Retail reimagined

The technologies that will drive global disruption over the next 10 years

RETAIL WEEK
FOREWORD

NICOLA HARRISON
HEAD OF CREATIVE INSIGHTS, RETAIL WEEK

Does your business have a chief intelligence officer, an AI resources officer or a head of storytelling? According to the experts we spoke to for this report, these are the types of roles retailers need to create in the near future if they are going to stand a chance of competing for consumers' hard-won spend and attention.

In the past 10 years, technology has reinvented the way customers shop and how retailers run their businesses around the world.

Whether it is the rise of automated warehouses or the ubiquity of contactless payment, the retail sector has advanced dramatically in the past decade as the pace of technological change accelerates.

It stands to reason then that the next 10 years will bring even greater change.

This report looks at how advancements in retail technology will impact people over the next decade, specifically by looking first at the effect of technological change on customers, then on the workforce and, finally, on those working across the retail supply chain.

Is your business grasping the potential of the cloud or blockchain? Is it set up to integrate AI and robotics into the organisation? How will these technologies impact the shopper journey of the future and also your workforce?

There are countless technologies that will turbo-charge the pace of change across the sector. And, as Ocado's chief technology officer Paul Clarke argues, it's hard to talk about them in isolation: "The exciting things happen where they collide."

This report seeks to paint a picture of how the industry will look in 10 years, giving retail leaders a glimpse of how technology will further disrupt the status quo and, importantly, how they can plan for it.

> **How will these technologies impact the shopper journey of the future and also your workforce?**

RETAIL WEEK CONNECT: RETAIL REIMAGINED

PARTNER
VIEWPOINT

GIANGI OLIVI
GLOBAL CO-CHAIR, RETAIL SECTOR, DLA PIPER

Worker robots, driverless transport and flying cars, all in the realms of science fiction and yet here we are. Legislation may be lagging behind the implications, but the best law firms will have technology and communications firmly embedded in their global offering to retailers and are prepared for any technology-driven, what-if scenario: drone hijack, driverless car hack, 'smart' wardrobe malfunction or whatever's around the virtual corner.

Fundamental design flaws and product safety issues can arise in the cut-throat race to market. All scenarios should be considered from the safety, regulatory and reputational aspect, and not just the incentive of avoiding costly lawsuits further down the line.

Similarly, your show-stopping, highly original and creative use of consumer data might easily become a costly breach of data privacy, despite the stated intent of GDPR to support economic development. Invest in the best legal advice before and after any product launch, as your creativity and your consumers' appetite for personalised experiences develops.

Winning over smartphone-carrying consumers will be achieved through a variety of measures and even retailers at the value end will know it's not the lowest price at any cost. Supply chain transparency, achieved using blockchain as described in this report, could reveal more than some might like: treatment of low-wage staff, food miles, waste or plastic packaging, any of which can be brought into the spotlight by social-media-savvy campaigners with the technological ability to put heavy dents in a company's reputation and market value overnight.

It will become more important than ever to tighten up on commercial contracts at every stage of the supply chain and be very clear about consistency in areas such as environment, ethics and employment.

Ecommerce is still ultimately driven by people working together and successful collaborations. Partnering and licensing agreements need well-thought-out, legally binding commercial contracts with built-in regard for future developments, keeping everybody on board.

With so many technological advances in the pipeline, it is time to align your best people, future-proof your strategy and embrace the changes ahead.

> **Supply chain transparency, achieved using blockchain, could reveal more than some might like**

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CHAPTER ONE
PERSONALISATION AND THE CUSTOMER JOURNEY

- ■ The internet of things and artificial intelligence will have the most transformative effect on retail by 2020
- ■ Smartphones will remain central and customer experience will be at the heart of technological advances
- ■ Physical stores of tomorrow will personalise journeys with magic mirrors, smart carts and facial recognition

THE STORE OF 2025: THE CUSTOMER JOURNEY OF THE FUTURE

ENTRANCE

Online **CHATBOTS** predicting behaviour

Internet of **THINGS**

FACIAL RECOGNITION

SMART SHOPPING CARTS

SMARTPHONES are central

HUMAN INTERACTION is still necessary

HEY!

