with their enterprise systems to enable seamless communication and data sharing for enhancing overall operational efficiencies." [4]

[4] VDC Research, Coding & Marking Automation Gaining Momentum – Varying Software-Centric Approaches Considered to Improve Accuracy and Consistency, Richa Gupta, 7/13/22

More products, shorter runs and faster turnaround

There has been increasing demand for more products, shorter production runs, faster turnaround, and increased customer requirements driving the evolution of the marking and coding space. But when it comes to marking and coding in an environment that typically is a heterogenous mix of print technologies, companies have struggled with managing errors, training users, and configuring lines using multiple systems. Traditionally, these businesses used purpose-built legacy software to control printing processes and the software was proprietary to the printer manufacturer and built to drive individual manufacturer's devices. This past approach is harder to integrate, creates challenges with consistency, and creates added delays in managing switchovers. However, managing and using multiple software packages proprietary to the device manufacturer is both difficult to manage and is also prone to error. Companies today want one user experience for coding and marking across production lines, warehouses, suppliers, and distribution – all the way across the supply chain.

69%

reported using multiple vendors for coding and marking at their plants/facilities

Leap forward in the automation journey

Coding and marking devices, generally found at plants and production facilities, typically have been driven as "closed-loop" systems. Devices are disconnected from enterprise applications, and processes are labor-intensive with limited automation controlling the workflow. This leaves operators to manually enter production related information such as expiration date, batch, and lot numbers. Of course, using multiple different devices all with separate software packages created significant issues. This approach leads to mislabeling due to manual entry and errors due to wrong codes lead to product rework, scrap or even recalls which result in significant costs. It also results in delays with extended

times to switch lines over to a different product or a new run. Although companies can now take advantage of more modern intelligent solutions that automate coding and marking across production lines irrespective of brand and technology. This type of solution offers integration capabilities and business rules which streamline user entry and leverage proper data to ensure accuracy. It also offers a more intuitive user interface where they can control every marking and coding device no matter what the requirements.

41%

reported errors driven by manual processes as one of the biggest challenges in their current coding and marking environment

Production line uptime

Production uptime and improved overall equipment effectiveness is very important on production or packaging lines. Downtime can be minimized by a centralized system properly orchestrating and managing all print devices on the line to assure correct job initialization and prevent unplanned interruptions during job runs. For instance, if a coding device runs out of ink during a job, it can stop the entire production or worse, result in inadequately coded products. Additionally simplifying the operator experience can shorten line changeover times and improve efficiency while also resulting in less training for the workforce on the shop floor. Best of breed integrated print automation platforms manage all print devices from one place, integrates with single sources of truth and offers an intuitive user interface for the operators to perform their jobs efficiently, without errors to boost productivity.
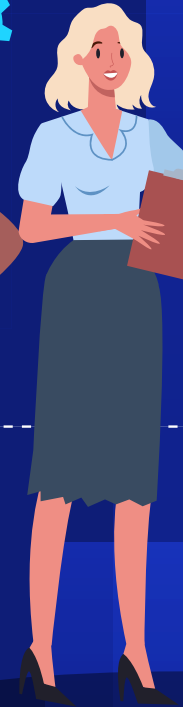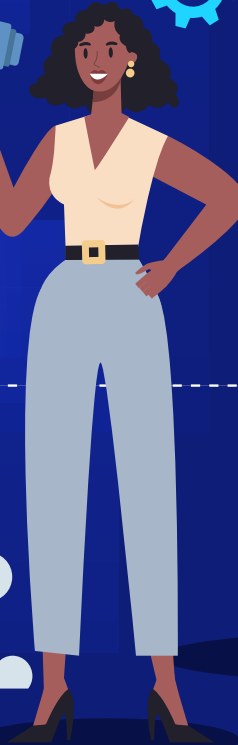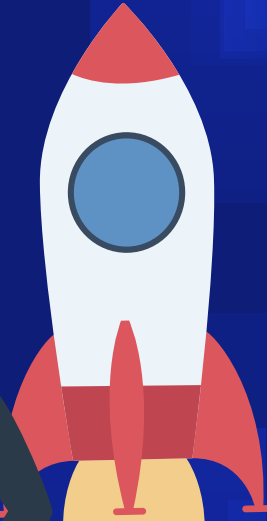
79%

believe a centralized and standardized approach to all output is the top benefit of implementing a unified system for labeling, direct marking, and coding
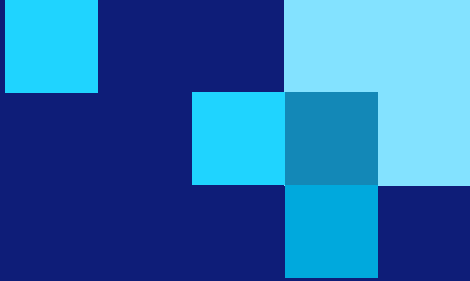
TREND

5

Companies adopt **composable business model** for agility and resiliency

- **Collaborative design for true autonomy**

- **Data-driven labeling to address digital orchestration**

- **Greater visibility and discovery for content management**

- **Modularity to address scale and control change**

It has become clear that to compete, companies today must be agile and resilient. This means they must be able to adapt to new circumstances and do so quickly. A composable business model is the key to digital transformation in all areas of business and is the future of labeling and artwork management. This model is intended to increase agility and accelerate application development by reusing existing assets and reassembling them in unique ways to satisfy specific user requirements. Today's cloud-based labeling and artwork management solutions help companies manage speed, agility, and modularity so they can embrace this new composable business approach.

