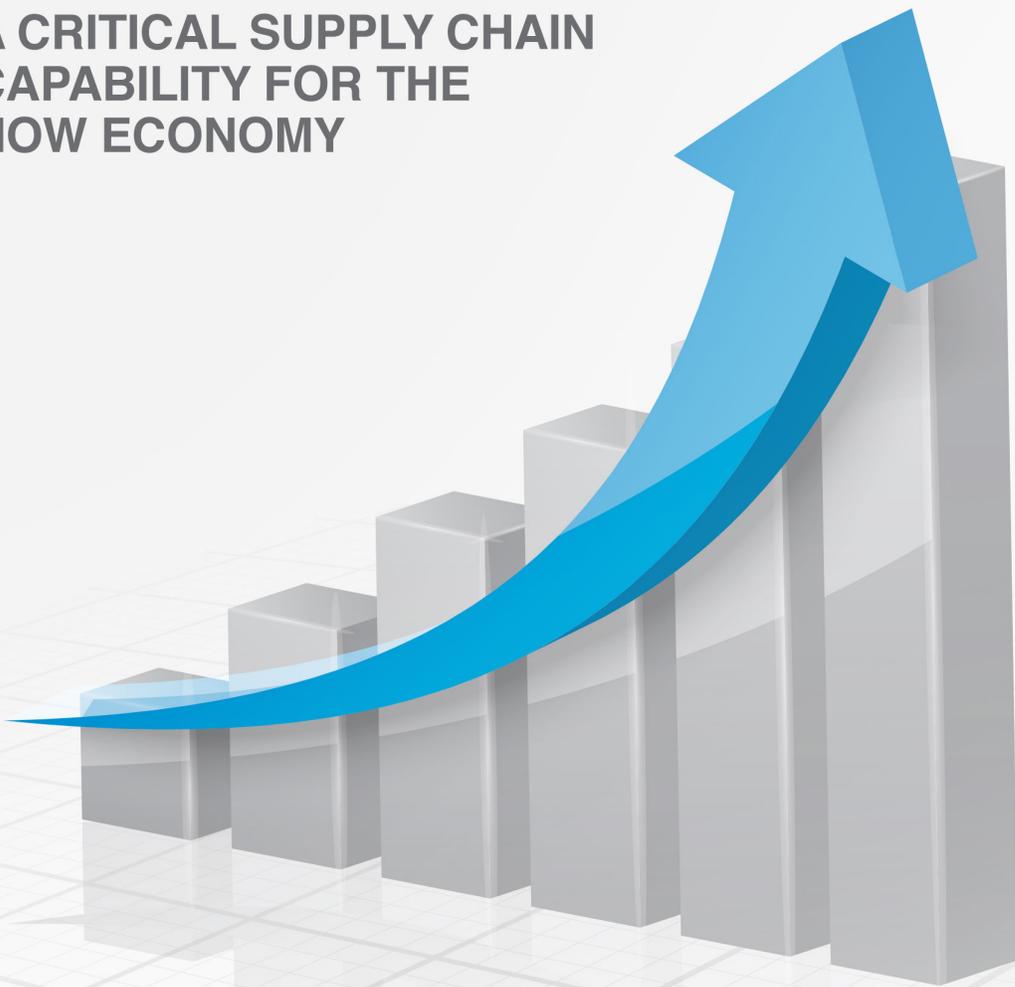


# DEMAND SENSING

A CRITICAL SUPPLY CHAIN  
CAPABILITY FOR THE  
NOW ECONOMY



## INTRODUCTION

# Companies that want to raise sales, reduce costs and free up working capital should invest time, money and resources in demand sensing

In the summer of 2018, a series of strange images began appearing on social media in the UK. Frustrated shoppers had begun posting photographs of empty shelves at stores run by four of the country's largest supermarket chains. Although the images had been taken across the UK, retailers insisted the stock-outs affected only a few stores. Unfortunately, the images being shared were more powerful than their reassuring words.

These circumstances were unusual, but not exceptional. Market researcher IHL has estimated that out-of-stocks cost traditional brick and mortar retail stores \$984bn across the world and \$144.9bn in North America. The company's survey found that 32% of shoppers had encountered empty shelves and 18% had not purchased an item because the price in store didn't match the price in an advert. Researchers estimated that "upwards of 24% of Amazon's current retail revenue comes from customers who first tried to buy the product in-store".

The retail sector often bears the brunt of such criticism because the failures in its supply chain are so conspicuous. Yet the struggle to forecast and meet demand transcends industries and markets. Many companies are now seeking to manage this challenge using an approach known as demand sensing, which uses new mathematical techniques and real-time data to

accurately predict short-term demand, based on what is really going on in an organisation's supply chain.

