

How digital automation is shaping modern supply chains

WRITTEN BY
WILL GIRLING



MAX. GROSS 32 500 KG
71 650 LBS
TARE 2 850 KG
6 280 LBS

MAX. PAYLOAD 29 650 KG
65 370 LBS
CUBE 32,1 M³
1 132 CUFT

Since the COVID-19 pandemic has illustrated the need for further automation of supply chains, what role will AI and ML play in the transformation?

The effect of the COVID-19 pandemic in relation to supply chains can be measured by an accelerated interest in automation, particularly with regard to AI (artificial intelligence) and ML (machine learning). The current fragility of global supply chains, the necessity for end-to-end transparency and the availability of digital technology to rectify the situation has created an exciting surge of companies exploring new applications and possibilities. With chatbots for customer enquiries, ML-powered analytic for planning and forecasting, self-driving vehicles and software to target and streamline chain inefficiencies prevailing as trending utilisations of automation technology, the logistics sector of tomorrow may hinge on companies' ability to strike a fluid human-robot balance.

DEFINING AI AND ML

Despite operating along similar principles, both AI and ML have distinct functions which differentiate and are specialised for certain tasks:





AI – Implemented within an existing system, AI is computer science aimed at training machines to carry out tasks normally performed by humans. The ultimate goal, therefore, is to enable machines to match or even outperform humans on a given task.

“The logistics sector of tomorrow may hinge on companies’ ability to strike a fluid human-robot balance”

—
Alec McPherson,
Director at Manhattan Associates.

AI DIFFERENTIATORS:

1. It is programmed to enhance successful outcomes, although this does not necessarily mean a focus on accuracy.
2. The software is sophisticated and can carry out more complex or ‘smart’ tasks.
3. AI is capable of actively making decisions.
4. AI will search for the best solution possible.

ML – By comparison, ML’s functions are relatively simpler and less proactive than AI. Programmed with an algorithm designed to optimise an input-output pathway through experiential trial and error, ML is useful for drawing inferences from

large pools of data which would be unmanageable if analysed manually.

ML DIFFERENTIATORS:

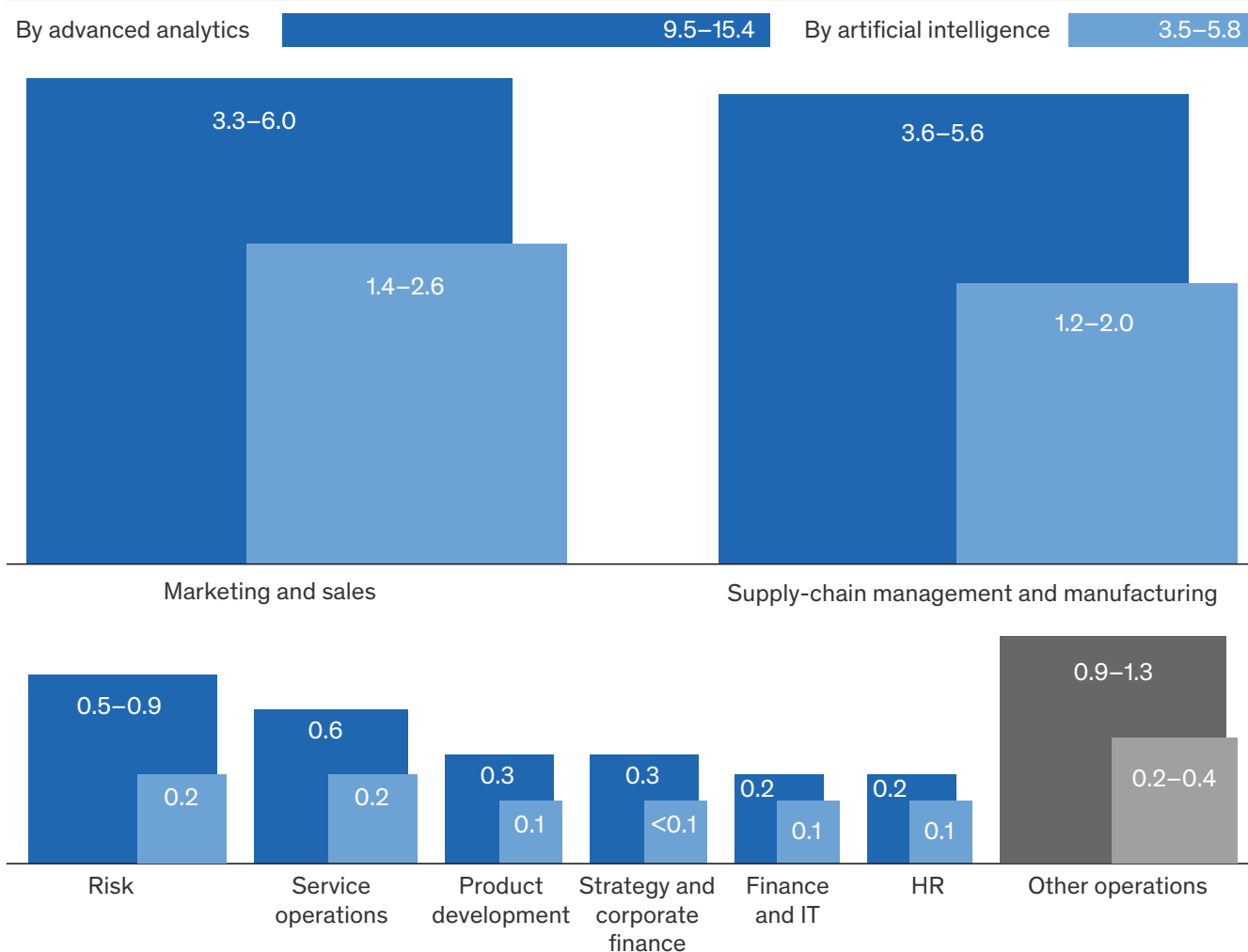
1. Its aim is to streamline the accuracy of a process pathway through a self-improving algorithm.
2. ML conducts prescriptive tasks and will not deviate.
3. ML unlocks the value of ‘dark data’.
4. The ML process will determine what the patterns in data indicate, although this will not necessarily be inherently useful or valuable.