MOOD-BASED MESSAGE SCREENS

MAGIC MIRRORS

WAY OUT

HAIR COLOR SIMULATION

Future-gazing film *Minority Report*, set in 2054, features several nods to what retail might end up looking like from a customer perspective. The movie, which came out in 2002, is effectively an advert for predictive analytics, the internet of things (IoT) and artificial intelligence (AI), focusing on how an understanding of human behaviour can intercept would-be crimes before they take place. And, in terms of retail, it brings to light some interesting potential technology-driven scenarios.

One scene shows a Gap store in which customers are recognised by a scan of their iris as they enter the premises, which automatically triggers a hologram to ask about a previous purchase from the brand. Another depicts a shopping mall where a host of personalised marketing messages on digital signage screens are directed at the protagonist, based on his mood.

These scenes from the film have been referenced on countless occasions at retail events around the globe. Be it facial-recognition systems, virtual reality or voice-enabled platforms, the tech in *Minority Report* exists today, with the potential to change the customer journey radically.

Some retailers are already deploying elements of it, but from the plethora of technologies touted as 'the next big thing', it remains to be seen what will establish itself as a firm part of the retail landscape in the 2020s and beyond.

Visions of the future

Research firm Forrester predicts that, between now and 2020, IoT will be the most transformative technology to businesses.

It believes software robots will replace routine tasks that humans do poorly, and a growing number of these will engage in work that drives customer outcomes by 2020. They will reshape customer experience by predicting needs, offering different forms of assistance and facilitating self-service.

And, by 2020, Forrester says businesses will start to shift rapid-cycle AI innovation to the cloud, fuelling innovation across sectors and impacting customer experience.

Advancements in AI, increased connectivity due to the IoT and robotics are the frontrunners for having the biggest impact, according to Paul Clarke, chief technology officer at online grocer Ocado.

"We think about the intersection of five key disruptive technologies that power our business: IoT, big data, cloud, robotics and AI," he says. "It's hard to talk about those in isolation because the exciting things happen where they collide.

> **We think about the intersection of five key disruptive technologies that power our business: IoT, big data, cloud, robotics and AI**
> **Paul Clarke, Ocado**

Of those, robotics and AI are going to be – and they already are for us – the most important in retail."

AI for the wider retail industry promises better stock management and forecasting processes. It facilitates the use of more chatbots for customer service and it can help retailers to predict consumer behaviour or make shopping suggestions based on accurate historical data.

Clarke notes: "We often refer to AI in the Tolkien sense as 'the one to rule them all'. It lets you do exciting things and is in a disruptive league of its own, online and offline."

God in our pockets

As retailers clamour to meet consumers' ever demanding expectations, there will be a range of new technologies in store, online and within the fulfilment and delivery process. But the smartphone is expected to be central to it all, according to analysts.

Retail futurist and former Fitch design guru Howard Saunders says the combination of AI development, greater use of mobile technology and a growing reliance on phones will have a dramatic impact on the consumer shopping journey.

"The condensed form of human evolution for me reads: fire, wheel, smartphone. I really believe that," he says.

"You slide your thumb and you have access to the sum of all human knowledge – 'the great overlord of data' as I call it, or god. We have god in our pockets.

BY 2020
businesses will start to shift rapid-cycle AI innovation to the cloud

Forrester

"There's nothing we can't access or find out by using that slab of glass."

As companies better use technology to get to grips with the customer data they have collected, the phone will effectively know everything a person does and likes, Saunders suggests.

"It'll result in businesses negotiating with each other to give you the best deal. It'll be offered up to you while you are asleep, so your phone – like the stock exchange – will be firing algorithms back and forward from retailers and brands, who don't know they are doing it, and you'll wake up to see the best offer based on your needs."

Alongside this technological movement, Saunders says, there is another trend painting a slightly different picture. As technology gets ever more sophisticated, he argues, there is a converse rise in the need for human interaction.