"Rather than just keeping pace, leaders set the pace. Leading organizations will mark the 2020s as the era when they reinvented their business thinking to embrace change and accelerate their transition to digital business by applying the core principles of composability." [5]

[5] Gartner, Becoming Composable: A Gartner Trend Insight, Yefim Natis, Janelle Hill, Partha Iyengar, Gene Alvarez, Jennifer Loveland, Chris Howard, 01/12/2023

Collaborative design for true autonomy

When it comes to labeling and packaging artwork companies deal with a range of content from logos and symbols to transactional, regulatory, and customer-specific content. This often involves multiple stakeholders that contribute to the design and updates of the complete label or artwork. Although, an automated and configurable labeling and artwork management solution can offer control to varying stakeholder groups. This enables specific users to manage and modify a single part or component of a label. This approach to designing labels and artwork in a templatized fashion so that users can manage or modify specific elements is a cornerstone of composability. In addition to keeping the integrity of the complete label, this type of platform also streamlines workflow processes and enables digital review and approval cycles for packaging artwork. All these capabilities enable true agility and improves speed to market.

76%

have observed an increase in stakeholders involved in labeling functions in their business today

Data-driven labeling to address digital orchestration

Constant changes to customer and regulatory demands increase the need for agility. Companies are seriously challenged to support this demand for variation and dynamic data for both labeling and packaging. Without the ability to streamline label changes, companies are faced with missed delivery dates, hefty fines, lost revenues, and dissatisfied customers. However, a digital platform offering integration with multiple sources of truth - which is part of a composable business model - can help companies become more agile. This allows you to leverage accurate and consistent data anywhere at any time to populate labels and packaging artwork. This dynamic content can have business logic applied to update and modify labels – eliminating the need for hard coding and reducing the need for excessive label templates. This type of solution enables users to manage increasing requirements and manage label changes, so they can address complex variability in both labeling and packaging artwork quickly and easily.

93%
of respondents think it's important to have a business model that supports speed and agility in today's evolving business climate

89%

believe it would be beneficial to deploy labeling centrally

Greater visibility and discovery for content management

As the amount of content required for labeling and packaging artwork continues to increase significantly companies worry about visibility and management of vast amounts of variable content. Companies are looking to store, manage, and access all content from one common, centralized, and easily accessible location where they can search, identify, and utilize content, label formats, approval processes, and workflows. This type of streamlined approach allows organizations to track and secure any changes. Also, they can do so with confidence they're dealing with accurate, consistent data or the latest, most up-to-date version of labels or artwork. Content management is key to composable architecture, ensuring the right content elements necessary for labels and artwork are properly stored and maintained. Using an end-to-end cloud-based solution for labeling and packaging artwork allows companies to control all their content centrally to ensure compliance and enforce brand consistency.

Modularity to address scale and control change

Another benefit to adopting a composable business model is enabling companies to dynamically manage growth and expansion. Whether expanding into new regions, increasing print volumes, or manufacturing new products, companies must be able to extend labeling processes and workflows to enable all users access to accurate and consistent data. This allows them to adhere to corporate standards while working independently.

Breaking labeling and artwork down into specific components enables companies to scale, remove, add, and change their labeling with speed, accuracy, and control across a global landscape. The focus, even when deploying solutions in a distributed fashion, is to continue to maintain the ability to leverage common templates, data sources, content, and configurations across the enterprise. Rather than label and artwork updates taking weeks or even months to update a cloud-based labeling solution allows users to process changes in days or even hours. This kind of composable approach can be transformative, in enabling companies to scale labeling and Artwork Management across their enterprise.

74%

say they have had an increased need in the past few years to scale/extend labeling across their business environment

Loftware is the world's largest cloud-based Enterprise Labeling and Artwork Management provider, offering an end-to-end labeling solution platform for companies of all sizes. Maintaining a global presence with offices in the US, UK, Germany, Slovenia, China, and Singapore, Loftware boasts over 35 years of expertise in solving labeling challenges. We help companies improve accuracy, traceability and compliance while improving their labeling quality, speed, and efficiency. As the leading global provider of Enterprise Labeling and Artwork Management, along with Clinical Trials Labeling and Regulated Content Management, Loftware enables supply chain agility, supports evolving regulations, and optimizes business operations for a wide range of industries. Those include automotive, chemicals, consumer products, electronics, food & beverage, manufacturing, medical device, pharmaceuticals, retail, and apparel.

Loftware™