TRENDING APPLICATIONS WITHIN SUPPLY CHAINS

Some of the popular uses for automation and unlocking value via analytics in supply chains include:

Planning and forecasting – With supply chains incorporating more end-to-end digital technology, companies are now able to take a holistic view of processes via collected data. ML algorithms can be programmed to analyse statistics, factor in historical and environmental information and then produce insights into patterns or trends.

Artificial intelligence’s impact is likely to be most substantial in marketing and sales as well as supply-chain management and manufacturing, based on our use cases.



Note: Figures may not sum to 100%, because of rounding.

Source: McKinsey Global Institute analysis

Warehouse and stock management – The possibilities of AI-based automation within warehouses are extensive. From mechanical arms that can sort, select and handle cargo to software capable of

calculating daily stock movements and even automated cleaning robots programmed to work in dynamic environments, AI facilitates the fast-paced changes required by supply chains.

Chatbots – Able to mitigate large volumes of customer enquiries in a qualitative manner, AI chatbots can be an invaluable resource for liberating employees from routine or repetitive duties and refocusing them on more client-centric tasks. Furthermore, chatbot automation in operational procurement can be highly effective for streamlining invoice generation and helping buyers secure fast approval and easy payment.

Self-driving vehicles – Although still in the nascent stages of development,

self-driving vehicles have the potential to dramatically transform modern supply chains. AI systems fed a constant stream of data in real-time using cutting-edge network technology, such as 5G, will give vehicles the autonomy to make road-based decisions that factor in traffic, weather conditions and terrain challenges.