He argues that the advent of the digital world has forced people to think about what they actually want from "the real world" – and the answer is more community, interaction with people and club-like spaces. Similarly, he says, the rise of robotics and the promise of mechanical beings serving consumers in shops and facilitating retail will create a further desire for the human touch.

"AI is dumb in comparison [to humans]," says Saunders. "Humans can take slices of information and know just what sort of person someone is. There will be a huge

Interactive digital signage can recognise and target consumers directly

> ## "AI will enable retailers to really use big data, so we can walk into store and they'll know who we are
>
> **Will Higham, Next Big Thing**

rise in places that greet us and make us feel special. If that is augmented by technology, fine, but ultimately it's going to be about human connection."

The store of the future will evolve in line with these trends, and pureplays are starting to cotton on to the opportunities bricks and mortar provide.

Online going offline

Missguided, Chinese marketplace JD.com and catalogue retailer Boden are opening shops from a different perspective, which could influence the future look and function of physical retail.

Online giant JD launched quality fresh food grocery store 7Fresh in January, powered by cutting-edge technology.

For example, it has magic mirrors that sense when customers pick up an item of produce and then automatically provide information about its provenance on a screen. There are also plans for its stores to feature smart shopping carts that follow customers through the aisles. And goods can be paid for via mobile, including a facial-recognition system to trigger payment.

JD.com's plans are an indication of the potential direction of travel over the next 10 years as other digital natives try their hand at traditional shop-based retail.

BY 2020 software robots will replace routine tasks that humans do poorly
Forrester

"JD is uniquely positioned to bring this premium-quality offline shopping experience to Chinese consumers because of our supply-chain technology and scale as the country's largest retailer," explains Xiaosong Wang, chief executive of 7Fresh.

"With the highest efficiency and greatest knowledge of consumer preferences, as well as access to the highest-quality products, we can invest in a premium experience far beyond anything Chinese consumers have experienced before."

Experience is everything

In that one short quote, Wang uses the word "experience" three times – and it is a pivotal word in many new retail philosophies. The technologies that gain traction in the future will be the ones that clearly improve shopping experiences.

The technologies in films like *Minority Report* that will become part of everyday retail life will also be those that facilitate humanity in shopping, according to Saunders and other futurists.

Will Higham, behavioural futurist, founder of consultancy Next Big Thing and author of the book by the same name, says:

"The thing that stood out for me from *Minority Report* was when Tom Cruise's character is recognised in store via an iris scan – that for me was the most important thing from a retailer point of view.

"That's one of the ironies of all this new technology. Lots of it is trying to return us to an early 20th-century version of shopping. Today's technology will return retailers to delivering a much more one-to-one, local-style experience.

"Recognition and learning technology, enabling retailers to understand what people want, will be increasingly important," he adds. "AI will enable retailers to really use the big data they have gathered, so we can walk into store and they'll know who we are."
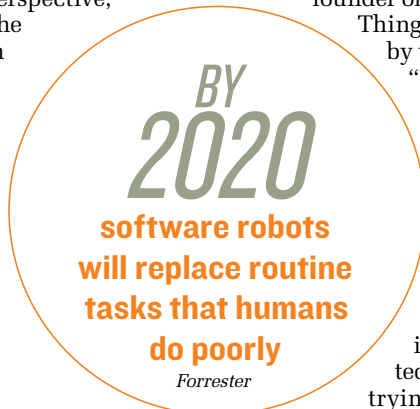
DLA PIPER ACTION POINT

Consumers will create and control their own shopping experiences with high expectations for personalisation. Retailers will need to:
• Adopt a nuanced approach to brand management, which acknowledges the growing collaborative relationship between consumers, brand owners and retailers.

