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Building a resilient supply chain

Your guide to building resilience into your supply chain

Contents

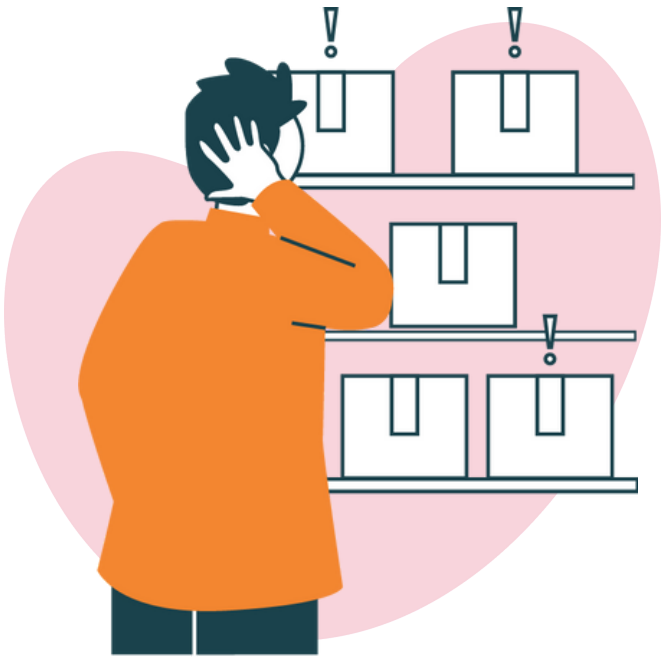
Introduction to supply chain resilience

Wherever your business sits in the supply chain, the past few years have seen unprecedented challenges. The COVID-19 pandemic wasn't the only cause of supply chain disruption. Coupled with the Brexit fall-out, raw material shortages, and shipping container and freight price-hikes, supply chain managers have faced exceptional obstacles.

External pressures, such as regulation and trade barriers, have intensified, customer segments have become more volatile with increased service demands, and multiple stakeholders are demanding action to promote sustainability.

Unfortunately, not much looks to change in the future. Many businesses are therefore focused on building a resilient supply chain.

In a 2020 Mckinsey survey, 93% of the global supply chain leaders asked planned to make resilient supply chain strategies a top priority for 2021 and beyond.



What is supply chain resilience?

Supply chain resilience means managing day-to-day risk and having systems and processes to adapt to disruption in the supply chain. Your business can absorb the additional stress, recover and, potentially, thrive – whatever the circumstances. With the right systems and processes, you can also forecast and anticipate disruptions, potentially avoiding them altogether.

“It’s not just about playing defence – it’s also about playing offence – finding competitive advantage by shaping a supply chain resilience strategy focused on disruption avoidance.”

Factors causing supply chain disruption

The coronavirus pandemic exposed significant global supply chain vulnerabilities, with national lockdowns and factory closures in major supplier locations, such as China.

The interdependency of the supply chain means that one problem can compromise the entire global network. And many things can go wrong.

We will below list some factors and how they can impact and cause supply chain disruptions.

Global health events

While COVID-19 may be a once-in-a-generation pandemic, it wasn't the first global health event and won't be the last. SARS in 2003, H1N1 flu in 2009 and Ebola in 2014 caused everything from capacity constraints and sky-high freight rates to material shortages and shipping delays.

Geopolitical events

Geopolitical events such as Brexit and the US-China trade war have impacted supply chain mobility. New border arrangements resulting from Brexit saw an increase in costs and paperwork, and the creation of the EU-UK Trade and Cooperation Agreement (TCA) set out new rules for trade following Brexit.

According to Heather Long at the Washington Post, the US-China trade war saw many American farmers go bankrupt, and the manufacturing sectors saw lows not seen since the last recession. Carnegie Endowment for International Peace found that manufacturers diverted their trade to suppliers from countries such as Vietnam and Taiwan.

They found ways to scale production in the short term, with long-term plans to relocate their factories and facilities.

Legislation and regulation

Each government will have its own supply chain legislation and regulations. For example, the UK's Modern Slavery Act (Transparency in Supply Chains) Regulations 2015, and Germany's Supply Chain Due Diligence Act, which will come into force in 2023.

There are packaging, safety, employment and environmental regulations, which could cause supply issues if they change.

Cyberattacks

CPO magazine says that supply chains have become a popular target for cyberhackers due to the level of access to the company‘s sensitive data. The recent hacking of food manufacturer KP led to considerable problems in their supply chain, disrupting manufacturing and shipping processes. Although KP had a cyber security response plan, they estimated they would face disruption from early February until the end of March 2022.