MCKINSEY

In McKinsey's insight '[Supply Chain 4.0: Opportunities to use your supply chain for differentiation](#)', the



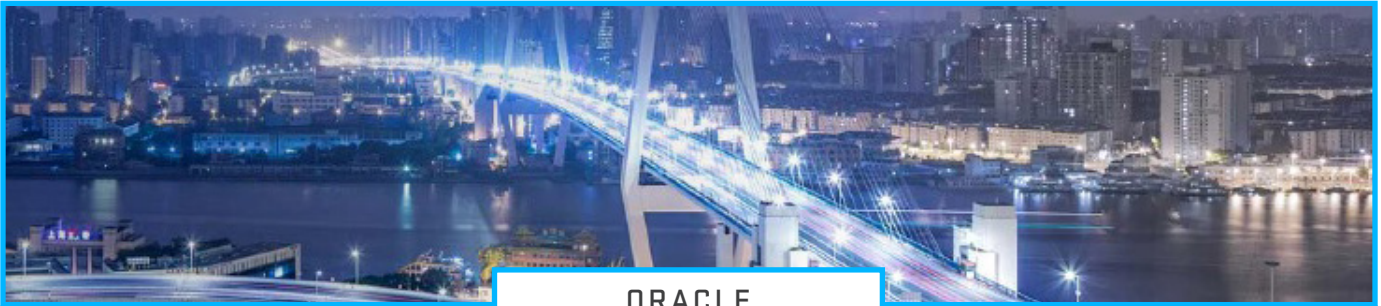


consultancy lists ML-powered forecasting through advanced analytics among its choice methods for unlocking value in a modern supply chain.

Its research postulates that a 12% overall increase in forecasting accuracy is possible when ML algorithms are used in conjunction with enterprise data, with brand and pack errors reduced by 66%. This improvement can be attributed to the high volumes of historical, situational and environmental data factored together to produce a coherent report, thus allowing supply chain managers to make more informed decisions. Additionally,

McKinsey notes that a European non-food retailer was able to achieve a 15% saving on operational costs by automating its warehouses, yet without incurring a reduction in service levels.

In a further examination – [‘Most of AI’s business uses will be in two areas’](#) Michael Chui, et al, estimated that AI could yield between US\$3.5trn and \$5.8trn in additional value across multiple sectors. Amongst those expected to gain the most are supply chain management and marketing and sales, which cover 66% of the opportunity collectively (\$1.2trn to \$2trn potential value for supply chain).



ORACLE

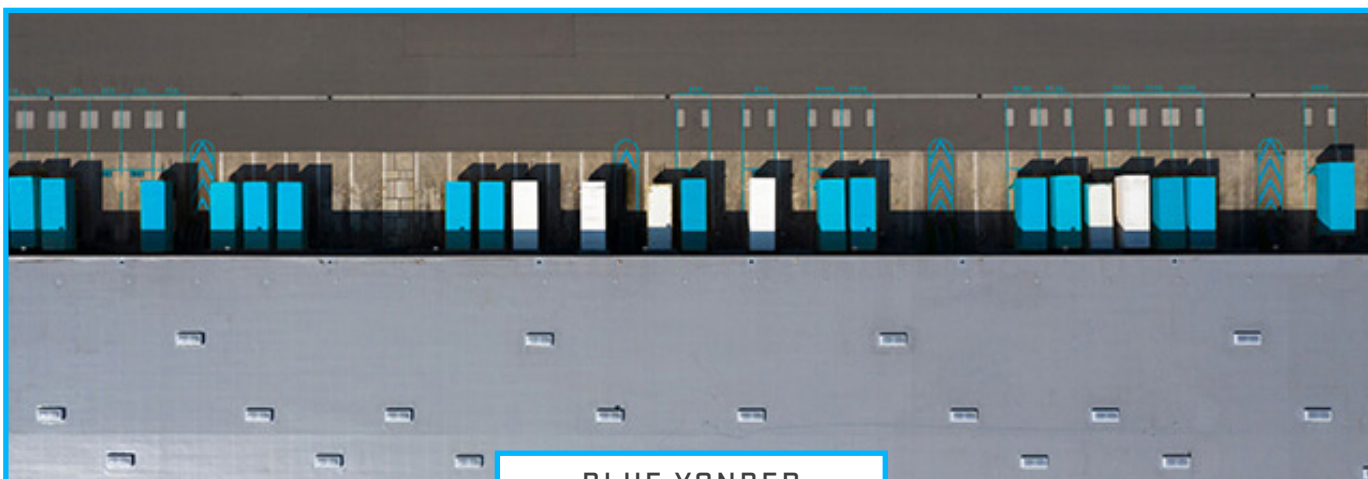
[Dominic Regan](#) is a Senior Director for [Oracle](#)'s logistics applications across EMEA. Working closely with its product development and strategy teams in his current role, he's been involved with supply chain since the mid 1980s:

“A lot of the technological solutions for supply chains were built for traditional operations, not the global, flexible supply we need today. Despite AI adoption increasing, many companies still lack an end-to-end view and will often view the supply chain in silos, causing them to be slow to discover and react to issues and adapt to change.