• Navigate regulatory issues unique to technologies that facilitate 'hyper-personalisation', including the use of consumer meta-data, automation and technologies such as augmented reality.
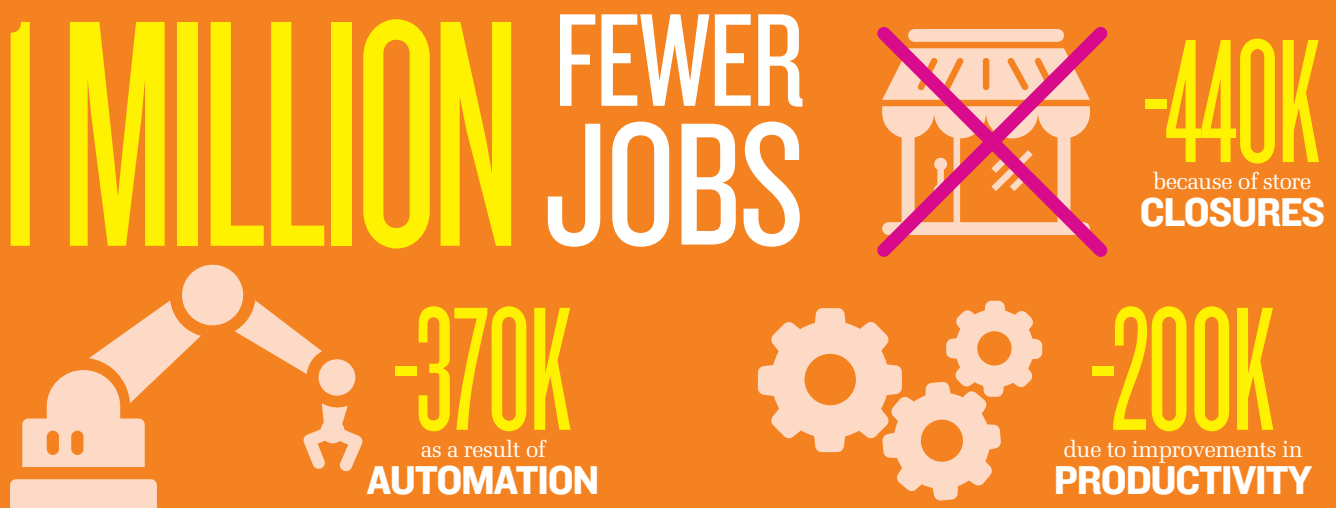• Protect content that is created or commissioned for novel interactive platforms.

• Employ targeted use of technology for customer engagement that differentiates between low-value and one-off high-value consumption decisions.
● *Melinda Upton, IP & technology partner, Australia*

CHAPTER TWO
TECHNOLOGY AND THE WORKFORCE

- Technological change and cost pressures have put the retail industry on a journey towards "fewer but better jobs"
- Many businesses now see themselves as technology companies rather than retailers, reflecting a shift in focus
- New jobs will emerge in technical and creative fields, such as CIO, CX design director and AI resources director

JOBS UPHEAVAL AND PRODUCTIVITY: LOOKING TO 2025

+100,000 ROLES CREATED

HIGHER QUALITY
HIGHER PRODUCTIVITY
HIGHER EARNING

Additional CREATIVE roles

More SERVICE jobs

Extra ANALYTICAL experts

1 MILLION FEWER JOBS

-440K because of store CLOSURES

-370K as a result of AUTOMATION

-200K due to improvements in PRODUCTIVITY

Source: *Retail 2020* report by the British Retail Consortium

It has been suggested there will never be more jobs in retail than there are today. But that doesn't mean we are seeing the disintegration of an industry – far from it.

The *Retail 2020* report by the British Retail Consortium (BRC), produced in 2016, spoke of the journey to "fewer but better jobs". It said the combined effect of ongoing structural change, an accelerated rate of store closures and productivity improvements means retail could have net 900,000 fewer jobs by 2025, compared with 2016.

These job losses are attributed to issues including the impact of technological change and cost pressures from Government initiatives such as the apprenticeship levy and national living wage.

The BRC suggests, however, that a level of efficiency will come from job substitution. As skill requirements of the industry change, there is expected to be a greater need for roles related to creativity, service and analytics.

The BRC is UK-centric, but patterns are similar around the world. Reflecting on AI's expected impact on retail jobs globally, Doug Stephens, author, futurist and founder of consultancy Retail Prophet, says: "It's safe to assume that jobs predominantly focused on gathering, interpreting or publishing data will be eliminated.