Natural disasters and climate events

Natural disasters, such as hurricanes, tornados, snowstorms, tsunamis, and volcanic eruptions, have led to port closures, cargo flight cancellations, and supply shortages.

As climate change becomes a reality, severe weather patterns are becoming more common. With increased extreme weather on seas, shipping container losses are becoming more frequent. The World Shipping Council estimated that between November 2020 and April 2021, nearly 3,000 containers were lost in the North Pacific in five separate incidents.

Given the many variables that can occur without warning, it’s imperative to develop adaptive strategies that consider supply chain resilience.

Why you should build resilience into your supply chain

Effective supply chain planning can reduce risk, lower the immediate impact of an external shock on performance and the bottom line and lead to faster and often greater, recovery.

A recent Gartner survey found that only 21% of respondents had a highly resilient network. More than half expected to be highly resilient within two to three years, with good visibility and the agility to shift sourcing, manufacturing, and distribution activities rapidly.

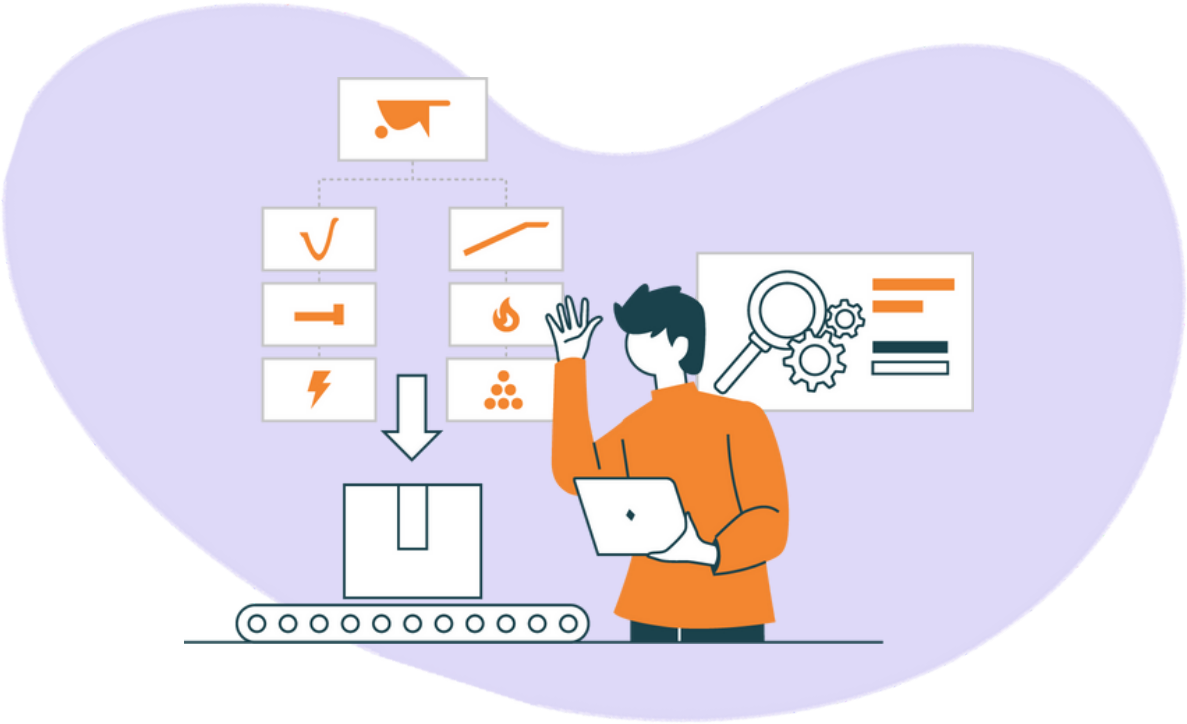
Bain and Company reported that companies that had prioritised investment in supply chain resilience had up to 60% shorter product development cycles and could expand their output capacity by up to 25%.

How to build a resilient supply chain

Before you can build a resilient supply chain, you need to understand your organisation and highlight any areas for improvement. Start by looking at how you have responded to previous supply chain issues.

- Where did disruption hit your company?
- What was your initial response?
- Did it work? If not, what did you do?
- If yes, did you make permanent changes?
- Is your supply chain adequate to meet current demands?
- Where are the most significant risks?

Once you understand your company's supply chain weaknesses and consequential issues, you can begin to plan how to prevent the same things from happening in the future.



Four critical areas for you to consider when building a resilient supply chain

01 **Inventory and capacity buffers**

02 **Supplier diversification, localisation or integration**

03 **Digitalising the supply chain**

04 **Just-in-case inventory management**

Inventory and capacity buffers

Companies have learnt the hard way over the past two years that for every Plan A, they need a Plan B, Plan C, and even Plan D in place so that they're never caught off guard.