“To overcome this, businesses must introduce greater transparency from end to end. Doing so requires the implementation of technologies such

as AI. These can, for example, monitor demand at a very granular level across multiple tiers of the supply chain, enabling operational planning both within the company itself as well as with trading partners. Leveraging this intelligence enables the necessary operational agility to quickly re-prioritise inventory in order to meet shifting customer demand or adjust to external impacts.

“Moving forward, we can expect the expansion of both AI as well as machine learning in the supply chain. This can enable manufacturing and supply chain managers to track and manage day-to-day production, while leading to data-driven operations that will significantly improve production yield, product quality, lead times, equipment, and labour efficiencies.”



BLUE YONDER

[Wayne Snyder](#) is VP of Industry Retail Strategy EMEA at world leading supply chain platform [Blue Yonder](#):

“AI makes automation a much more realistic prospect within warehouse management. Warehouse material handling processes tend to be focused on flexibility, scalability and process adaptability; AI can drive these to the next level, increasing productivity with improving the level of user adoption. AI is also pushing warehouse inventory management to the next level, with AI tools making it possible to understand the relationships between internal data sets to enable businesses to forecast dynamically, continually and

automatically by learning the true drivers of demand.

“The warehouse of the future must be continual and dynamic, and understand real-time issues to respond accordingly. What happens if deliveries are late? What happens if the yard is full of deliveries waiting for unloading? AI allows you to use real-time analytics to understand priorities and schedule activities accordingly in the most effective manner to meet business objectives. This can make warehouses more efficient than ever before, enabling businesses to make decisions based on item, location and day.”



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MANHATTAN ASSOCIATES

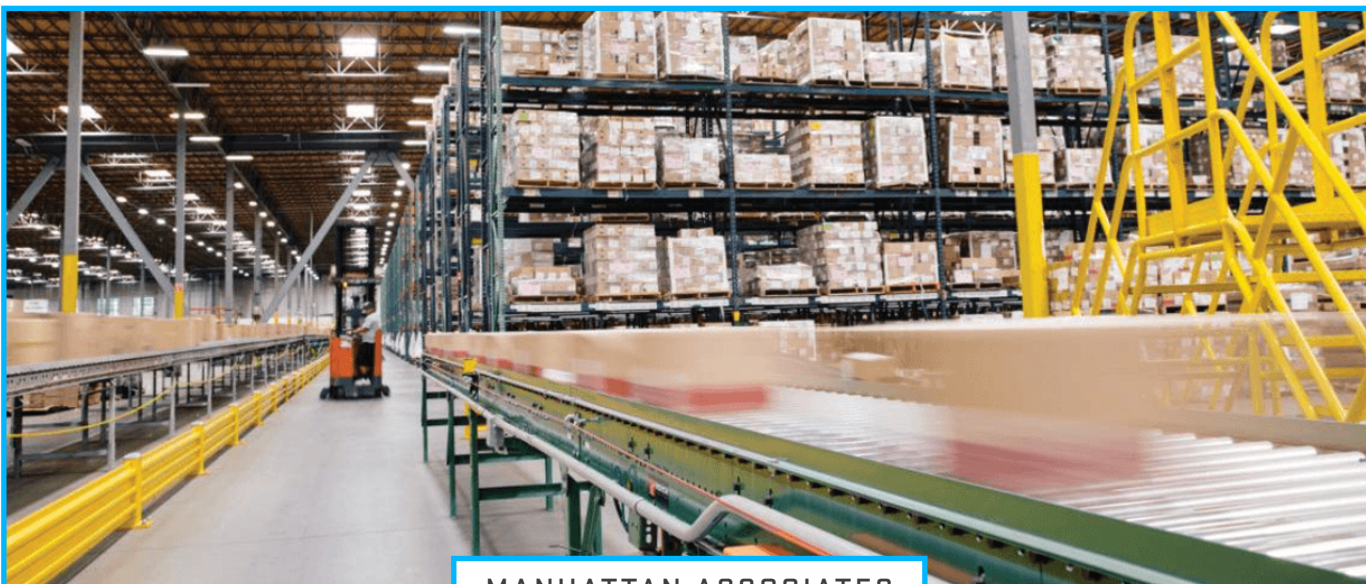
An article from Manhattan Associates (MA) titled '[Building a smarter supply chain for eCommerce](#)' explores the exciting possibilities that come from digital innovations. In particular, MA examines how same-day delivery capabilities have made flexibility, speed and breadth of reach the new metrics for success.

