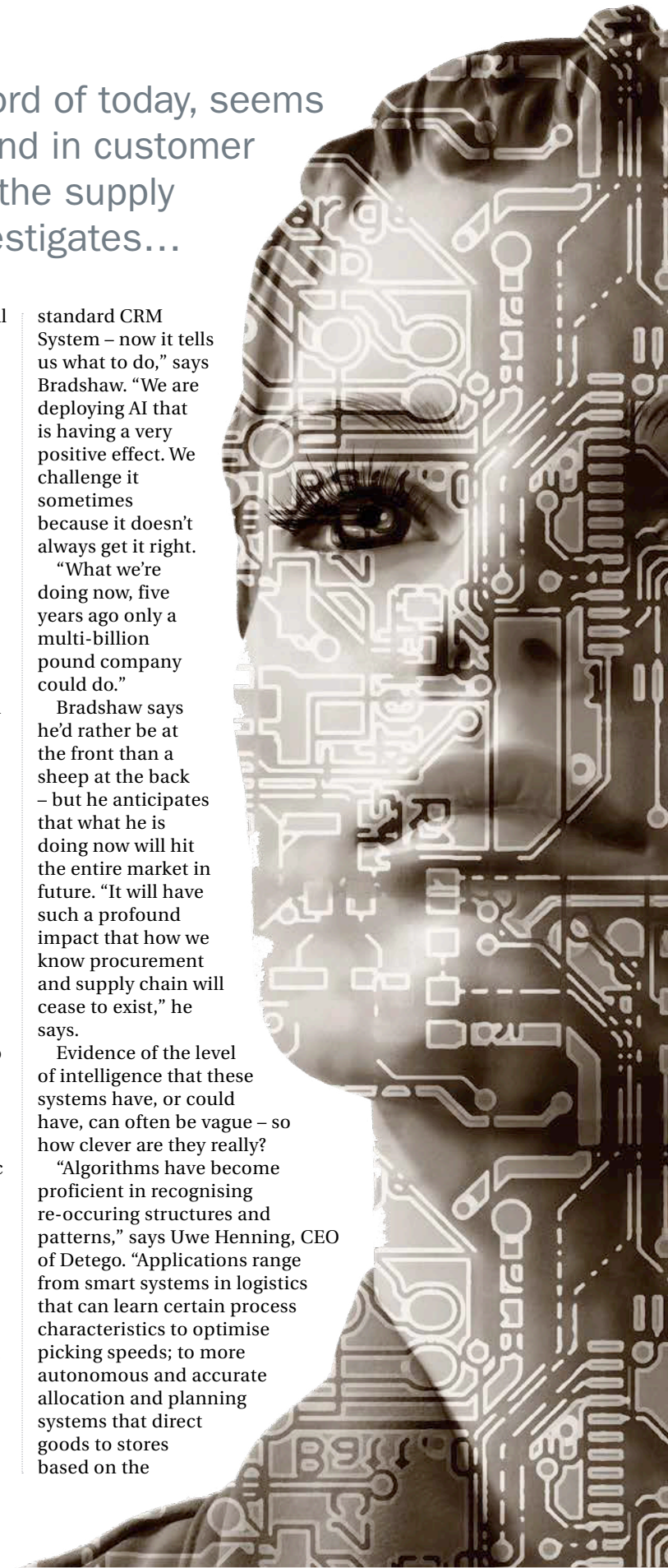
Beyond the armour

Artificial intelligence, the buzzword of today, seems to be finding its footing online and in customer service – but what can it do for the supply chain? **Alexandra Leonards** investigates…



Lacking the cold, metal shell of a material robot, artificial intelligence lives beyond the armour of reality. Out of physical reach and enigmatic, AI can be far harder to understand than other technologies and concepts. However perplexing it is, with the UK government spending a share of £270 million and conducting a major review on a "booming" AI and robotics sector, there cannot be any doubt about how important it is for our present as well as our future.

With the help of the internet, AI has crept into the customer service market. Algorithms are now being used to monitor troubling comments on Facebook, and Google Brain, the multinational's AI project, is using the same to de-blur pixelated images.

Research company Gartner predicts that applied AI and advanced machine learning, intelligent apps and intelligent things (intelligence applied to robots, drones and autonomous vehicles), will be some of the biggest trends this year. But when Dame Wendy Hall, professor of computer science at the University of Southampton, and CEO of BenevolentTech Jérôme Pesenti conduct a government commissioned review to see how the technology could thrive in the UK, will they think of supply chain? They certainly should.