There are many ways to build redundancy into supply chains; one of the most obvious is increasing capacity and adding redundancy into every stage.

One strategy is called Just-in-case and has come to grow more and more common in comparison with the Just-in-time strategy.

In the next paragraph, we will explain more about the difference between the two strategies. We will also show other strategies that aim to build capacity by preventing labour shortages and improving logistics planning.

Just-in-time to just-in-case inventory management

There is a growing and significant shift from a JIT to a JIC mentality. JIT was about holding the minimum amount of stock – just enough to cover demand – to lower stock investment. In contrast, JIC is where companies hold additional stock levels to cover the risk of supply delays or erratic surges in demand.

If you consider this approach, you need to be careful not to increase stock levels so high that you tie up capital in unnecessary stock. This can also lead to obsolete inventory that you either need to destroy or sell at a heavy discount.

Make sure you have good demand forecasting processes and a clear understanding of your lead times and supplier constraints to make informed stocking policy decisions. Check out our section on how to deliver a JIC strategy on page 23 of this guide.

Automation to support workforce shortages

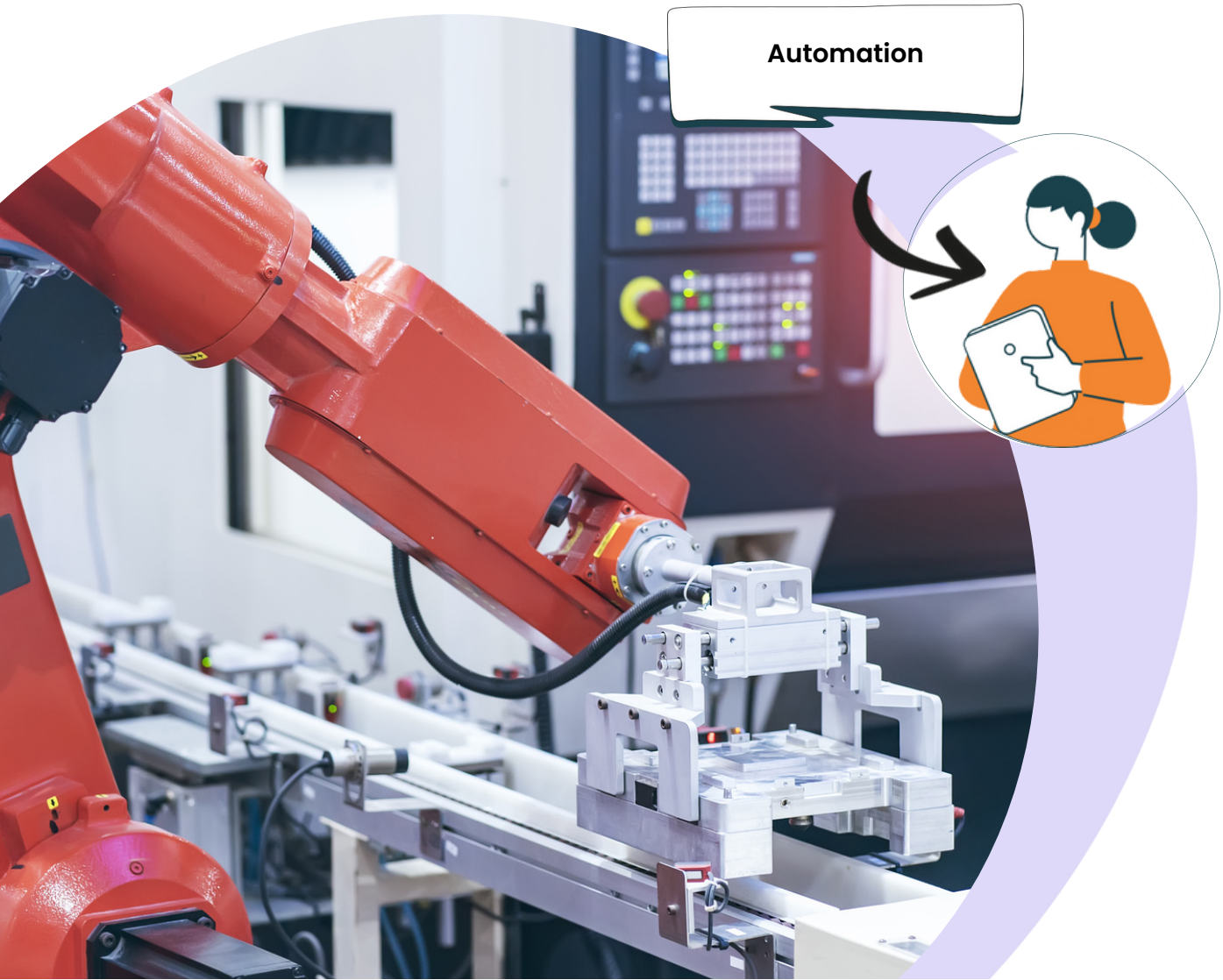
Many companies are looking to increase capacity around their workforce by introducing automation to aid productivity. This makes it easier to scale operations up and down when needed.