Global eCommerce sales are projected to grow 265% to \$4.9trn by 2021. Better planning, smarter analysis and more accurate forecasting are all

“AI could unlock \$1.2trn to \$2trn of potential value for supply chain management”

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part of that; AI and ML are the keys to unlocking large streams of value from vast amounts of collected data (estimated to be 2.5 quintillion bytes per day by MA).



MANHATTAN ASSOCIATES

[Alex MacPherson](#) is a Director at [Manhattan Associates](#). Not only does the company offer a range of [supply chain solutions](#), but MacPherson is also an expert in warehouse management systems:

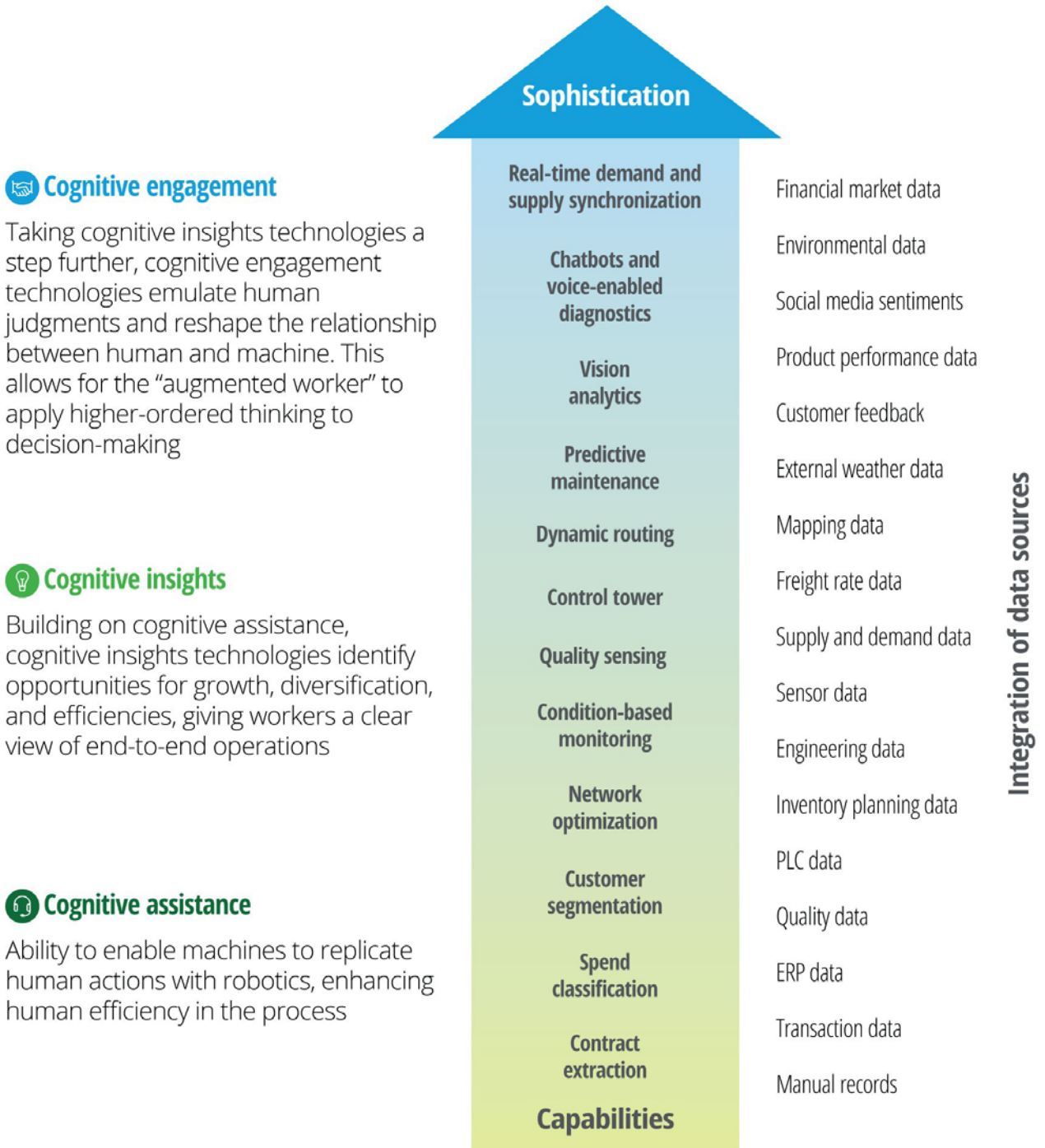
“Today’s warehouses and DCs (distribution centres) need to ensure flexibility, scalability and reduced reliance on temporary or unreliable labour pools to meet their operational requirements.”