Demand sensing has its roots in demand forecasting, which has been with us since the first modern supply chains were established after the Industrial Revolution, between 1760 and 1840. Traditionally, such forecasting was a relatively ▶



**Many companies are using demand sensing, which uses mathematical techniques and real-time data to predict short-term demands**



## INTRODUCTION cont'd



◀ long-term affair – credible estimates suggest that, at some multinationals in the pharmaceutical sector, it can take four to five months for a change in demand at a local subsidiary to reach the plant producing the drugs. As supply chains evolved into networks and, more recently, into ecosystems which contain more vendors and embrace many widespread locations, such supply chain cycles are becoming increasingly untenable. Realising they need to act faster to remain competitive, many companies have turned to demand sensing.

In recent decades, the time-consuming labour of building increasingly complex and/or bespoke statistical models has achieved incremental improvements in accuracy. Technology has also stepped into the breach but, even so, many chief supply chain officers feel they are getting too little

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**Many managers have had to settle for macro-level monitoring, while relying on their judgement to handle fluctuations in demand**

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useful information out of their ERP system (as we discussed in a previous white paper) and find themselves relying on instinct and experience. Many managers have had to settle for macro-level monitoring, while relying on their own experience and judgement to handle the hourly, daily and monthly fluctuations in demand.

## WHY IS DEMAND SENSING SO IMPORTANT?

As the market becomes ever more volatile, uncertain, complex and ambiguous, and as customer expectations – in the consumer and business sector – change radically, this blend of models, instinct and experience is no longer fit for purpose. One obvious problem is that this approach effectively relies on history repeating itself. Chief supply chain officers could create a truer, more actionable picture using mathematics, technology and real-time data to improve their ability to sense demand and, crucially, fulfil it.

Why is demand sensing so important? Because, like it or not, we live in an age of instant gratification. Let's say a celebrity is photographed wearing a stylish green hat at a red-carpet event. They post their image on their social media feed – and the next thing you know this hat is sold out everywhere – at retail stores, online marketplaces and even at the fashion brand itself. That creates several months of back orders and a significant missed opportunity for everyone in the supply chain – from

the label, to retailers (online and brick and mortar) and trucking companies.

“If you can't meet the immediate demand, you run the risk of alienating your customers and losing a substantial amount of revenue,” says Eric Wilson, general manager of supply chain and technology services at GEP, a leading global provider of procurement and supply chain strategy and software. “If you disappoint customers you effectively damage the brand, so you may lose revenue in the longer term too. On the upside, if you do satisfy demand in such situations, you can create a wave of positive momentum that will increase revenue and enhance your reputation and your brand.”

For millennial and Generation Z consumers, buying a product on Amazon and having it delivered two hours later is not exceptional, it is routine. Fashion brand Zara's supply chain, which aims to go from design to store in 10-15 days, was described by the ▶



**For millennial and Gen Z consumers, buying a product on Amazon and having it delivered two hours later is not exceptional, it is routine**



## WHY IS DEMAND SENSING SO IMPORTANT? cont'd

◀ *New York Times* as “mind-numbingly supersonic”. Yet that kind of timeline is one that companies increasingly aspire to achieve.

Today’s consumers are more fickle than ever. Marketing agency Nielsen has declared that “disloyalty is the new black” after a survey in which only 8% of global consumers identified themselves as “brand loyalists” and 46% said they were more likely to try new or different brands than they were



**Lean manufacturing has shortened delivery times. Some companies have begun fining suppliers that don't meet specific delivery windows**



five years ago. In some markets – most notably apparel, entertainment and smartphones – product lifecycles are becoming too short for companies to correct a forecasting error.

Attitudes are also changing significantly in the B2B sector. Lean manufacturing has shortened delivery times. Some companies, most notably Walmart, have begun fining suppliers that don't meet specific, and often narrowly defined, delivery windows. Customer-supplier relationships are less enduring than they used to be: a recent survey by market research agency B2B estimates that companies will lose 45-50% of their customers every five years.



## EVERY ADVANTAGE COUNTS



**W**e are conducting business in a marketplace where technology is blurring or erasing the boundaries between sectors, creating opportunities for disruptive innovators to challenge traditional incumbents and creating a business environment in which the divide between winners – the first and second in a market – and losers – almost everyone else – grows starker every year. In such a marketplace, CEOs, CFOs, CPOs and CSCOs need to seize every competitive advantage they can find, which is why more companies are investing in demand sensing.

“If you can sense demand accurately, you can increase revenue, reduce costs, shorten lead times and, by managing your inventory more efficiently, have much greater control of your working capital,” says Wilson. Sportswear giant Nike has halved its

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**C-suite leaders need to seize every competitive advantage they can find, which is why more companies are investing in demand sensing**

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lead times through a demand sensing approach founded on four core principles: integrating its warehouse management system with other supply chain systems, collecting real-time data from all operations and disciplines, selecting vendors and suppliers that support demand sensing, and working with them to collect data and make product replenishment as fast and efficient as ▶

## EVERY ADVANTAGE COUNTS cont'd

possible. The company discovered that, by sensing demand more accurately, it improved its margins because it was selling more products at full price and less at a discount.