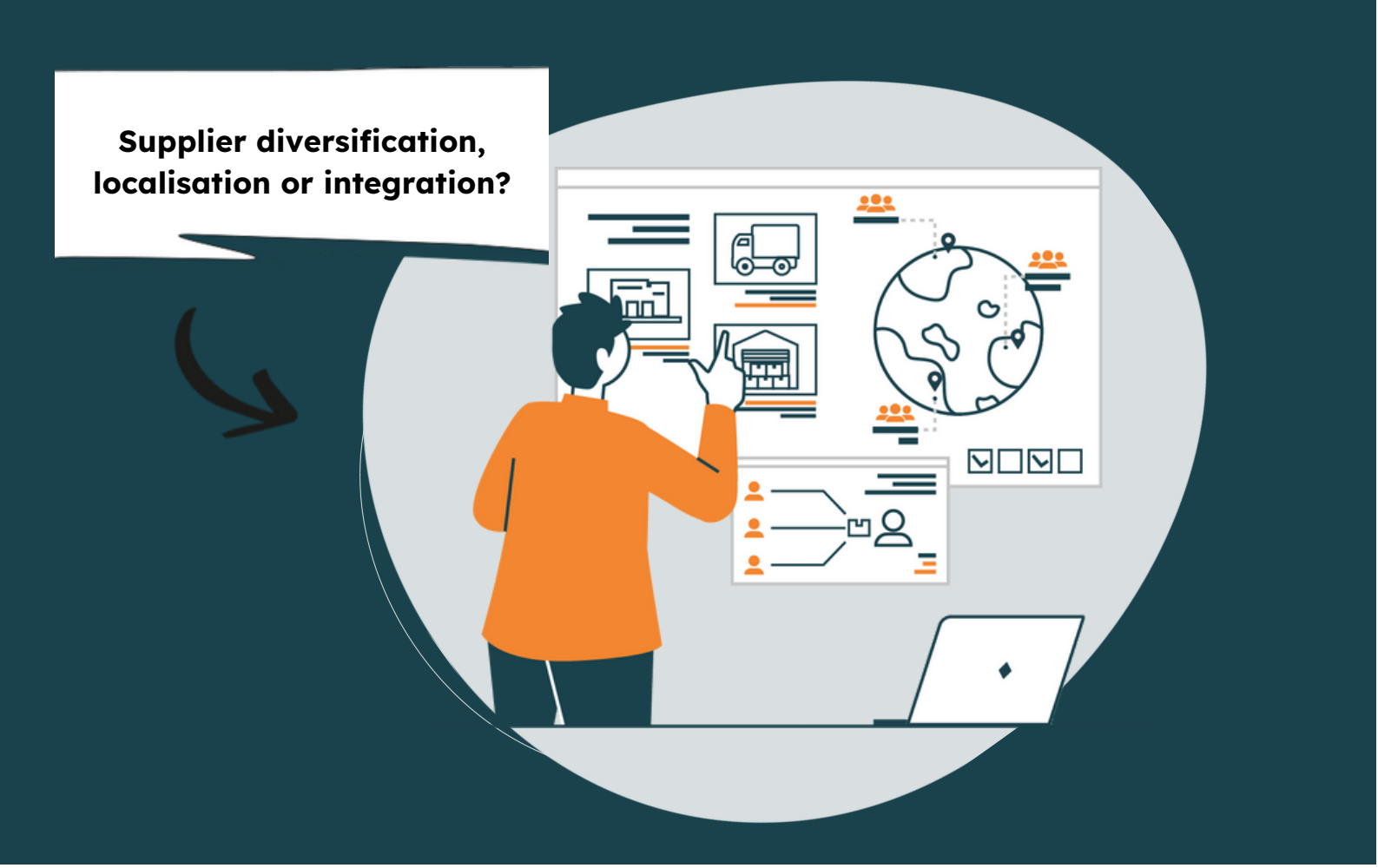
Improved logistics planning

There are many logistical challenges around moving items from suppliers to your premises and then out to customers, including increases in container prices and shortages in HGV drivers.