“With the use of robotics and automated processes within warehouses and DCs, retailers can process eCommerce orders far more quickly and safely,

rather than relying purely on manual pickers. By strategically implementing automation and robotics, supply chains can work around the clock without having to delay deliveries, while still staying true to customer expectations.”

“Within a warehouse, however, it is still necessary to complement automation with human employees to perform certain tasks that robots are simply not yet able to do. Move further along the supply chain to the delivery end and it’s a different picture, with last-mile delivery having been transformed in the last five years.”

The continuum of cognitive automation within the digital supply network



“Same-day delivery capabilities have made flexibility, speed and breadth of reach the new metrics for success”

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DELOITTE

Deloitte points out that, while 76% of respondents to its [Deloitte 2019 Supply Chain and Digital Analytics Survey](#) agreed that AI and ML investment was crucial to their overall strategy, only 44% invest at least \$5mn into developing it.

This disparity is only emphasised by the organisation's '[Building a cognitive digital supply network](#)' article, which extolls the virtues of a balanced human-robot workforce by breaking down the augmentations of automation into three categories:

- Cognitive assistance
- Cognitive insights
- Cognitive engagement

The first two focus on the more 'mechanical' aspects of automation (process assistance and data analytics). RPA (robotic process automation) – described [here](#) by Deloitte – is an example of this: software observes and 'learns' repeatable patterns of behaviour by observing a computerised task performed by a person, which the software can then replicate.

The third aspect, however, manifests a more 'cerebral' or 'smart' form. AI robots programmed to recognise and emulate human interaction with logic and nuance (chatbots) can be invaluable for operational procurement by giving customers fast, intelligent solutions to common enquiries (invoicing, payment, approval, etc).

THE HACKETT GROUP

We spoke with Nicolas Walden, Senior Director at management consultancy [The Hackett Group](#), on the topic of automated vehicles and their contemporary deployment in supply chains:

"Mining companies, such as [Rio Tinto](#) and [BHP Billington](#), have really been investing in this area by automating the trucks and heavy equipment they use," he says. "It can drive a lot of value – not just in terms of saving costs, but also by reducing the necessary frequency of vehicle maintenance and increasing the standards of health and safety."

However, Walden clarifies, it isn't just this aspect of logistics or type of vehicles that could be enhanced by AI: cars, vans and even trains can be included. As 5G becomes