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>
> **Charlie Bradshaw**

According to Charlie Bradshaw, CEO of product design, procurement and supply chain company Matrix, AI has already slowly started to be incorporated into the supply chain at a basic level. The logistics process, which he describes as incredibly efficient now, is heavily reliant on software which is already delivering a certain level of intelligence. It can identify how much space is on a vessel or in a van, and provide payment systems for suppliers. But the supply chain's rudimental relationship with the technology is beginning to shift.

"Three years ago I devoted most of my time, 80 per cent, looking at how to disrupt the business," says Bradshaw. "I want to recreate Matrix for the 21st Century – so now I spend 95 per cent figuring out what the business will look like in five or ten years, and how we are going to disrupt the market ourselves."

One way Matrix is hoping to achieve this disruption is by introducing AI into its business analytics. "We used to have a standard CRM System – now it tells us what to do," says Bradshaw. "We are deploying AI that is having a very positive effect. We challenge it sometimes because it doesn't always get it right.

"What we're doing now, five years ago only a multi-billion pound company could do."

Bradshaw says he'd rather be at the front than a sheep at the back – but he anticipates that what he is doing now will hit the entire market in future. "It will have such a profound impact that how we know procurement and supply chain will cease to exist," he says.

Evidence of the level of intelligence that these systems have, or could have, can often be vague – so how clever are they really?

"Algorithms have become proficient in recognising re-occuring structures and patterns," says Uwe Henning, CEO of Detego. "Applications range from smart systems in logistics that can learn certain process characteristics to optimise picking speeds; to more autonomous and accurate allocation and planning systems that direct goods to stores based on the

highest probability of selling; or self-learning assistants that provide guidance on operational processes."

Henning says that AI-based systems are excellent at recognising certain patterns and structures in nearly arbitrary amounts of data to find similarities and correlations.

"Pattern recognition in different forms - from voice over images, to identifying trends in more structured data - is the main application for AI at the moment," he says. "However, AI and machine-learning techniques still have considerable room for improvement – especially for things that involve totally unfamiliar situations or data-structures, which is where humans significantly outperform machines.

"The key is therefore to apply the available techniques to tasks that involve repetitive, high frequency, high volume scenarios and the triggering of actions based on certain patterns."

But the argument that algorithms aren't able to match human intelligence is starting to fade. AI systems are beginning to tiptoe into industries and creative roles that we only ever thought humans could do.

Detego has been developing self-learning systems and predictive analysis tools that are able to help businesses and brands better understand individual behaviour. It's all part of the wider retail picture; creating personalised supply chains. "Retailers can therefore make sure they offer the right products and services at the right moment in time through the most appropriate channel," says Henning. Instead of relying on gut feeling and intuition, Detego has established a bridge between consumers and retail brands.

"Right now, everyone who sells a product needs to design it, and that process is really inefficient," says Matrix's Charlie Bradshaw. "If Primark, for example, wants a new range of perfumes, it will take four to six months to complete that process.

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>
> **Dhananjay Nagalkar**

"The product development process is far too inefficient – AI will be able to do that for us, and reach out to all the different references." Matrix is already working on a project that will reduce product development from three months to three weeks.

As well as predicting or analysing trends in fashion, AI could decide which products are to hit the market next. For example, by identifying average temperatures in a particular city, country, or region, algorithms can match fashion retail stock to seasons. This would mean that a retailer might stock a

The Cloud

"People can't throw away their old systems but they want to understand how to take advantage of, whether its artificial intelligence, augmented reality, or Industry 4.0, without having to do a whole scale replacement of what they've got," says Dominic Regan, senior director of Oracle's value chain executive solutions, Western Europe, EMEA. "You have annual releases of a product, and then customers might take a couple of years to upgrade, and so by the time they've actually got the latest version of software that can take advantage of new capabilities, you're probably two or three years down the line."

Oracle has invested in artificial intelligence via the cloud to avoid this kind of scenario.

"With cloud all of the infrastructure, all of the upgrade side is somebody else's problem," says Regan. "Actually you can just focus on those areas of functionality that are really going to give some value – that's probably the key driver."

He says that businesses now know they can't afford to ignore AI, so they want to adapt it into their operations. For him, the introduction of cloud technology has been the biggest change he's seen in logistics for 15 years.

Many businesses are already dipping their toes in the water – using the cloud for one part of an operation to test it out for example.

"The difference in perception of cloud, delivering a solution that I can try out without that big up-front investment, that's been a real tipping point," says Regan. "They're still hesitant – people do have objections to it, and they do have it in a number of areas. There is probably some data that you don't want to put in the cloud, because people have concerns about security, rightly or wrongly they have those concerns.