To help mitigate these risks, you must secure logistics capacity early and remain flexible with your transportation methods. If this means longer delivery lead times, factor these into your replenishment calculations.

Adding extra capacity to your supply chain will often come at a cost. Make sure you consider how these will affect your overall operational spend and take care not to introduce unnecessary complexity into your supply chain.





Supplier diversification, localisation or integration?

Suppliers are fundamental to ensuring you have the right stock to meet customer demand. Many businesses are reviewing their supplier network to highlight inefficiencies and ways to reduce supply disruption risks and consequential stock-outs.

Ensuring continuity of supply relies on excellent communication between you and your suppliers. It's critical that they share details around their current and future supply risks with you.

Understanding their reliance on their suppliers and working down each supply chain tier will also highlight potential bottlenecks.

Review your supplier network

Start by assessing how critical each supplier is to your business, and ensure you repeat this process regularly. Most importantly, look at the impact on your business if there's a disruption to their supply.

Other supplier assessment metrics include how much you spend with each supplier, whether orders arrive on time and complete, their cyber security protocols, financial situation, lead times, unit prices and minimum order quantities (MOQs).

If this review shows any red flags, or you find you heavily rely on one or two suppliers, it may be time to add contingency into your network to limit future disruption.

There are three main strategies to do this. The one you follow will depend on your business priorities and objectives.

Diversification

If you depend on one or two suppliers for particular items, along with your competitors, any problems significantly impact your business. Whoever has the strongest relationship or pays the highest price will usually get the goods first. And this is risky business!

Having multiple suppliers, also called dual- or multi-sourcing, who can provide the same goods will lower the risk of any supply chain disruption. It simply gives you more options.

For example, you can also use your metrics review criteria to compare suppliers based on any of the factors above to see which supplier is the most cost-effective or reliable, depending on your needs.

Another reason for diversification is to spread the risk of supply disruption over more regions or use suppliers who produce and ship from several locations. This can mitigate against an unexpected disruption in one area that could potentially impede or halt operations across an entire network.

Localisation

DW.com found that since the coronavirus pandemic, there has been an increase in businesses looking to nearshore or reshore their production and manufacturing facilities. Intel, General Motors and US Steel have all decided to build factories or source suppliers in the US rather than overseas; Lockheed, General Electric and Thermo Fisher are also considering reshoring activities.

When bringing new suppliers on board, consider their locations. Nearshoring your suppliers reduces geographic dependence on global networks and shortens shipping and delivery times. Although regional or local supply chains can be more expensive, they can provide more control over inventory and bring the product closer to you and the end consumer.

Integration

If you understand the transparency of your supply chain, integration is another way to get more control. It can help you avoid disruption, gain economies of scale and create a competitive advantage by bringing parts of the supply chain into your business.

Vertical and partial vertical integration occurs in industries where suppliers rely on other suppliers to purchase and deliver their goods, creating too many links. Businesses further down the supply chain are looking to gain efficiencies by ‘cutting out the middleman’ and dealing with those further upstream, for example, where raw materials are produced.

Startingbusiness.com highlights examples in the oil industry, where BP and Shell have adopted vertical integration through daughter companies, subsidiaries, and joint ventures. This provides tighter control over producing crude oil and transporting it to refineries for further processing.

It’s a similar story in car manufacturing, where large companies such as Toyota, Honda and Ford have their own key manufacturing hubs and global distribution channels.

Complete vertical integration can be expensive to set up, but it can lower costs in the long run. However, it can reduce your flexibility by limiting you to one supplier.

There are different scales of integration to help gain efficiencies, such as obtaining a stake in a supplier for preferential terms or signing long-term contracts to show your commitment to them.

Digitalising the supply chain

Supply chain digitalisation has been a buzzword over the past few years. Many companies have invested in digital business systems, such as modern enterprise resource planning (ERP) systems, warehouse automation, artificial intelligence and even blockchain.

Modern databases

The most resilient supply chains use systems that can process Big Data (large, complex, structured or unstructured data sets) and provide advanced analytics and real-time insights.

With a modern business system, you'll have real-time insights to increase stock visibility and streamline warehouse processes. It can also improve pick accuracy, warehouse flexibility, responsiveness, safety, security, and customer service.

Big data, advanced analytics and real-time insights combined with a modern ERP system and in-memory database can help you optimise your supply chain and improve its resilience.

Investing in the right software will empower your teams with the necessary data to perform more efficiently and make informed decisions.

