

Part 2 of 3 - Artificial Intelligence in action: revolutionising supply chain business processes

In second of this three-part series, we examine how Artificial Intelligence (AI) is truly reshaping supply chains. We explore emerging applications and learning from industry leaders who are championing this transformative technology.

Industry



Logistics & Distribution



Retail & FMCG

Services



Architecture



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Organisational Design



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Sourcing



Artificial Intelligence in action: revolutionising supply chain business processes

Smart, efficient, and robust processes are the beating heart of any supply chain. AI's growth is already changing the game. It has the potential to revolutionise the future supply chain model by improving efficiency, accuracy and profitability, driven by factors including increasing data availability and insights, ever more powerful computing platforms, and the industry's recognition of AI's potential benefits.

From predictive analytics to robotic automation, AI encompasses various applications, each with its own unique contributions to make in the commercial world. Machine learning algorithms enable intelligent data analysis and forecasting, while natural language processing facilitates efficient communication and interaction. Computer vision technology empowers visual recognition and object detection, while robotic process automation streamlines repetitive tasks.

By harnessing these AI technologies, businesses can unlock new levels of productivity, agility, and competitiveness in their supply chain operations. Core areas and processes are being re-imagined, as we see in the following areas:

Innovation, new product development (NPD) and route to market strategy

Innovation and strategy are evolving through increasingly rapid and informed decision-making processes. Production is being streamlined with the integration of advanced technologies and automation, offering new and exciting ways to approach all manner of retail tactics, from personalisation and tailoring to rapid prototyping and market insights. [Proctor & Gamble \(P&G\)](#), for example, are using generative AI to create new products, reduce development time through modelling and simulation and tailor brand messaging.

This is game-changing for the industry.

By accelerating product development and route to market, competition will be fiercer than ever before amongst brands that are applying creative, effect use cases.

Demand planning and forecasting

A crucial part of efficient supply chains is demand management. Loss of sales through stock shortages is a perennial issue for retailers globally. Forecasting and demand management traverses many different challenges, can be heavily impacted by unforeseen disruption, and requires the evaluation of many different and complex scenarios.

Relying on stock piling has long been a key response to protection against the pitfalls of various siloed data sources for forecasting and the struggle to properly plan for demand spikes. The use of AI in these spaces provides more accurate predictions, accelerates order fulfilment through integrated systems and technology-driven solutions, and ultimately reduces burden, cost, and wastage. In short, AI provides opportunities for substantial demand management wins.

A great example of successful implementation can be seen at [Walmart](#). They implemented an AI-powered demand planning system that helped the company to reduce out-of-stock rate through key events including Black Friday, ensuring that inventory levels were balanced across their distribution network. This and other high profile use cases demonstrate the power of AI to revolutionise a fundamental industry process that, until now, has depended on costly manual intervention.

Production and manufacturing

As expected, AI is being used to transform production and manufacturing cycles through optimisation, predictive maintenance, and quality control. AI can analyse production data, identify bottlenecks,

and ensure consistent productivity. By monitoring real-time data from sensors and machines, AI algorithms can recommend – and even adjust – parameters such as machine settings, production schedules, and workflow layouts.

AI-powered robots and automated systems can perform repetitive and labour-intensive manufacturing tasks, increase efficiency, reduce human error and free human workers to focus on more complex strategic activities. [Siemens](#), for example, is using AI to adjust the production of wind turbines, helping them to increase efficiency by 10% and the bottom-line by 20%.

AI can also monitor equipment performance and historical maintenance records, detecting potential failures and scheduling maintenance activities. This reduces unplanned downtime, optimises maintenance schedules, and extends the lifespan of equipment. AI enhances quality control by automatically inspecting products using computer vision and machine learning algorithms – ensuring consistency and safeguarding quality standards.

An exciting example is [GE Aviation's application](#). By using AI to predict when aircraft parts will fail, the company can proactively replace parts before failure, mitigating business-critical risks and driving valuable cost savings. Moving forwards, this level of insight across the product life-cycle will be paramount to continued brand advantage through longevity and trust.

Warehousing, logistics and distribution

Across industry, AI's greatest power is through analysis – of historical data, demand forecasts, and real-time sales data to manage inventory levels. Using AI to improve accuracy and reduce costs can, and will, generate huge market shifts. Having the right inventory levels in the right place at

the right time is central to supply chain success. Any imbalance in this stream will quickly drive-up receipt, handling and despatch (RH&D) fees and transportation costs, working against driving savings and also sustainability targets. Not to mention the risk of increased service failure when operations are forced to shift beyond their usual sphere of delivery. Repeated and sustained instances like this will inevitably harm key performance metrics and negatively impact customer satisfaction.

What's more, AI-powered systems can streamline order picking routes and strategies. By considering factors including order priorities, item locations, and pick density, AI algorithms can generate improved pick lists and route instructions for staff or robots alike. By considering factors including traffic conditions, delivery time windows, and vehicle capacities, AI algorithms can generate optimal delivery routes – reducing fuel consumption, improving delivery efficiency, and lowering costs.

Trustworthy, reliable, and real-time tracking has long been the key to unlocking operational efficiency and service excellence in any supply chain. AI-powered tracking systems and digital twins can combine and analyse large volumes of data from various sources – GPS trackers, RFID tags, sensors, and connected devices, to name a few. By consolidating and interpreting this data in real-time, AI enables logistics companies to gain accurate and up-to-date visibility into the location, condition, and status of shipments.

Reducing the need for returns

Having a robust returns management policy and underlying process has become a critical issue for many companies. Today's consumers can return products with unprecedented ease. That's great for customer experience and loyalty, but can have concerning impacts for retailers, not only for the environment (as we discussed in our first article), but also financially.

According to a study conducted by [Klarna](#), 78% of UK consumers are more likely to purchase from an

organisation offering free returns policies. Fashion giant [Asos](#) has reported profitability impacts as a result of increased return rates to pre-pandemic levels. Although industry has significantly improved the returns life cycle for customers, has this swung too far? Or are retailers at risk of unacceptable cost and sustainability impact if they continue down this road?

AI can help to mitigate such risk, particularly within fashion, by reducing the need for returns in the first instance by ensuring the right selection of products, as well as optimising the sub-processes involved in returns. Inbound [Logistics Magazine](#) highlights the role of AI in powering virtual fitting rooms, customer profiles and preferences, as well as intelligent chatbots, which use purchase data and questions to direct the customer to the right product the first time.

Preventing online fraud activity

For today's retailers, online fraud poses more significant challenges than were ever possible in bricks and mortar operations. It causes financial loss, serious reputational damage, and regulatory and compliance risk – and this landscape will only become more complex.

According to [Amazon's Brand Protection Report](#), continued investment in machine learning and AI algorithms has enabled the retail giant to analyse vast amounts of data to identify patterns, detect suspicious behaviours, and prevent fraud across various aspects of its platform, including transactions, customer accounts, and seller activities. With the right, targeted AI transformation strategy and roadmap, there is no reason why even smaller retailers cannot follow suit.

The integration of AI technologies is paving the way for smarter, more agile, and increasingly competitive supply chains but, to truly unlock its power, we must first focus on securing the underlying technology pillars of data quality, security, and human collaboration.

That focus should be urgent. Advances that seemed unimaginable

in the not-so-distant past are already becoming embedded in the retail ecosystem. In the same way, emerging innovations like virtual and augmented reality will quickly become the norm. In an industry as fast-moving and competitive as retail, the reality is that not keeping up is simply not an option.



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