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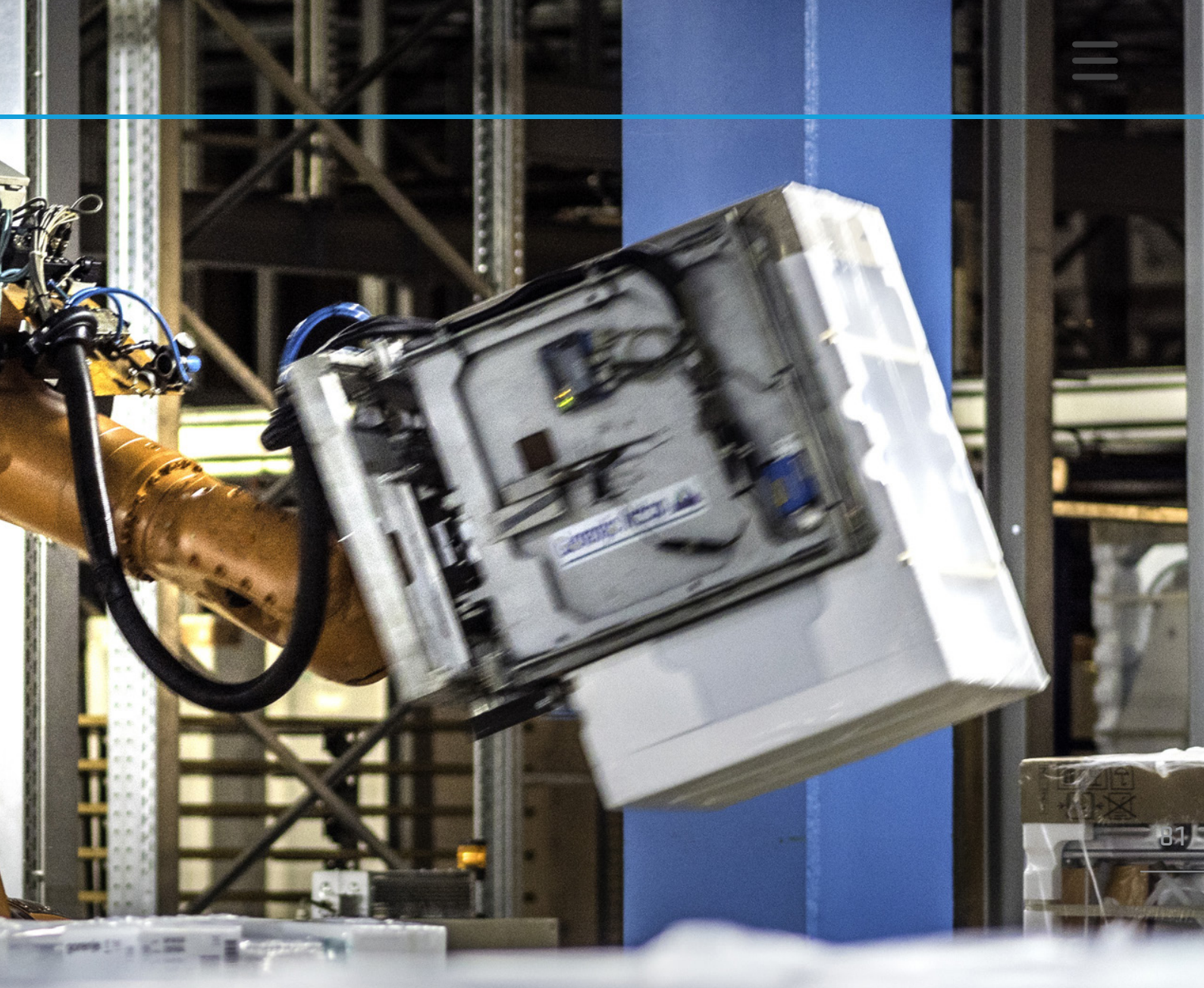


THE HACKETT GROUP

[Nicholas Walden](#) is Senior Director of Procurement Executive Advisory Membership Programmes at The Hackett Group.

Having gained two degrees from Victoria University of Wellington (in Accounting & Economics and Law), he began a career in commercial finance and business consultation.

Possessing decades of cumulative experience gained at prestigious companies in the tech and consultancy spheres, Walden helps clients – all global industry leaders – to reach their potential through world-class performance insights, metrics, research and networking.



commonplace and network connection speeds accelerate rapidly, the mapping accuracies of autonomous vehicles and AI software's ability to make real-time decisions will make a significant difference to delivery consistency.

“At the moment, autonomous vehicles have been successful when they stay within strict operating parameters,” Walden continues. “When they're taken outside of those

‘comfort zones’, there's so much complexity that manufacturers often struggle to keep up technologically. However, that's the level supply chain solutions will need to eventually be operating at.” Concluding, Walden states that, although R&D of AI-driven vehicles appears to have been slowed down by COVID-19, the potential for innovation is still present in the market and should be monitored carefully.