Industrial Internet of Things

The step on from this is the Industrial Internet of Things. This is when all your devices, software and machines are connected using sensors and unique identifiers, such as Radio Frequency ID, allowing them to send and receive digital data. This data is then sent to the central software system – so there's one place to manage all aspects.

With such sophisticated systems, you can track inventory items moment by moment throughout the whole supply chain – from leaving the manufacturer to being on a cargo container, or HGV, into the warehouse and dispatch.

Artificial intelligence (AI), machine learning and digital twins

AI can analyse and interpret the most complex data to allow you to make quick decisions and automate workflows and processes across the supply chain. The deep procedural and operational insights AI can enable early detection of mistakes or issues to help reduce risk and avoid potential losses in the supply. In turn, this helps you optimise your inventory control, labour planning and customer experience, forecast risk and demand, and recommend business actions and responses.

Linking with AI, machine learning is helping businesses identify patterns and influential factors in their supply chain data. They can then respond quickly with the best possible workflows and operational strategies.

An example of this is the use of digital twins. Digital twins allow you to simulate the performance of an entire supply chain. You can then apply scenario-based planning to understand the impact of multiple potential risks in the future, for example, a surge in demand, a delay in stock from a specific supplier or any one of the issues we discussed earlier. They use 'smart' alerts to pinpoint which customers are likely to be affected by disruptions so that you can provide alternatives.

Warehouse technologies

Warehouse technologies are becoming more affordable and mainstream in enterprise and SME businesses.

One of the most common is using automated picking software and hardware. Picking systems remove the need to manually identify the best stock locations and the most efficient pick paths for your warehouse operatives. Systems such as pick-to-light or pick-to-voice speed up picking processes to improve warehouse efficiency.

We've already mentioned Radio Frequency ID (RFID). A warehouse management system based on RFID can help you collect, transfer, check, and update mass data on the location of your goods in real time, from entry to dispatch and delivery, reducing labour intensity and scanning errors.

Automated guided vehicles (AGV), such as smart forklifts and pallet carts, are increasingly used to move stock around the warehouse. They follow digital paths, loading and unloading items without the need for human drivers.

Robots and drones have various uses in warehouses. Robots can pick items, pack boxes, and transport goods around the warehouse. Drones can help move stock around the warehouse, with inventory audits and stock takes, counting and finding items. Both can adapt their processes, on-demand, to meet rapidly changing needs for speed, efficiency, and accuracy.

While these examples of automation might seem advanced and expensive, the availability of off-the-shelf solutions can make them much more affordable. With workforce shortages continuing, any technology that can reduce the need for manual labour could help reduce the risk of bottlenecks in warehouses.

Just-in-case inventory management

Adopting a JIC strategy allows you to carry more stock and add redundancy to your supply chain, so you can respond to unexpected surges in demand or mitigate supply disruption.

While increasing stock levels will increase carrying costs and tie up capital, it could still be more profitable in the long run. Having the right stock available could generate more sales and help you gain a competitive advantage. The ability to quickly respond to market changes also means you are in an excellent position to facilitate growth.

However, the biggest challenge with JIC inventory management is increasing stock capacity without tying up too much capital in unnecessary inventory items. This means you need to optimise your stock levels to be cost-effectively low and then use safety stock to meet unexpected demand or overcome supply disruption.

The key elements of inventory management to support your JIC stock strategy are:

Accurate demand forecasting

Use of safety stock

Stock classification

Stock-out anticipation

Ability to track excess stock to prevent obsolescence

Forecasting accuracy

Without a crystal ball to predict the future, it's critical to have a good demand forecasting engine to allow you to build resilience into your inventory levels.

This effectively means carrying stock that accurately reflects demand so you can decide how much extra you want to hold as a buffer. It also means you can continually analyse and adapt to the latest market conditions.

Factors to consider for accurate forecasting

The first step is to review the demand profiles of your stock items and consider where they sit in their product lifecycle. This is because an item has a different demand profile at each stage, affecting how you calculate its forecast.

Knowing each inventory item's demand profile or type will help you choose the best algorithms to calculate demand for the most accurate forecast.

Other factors to consider that will affect demand accuracy include:

- Demand trends (rising or falling over a sustained period)
- Seasonal demand (annual peaks and troughs),
- Promotions

You can then adjust forecasts accordingly. When markets are changing at a dramatic pace, it's essential to combine this data with qualitative insights. You will get some of the most up-to-date qualitative demand data from your sales teams, customers, and industry trade bodies. You can then use their input to fine-tune the numbers.

Check demand outliers

When demand is unpredictable, you may see more outliers, e.g., when actual demand is much higher or lower than the forecast.

Demand outliers can skew upcoming forecasts, so reviewing them and deciding whether to include them in your predictions is important.