Although the concept of demand sensing has been discussed for more than 15 years, it has taken a while to rise up the corporate agenda. In part this is because some companies have been so tied into their existing IT infrastructure – particularly their expensive, cumbersome ERP systems – that they feel obliged to persevere with what they have, even if that involves make-dos, workarounds and compromises on functionality. “You don’t have to abandon your existing technical infrastructure overnight,” says Wilson. “You can start small with demand sensing. You need to understand what data you have and what data could affect demand. We recommend introducing it to an individual area – it could be a product or a part of the business, such as stores in a particular territory – where you have data, test it, refine it, evaluate it against what you do already, get proof of concept and build on that success.” That way, chief supply chain officers can reduce the initial spend, lower the risk, stay agile and accumulate the evidence to prove the return on investment to other stakeholders.

A side-by-side test, which puts the analytics against human forecasters’ results, may assuage those loathe to put their faith in automated

systems. “As humans, we simply do not have the bandwidth to process the volume of data required to plan demand for today’s supply chains – machines do,” says Wilson.

The complete digital transformation of the company and its supply chain remains a worthy goal – but a modular, step-by-step approach may ultimately be more successful than the kind of sweeping statements of intent that have preceded such corporate initiatives in the past.



**A side-by-side test – the analytics against human forecasters’ results – may assuage those loathe to put their faith in automated systems**



## IT'S TIME TO TRUST THE TECHNOLOGY



A cluster of advanced technologies – particularly AI, machine learning, robotics, the Internet of Things (IoT) and cloud computing – can help companies acquire, analyse and share the data that will help them make better, faster decisions. To achieve that, Wilson says, they need to rethink their approach to data. “One of the biggest challenges with demand sensing in the past was the way organisations managed its data. Too often, it was siloed in warehouses, not shared with many of the people and departments that needed to see it, and sometimes had not even been entered into the ERP system,” he says. “We believe that organisations that aim to excel at demand sensing need to think of a ‘data lake’ where real-time data can be easily and quickly accessed by any relevant stakeholder.”

Technologically savvy companies can exponentially expand the amount of data they use when sensing demand. In essence, demand sensing relies on four kinds of data: structured internal data (for example,

e-commerce sales), unstructured internal data (for example, IoT data from an app), structured external data (such as weather patterns and oil prices), and unstructured external data (such as social media sentiment). With these technologies, chief supply chain officers can assess the impact of a competitor’s new product, political unrest in a country where manufacturing is located and the celebrity’s attention-catching green headgear. They can also avoid the problem of “garbage in, garbage out” because the system evaluates the data in real-time, filtering out the noise so that managers can focus on the signal.

Instead of being content with a macro-level forecast, organisations can model demand at the most basic, granular level. It is possible, for example, for demand to be made visible at a cluster of stores in a particular area or at a key account. By transforming the level of supply chain visibility, managers can detect, explore and resolve issues they may never have known existed. ▶

## IT'S TIME TO TRUST THE TECHNOLOGY cont'd

External variables can be costly for company supply chains. The Times journalist Paul Simon notes, in his book *Weird Weather*: “The temperature range can be crucial. At precisely 68 degrees Fahrenheit (20 degrees Centigrade), British motorway service stations sell 70% fewer hot meals. One catering company lost £70,000 [\$91,000] a day in wasted hot meals when the temperature rose above that threshold.” In 2019, PepsiCo began using demand sensing in its digital supply chain, creating a model that analysed weather, promotions, consumer behaviour and market shifts and reduced the level of error in near-term forecasts (which the company defines as 0-6 weeks).

If you're an ice cream company, and you know there is a heatwave coming, you really shouldn't be running out of ice cream. Often, the problem is not that the company cannot sense demand, it is that the supply chain is not flexible, dynamic, connected or efficient enough to respond to the new information in time. “It's not enough to sense the demand,” says Wilson, “you need to be able to take the data and act on it, in real-time, with hardly any manual intervention.”

Even while digital transformation is a work in progress, the organisation's demand planning will become more accurate. Machine learning and human input will improve the algorithms you use and make your supply chain more responsive to demand. This task cannot be accomplished by technology alone – you will need to own or be able to access the requisite data science skills and to drive a certain amount of cultural change – but it cannot be done without technology.

Demand sensing has already been adopted by many companies in the consumer and retail sector, especially by businesses with large sales volumes. It is also increasingly prevalent in other sectors – notably aerospace, automotive, energy, industrial products and pharmaceuticals. “With digital transformation topping the agenda for so many companies, we can see a time when demand sensing will be standard practice,” says Wilson. The plain truth is that companies which ignore demand sensing's potential to increase sales, reduce costs and free up capital will find it so much harder to compete with those which are reaping those rewards.

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## QUESTIONS TO ASK

- 1 What data do we have?
- 2 How is that data used and accessed?
- 3 How accurate have our historic forecasts been?
- 4 When was the last time we underestimated demand and why?
- 5 When was the last time we overestimated demand and why?
- 6 What external factors have impacted demand in the past?
- 7 What external factors might impact demand in the future?
- 8 How visible is our supply chain?
- 9 What is the typical throughput time in our supply chain?
- 10 How connected is our supply chain?
- 11 How digital is our organisation at present?
- 12 How digital will our organisation be five years from now?





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