"Self-teaching AI and big-data technologies will accomplish in seconds what it may take a human weeks to undertake. We're already seeing this technology eliminate the need for jobs like loan officers.

"New jobs will emerge, largely in two distinct categories – technology and creative. On the technology side, individuals will be required to build and train robots and AI, just as humans are trained in the workforce today. These systems will essentially become a new kind of employee that requires set-up, orientation, training and development."

Meanwhile, on the creative side, Stephens predicts a need for "customer experience design professionals", tasked with creating compelling experiences across channels.

The post-retailer age?

The advent of ecommerce and new retail arrivals have already prompted a period of digital transformation, which is sure to accelerate, showing itself in different types of stores that focus on experience as opposed to row upon row of product lines.

Some organisations operating as retailers refer to themselves as technology companies instead – UK cases in point are Asos and Very.co.uk owner Shop Direct. This notion creates demand for different skillsets, with a raft of engineers, developers and security specialists set to shape and serve consumers in retail's new age.

Ocado views itself as part grocery retailer, part tech company and part platform provider for other companies. Ocado's Clarke says: "At the moment, roles like data science and AI are most sought after in many businesses, and we might see things that eclipse that in terms of quantum computing.

"From a retail point of view, I can see companies attempting to hire many more people with skills in data science and machine learning, and also robotics."

A change in philosophy is well under way, illustrated by a telling move by the US's largest retailer. In November 2017, Wal-Mart Stores Inc changed its trading name to Walmart Inc, acknowledging the new moniker as a better representation of its position as a non-channel specific business – retailing is not just about stores any more.

All of this underlines the evolution of the industry and points to changing roles for those working within it.

> ❝
> **Individuals will be required to build and train robots, just as humans are trained in the workforce today**
> **Doug Stephens, Retail Prophet**
> ❞

DLA PIPER ACTION POINT

Emerging technologies will present challenges and opportunities for retail brands over the next decade. Planning and executing the transition in the profile of their workforce will be key to success. HR directors and chief people officers need to grapple with integrating newly created roles (often performed by independent contractors working remotely), and remaining an employer of choice in a sector that will be constantly in a state of flux. Keeping diversity and inclusion at the heart of the people agenda will also be a challenge given that many of the roles that are likely to be impacted are those currently performed by under-represented groups in the labour market, often on flexible working patterns. Our current employment law protection regime will need to be reviewed (maybe overhauled) to ensure that it remains relevant.
● *Gurpreet Duhra, employment partner, UK*

RETAIL JOB ROLES OF THE FUTURE

HEAD OF CUSTOMER STORYTELLING

- Consumers want to buy products with compelling stories behind them

- This role adds colour to these tales, aiding both sales conversions and the shopper experience

If stores increasingly become places for customer consultancy or tech-fuelled brand experiences, as many predict, there is going to be a need for retailers to create the relevant roles to deliver such services.

Will Higham, behavioural futurist, founder of consultancy Next Big Thing and author, notes that AI has the potential to threaten the traditional make-up of multiple job sectors, including retail, but he says that paves the way for more customer relations roles.

He says: "Most of the jobs are going to have the word customer in front of them. The better the CX, the greater the loyalty."

And if, as retail futurist Howard Saunders suggests, consumers increasingly want to buy products with compelling stories behind them and artisan items that have interesting provenance and a clear back story, it opens up an opportunity for retail stores to employ people who can add colour to these tales, aiding both sales conversions and the shopper experience.

CHIEF INTELLIGENCE OFFICER

- There will still be someone who needs to own data gathering and related tasks

- This intelligence head frees up the chief technology officer or chief information officer to work with more customer-facing technology

Although much of the perceived benefit of automation, AI and machine learning is the simplification of data gathering and connecting tasks, there will still need to be someone who owns this area within a retail organisation.

Whereas before it might have fallen within the remit of the chief technology or information officer, there is now so much customer-facing technology for them to contend with that this has arguably become a standalone area of focus.

Add in the inevitable security issues and there is clearly a critical new senior role likely to materialise.

But Ocado's Clarke suggests it is not necessarily a simple case of creating job titles, but more about strengthening skills in new areas.