Periods of stockouts

Make sure you remove periods when there were stockouts from your forecasts, as they will make them too low. Flag periods for exclusion, or if you can, make an assumption about the sales you lost and add this number into the forecast.

Consider all scenarios

Once you have your forecasts, it's essential to identify a plan A, B, and C in case of substantially higher or lower demand. These can include putting safety nets in place to help prevent stockouts or excess inventory. Setting up alerts for demand deviation can allow early implementation of your backup plans.

Share your demand forecasts or order projections with your suppliers, so they can clearly understand your requirements, e.g., what stock you need delivered and by when. If they can provide potential lead times, these can be added to make the prediction even more realistic.

In the worst-case scenario, you may need to look for alternative supply sources, ration current stock to last as long as possible, or prioritise orders for specific customers.

Calculating safety stock

Safety stock is a critical element of a just-in-case stock strategy, as carrying extra stock helps deal with supply chain disruptions or spikes in demand.

Safety stock is also critical to achieving stock availability targets, but it's essential to get safety stock levels accurate to avoid carrying unnecessary inventory.

It's important to understand that safety stock should be calculated in addition to your normal stock levels. Calculate usual or cycle stock based on your demand forecast, then add some contingency for unexpected changes in demand or supply.

There are many ways to calculate safety stock, from simply adding a fixed amount of buffer stock to all items to using statistical calculations that account for demand and lead time variance.

While more sophisticated models lead to more accurate safety stock levels, they also take time and resources to implement. In contrast, manual calculations are frozen in time and virtually impossible to implement at SKU level.

Whichever safety stock calculation you use, it's essential to test it carefully before final implementation. This is so you can ensure that it works correctly and analyse its impact on inventory levels and cash flow.

Stock classification

The number one rule to success with a just-in-case stock strategy is not to treat all items the same. Each item will have different demand patterns, which means some will be more at risk of erratic demand and lead times than others.

Classifying your stock using ABC analysis helps prevent a ‘blanket approach’ to categorising your stock items and assigning different stocking policies to each group. You can sort them into the most profitable or those most at risk of disruption.

For example, with your inventory split into three groups, you might decide to prioritise forecasting and carry more safety stock of your A items, as they have the most supply chain ‘risk’ and demand volatility than your B and then C items.

A more advanced approach would be to use pick classification. This identifies items that you pick and sell most frequently and ensures you use a JIC stock policy to improve availability, e.g., increase safety stock, include in a risk of run out report etc.

As an item’s pick frequency drops off, you can reduce the need for the JIC stocking policies to continue investing in the right stock.

Anticipating stock-outs

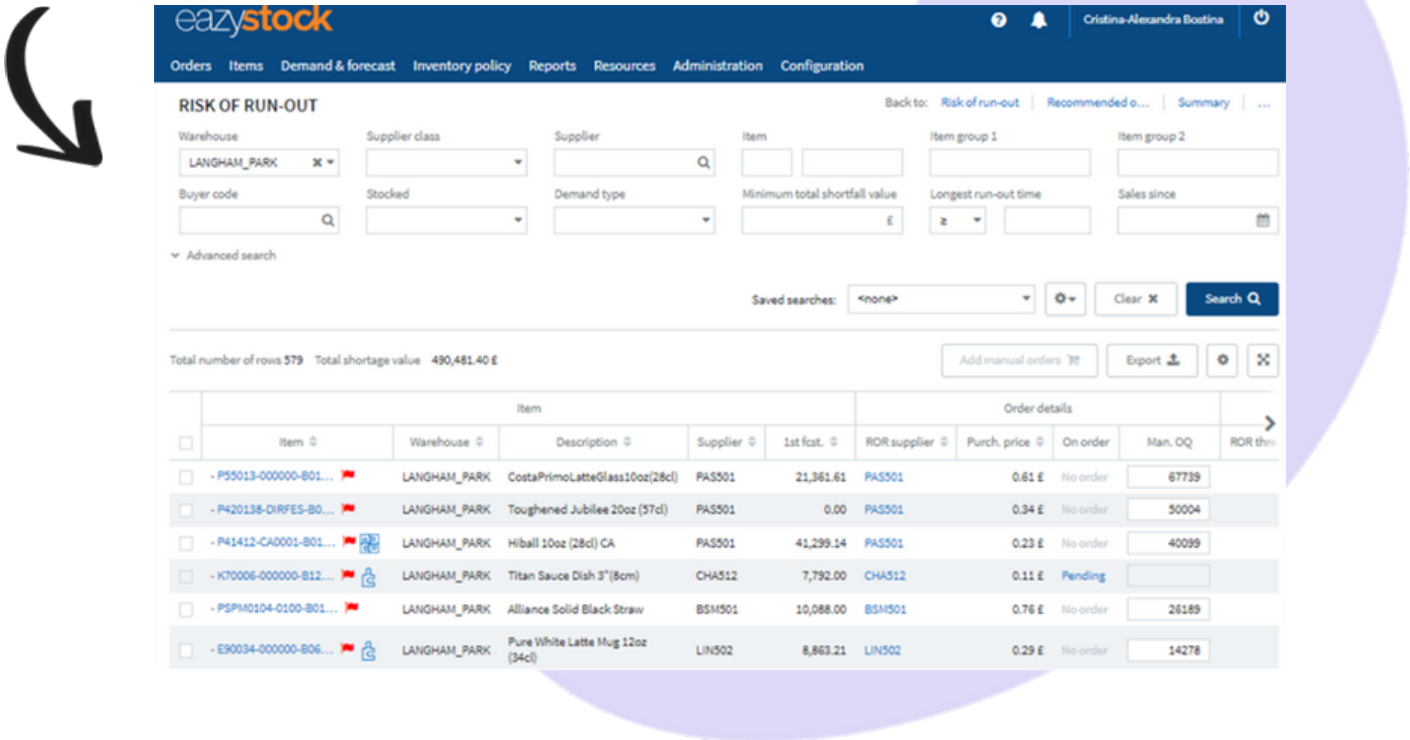
If you can ‘foresee’ potential upcoming stock shortages, you can act before there’s a stock out.