"The chances are most of the data centres out there are probably more secure than their own internal IT departments. There's this fear, and partly justified, because you read all about the hacking and everything.

"People think, well actually, if I put my data out there. Who's going to get site of it?"

different range of jumpers in Athens, to that of London, creating a far more personalised experience and product range.

"AI will have so much access to data, and these algorithms can see, read, listen, they're extraordinarily powerful," says Bradshaw. "They are going to change the way we design."

The capabilities of AI are far reaching within the logistics space.

"Quite simply, it's the future of planning and controlling transport," says Steve Twydell, CEO of transport management software business 3T Logistics. "The algorithms of our systems are based on AI or AI interfaces and have taken over seven years to develop."

The algorithms are so complex that a significant part of their development process involved working with the computer science department at the University of Nottingham as well as PhD Students, all working together on how AI and algorithms can improve transport planning.

Twydell says that, in theory, artificial intelligence has been around since the eighties. Despite this, in transport, these systems have been used strategically rather than on day-to-day planning. He identifies the ability for the software to learn patterns and remember what can and cannot be done as the turning point for the transport management industry. "Applied to a set of ever-changing information and transport variables, these systems can continually reassess how products are moved or put together on vehicles to ensure a supply of instant information offering the optimal scenario," says Twydell.

"People can't throw away their old systems... they want to understand how to take advantage of...AI.

Dominic Regan

3T has developed smartphone applications which are able to process huge amounts of data quickly and instantly – and they make decisions that humans used to or currently make, but with stronger information. These systems are able to track loads, and have access to consignment information including: loading times, inventory number, estimated time of arrival and proof of delivery.

"However, this capability does pose a problem for companies who have relatively recently invested in expensive systems that are now almost obsolete," says Twydell. "Do they stick with what they have to get ROI – or cut their losses and invest in the new generation of AI systems?"

Once upon a time the great range and variations involved in transporting goods meant that even computers struggled to keep up with humans. But, says Twydell, with today's new algorithms and faster computers that are able to actually learn, software like 3T's can not only plan and produce better vehicle optimisation, it can do it much faster than any human being.

"We're one of the pioneers of rule based AI, we did that a few years back, we pushed for our own algorithms," says Dhananjay Nagalkar, vice president of technology at GEP Worldwide, a company that develops software for procurement and the supply chain. The business now has software application Smart for GEP, powered by AI, which provides close to 100 per cent accuracy for spend.

Nagalkar says that technology like Alexa, the intelligent personal assistant developed by Amazon, is going to be key in the future. GEP is in the process of using those tools and modifying them to work with procurement; adapting the technology so it is able to recognise any accent.

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Uwe Henning

"The AI that we are leveraging uses both operational data as well as analytics data," says Nagalkar. "We are asking about: categories, spend, next activities, and it will be a device like Alexa that is specific to procurement."

This is a device that can be directly spoken to and is able to quickly deliver information about CPUs and categories, as well as enabling the user to dictate rather than type. "We are piloting this with key customers this year – next year and the year beyond," says Nagalkar. He believes there will be early adopters of this technology by next year.

Artificial intelligence might seem intimidating or puzzling, but it is a concept that appears to be inevitable for the world's future.

"You only have to look at the example set by companies like Amazon, eBay and PayPal who have a good understanding of how to use technology to see how it can transform operations," says Twydell. "The logistics industry must keep pace."

Steve Twydell

AI in procurement

GEP has developed procurement software application 'Smart by GEP' which is designed for cloud, touch and mobile technology.

The software collects vast quantities of spend data from a number of sources and a wide-ranging level of completeness.

The data is then transformed into a single coherent piece of information. This is all done via the company's artificial intelligence engine, which is able to learn and retrain to find data and points that don't fit.

The AI is able use clues in raw data to inspect every invoice and currency, and subsequently identify a certain classification for that spend. According to GEP, if the classification isn't obvious enough, the software searches for matches and other hints from the data to find other sources to classify the data.

At the end of last year clothing retailer Brooks Brothers chose the software, and many other brands and industries have also deployed the application. These include a medical technology company, a mining business, and a leading hospitality group

"It's single code line which covers all of the processes from spend analysis, contract management, sourcing, information sharing etc. in a single code line," says Paul Blake, GEP. "We can provide a natural flow of the tasks from one step to next, without our customers having to use different tools in different places.

"There is a hard disconnect between what procurement does and what the company actually purchases. The larger the company the worse. Smart by GEP makes it possible for the value in procurement to actually be utilised."