A risk-of-run-out report will help you understand what stock items are most ‘at risk’ of running out, when they are likely to run out, and how much you are likely to be short.

Although this is a reactive tactic, with this crucial information, your team can put a plan in place to deal with the consequences, e.g., organise an emergency order, communicate with the sales team, or redistribute stock.

You can easily set up a basic risk-of-run-out spreadsheet using data on current stock levels, items on order or in transit, demand forecasts and lead times.

EazyStock Risk of Run out



You can then work out:

- How many days of stock you have left until you run out
- The total number of days you will be out-of-stock (and the longest period, if required)
- The total amount of units you will have out-of-stock (and the largest quantity, if required).

However, such calculations are only helpful if you have accurate data on your current stock levels and forecasts. If demand is consistent, these calculations could be done once a week, maybe less. With more dynamic demand, they would need to be as often as possible.

The aim is to help your team understand their upcoming stock challenges and implement a plan to alleviate the issues. Although this process sounds time-consuming, you could choose to focus on your most critical or profitable items.

Preventing excess stock

A significant risk of using a just-in-case approach is that it could lead to excessive levels of stock that are difficult to move and that it ends up obsolete.

One way to prevent this is to track your stock's health. Your stock levels will reflect your demand forecasts if you have healthy stock. With a just-in-case policy, you may also have a pre-calculated additional level of safety stock that you may dip into now and again.

If you have excess stock, you'll have a lot of stock sitting on shelves going nowhere that is well over the quantities stipulated by your forecasts. It is essential to watch these levels, as inventory can perish, be superseded by newer models, or lose market value.

When a stock item has had no demand over several periods,it can be considered obsolete. At this point, items begin to affect your bottom line, so it's imperative to act before reaching this stage.

When you find you have excess stock, there are several strategies to prevent it from becoming obsolete. Firstly, you can look to run promotions or discounts. Secondly, if you have multiple sites, you can identify those with excess stock and move it to ones with lower levels to optimise your entire supply chain.

Identifying and utilising surplus stock also helps alleviate the pressure on supply and could be the difference between business continuity and grinding to a standstill.

Summary

To build resilience into your supply chain, you need to review your current systems and processes to highlight any areas for concern. You should look at:

- **Inventory and capacity buffers**
- **Reviewing your supplier network**
- **Digitalising the supply chain**
- **Just-in-case inventory management**

You can then identify the most appropriate methods and systemsto meet your business needs from this analysis.

While you might find your business facing increased costs due to implementing some of these strategies, it's important to remember that the cost of doing nothing could be more! When putting a business case together for implementing supply chain resilience strategies, it's important to:

Examine the costs you've already incurred due to previous supply chain disruption. Can you afford to incur them again should something similar happen?

Consider your suppliers. Are your competitors investing in supply chain resilience so they can respond to market changes faster? If so, will they gain a competitive advantage if you decide not to act?

Think about prioritising specific projects to spread the cost of building a resilient supply chain. Focus on areas where you can get the most bang for your buck.

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Learn more about automated inventory optimisation

Contact us