"In the area of AI, maybe we'll see companies have chief intelligence officers," he suggests. "That's not necessarily the most important thing – it's important to future-proof businesses in terms of the skillsets they have, from the bottom up."

CX DESIGN DIRECTOR

- Their remit will combine creative skills with newer tech, such as digital displays and related content

- This role provides consistency across channels, especially in terms of theatre and other compelling experiences

Arguably, this is a new type of visual merchandiser (VM), who will still require many of the creative skills of today's VMs, but will increasingly need to use technology, digital displays and content derived from other elements of their retailer's offering.

As retailers blend their online and offline properties to ensure brand consistency across trading channels, the theatre and overall look of the store may have to combine website and social-media features that create compelling, technology-augmented experiences.

Doug Stephens, founder of consultancy Retail Prophet, says: "On the creative side, customer experience design professionals will be key to a retailer's survival. Retail will start to look more like carefully produced theatre and will require creative individuals with a sense of stagecraft to create truly remarkable experiences."

RETAIL JOB ROLES OF THE FUTURE

AI RESOURCES OFFICER

- ■ **Human roles will still be needed to develop and manage the increasing use of AI**

- ■ **As robots effectively become part of the workforce, HR teams will need to have the capability to deal with them**

If the various analysts are correct and the use of AI assistants in retail accelerates considerably over the next decade, there will be human roles needed to develop and manage the production of this technology.

And if, as Stephens puts it, these robots effectively become part of the staff, there is an argument that retail HR teams will need to create departments to look after this burgeoning section of their workforce.

It remains unclear as yet whether that will be a head of robotics who leads the design and deployment of new systems, or individuals whose job it is to continually monitor man's relationship with machine within individual companies.

What is clear, however, is that there will be growing attention given to AI and that there will need to be people within retail organisations who take the responsibility for checking its efficiency and assessing its overall impact.

HOME DELIVERY PRODUCT CONSULTANT

- ■ **Just call them 'delivery person 2.0'**

- ■ **This person will arrive at the customer's home to help set up and explain a new product, rather than just dropping it off**

They may arrive by autonomous vehicle, but that will be the only thing robotic about this new retail role. It's a customer-facing job, but one that is conducted in a consumer's home and could be particularly useful in the technology, electricals and DIY sectors.

Call them 'delivery person 2.0' if you will, but the role will involve visiting a shopper's home with a pre-ordered product, spending significant time fitting the item if necessary, discussing its functionality and engaging more thoroughly with the customer.

This role is perhaps best embodied by Enjoy, described as "the world's first personal commerce platform". The US retailer sells consumer electronics online and employees hand-deliver products to a home, office or other destination of the customer's choice, before spending up to an hour teaching them how to use it.

It's perhaps no surprise that founder Ron Johnson was part of the team that encouraged Steve Jobs to create the Apple Store, known for its Genius Bar.

CHAPTER THREE
AN AUTONOMOUS SUPPLY CHAIN

- ■ **Jobs lost across the supply chain due to automation are set to be replaced by more customer-facing roles**

- ■ **The supply chain of tomorrow will incorporate drones, autonomous vehicles and increasingly robotic warehouses**

- ■ **Blockchain has significant potential for the supply chain, reducing costs and creating new job opportunities**

It is not just retailers that are reassessing their people and skills requirements in this age of technological advancement, but also their partners. And none more so, arguably, than those firms that operate across the retail supply chain.

As technology continues to grow in sophistication, automation becomes a reality in many areas of the supply chain. Analysis by professional services firm PwC suggests that up to 30% of UK jobs across all industries could potentially be at high risk of automation by the early 2030s.

According to the PwC research, the risks appear highest in sectors such as transportation and storage (56%), manufacturing (46%), and wholesale and retail (44%), highlighting the real potential for change within the retail supply chain – which all of these areas touch.

But, Rachael Stott, creative researcher at The Future Laboratory, argues that any reduction in distribution jobs will be accompanied by growth in employment at the customer-facing end.

Redefining roles

"Automation is more likely to change, rather than replace, the vast majority of roles in the retail sector, which will require businesses to significantly redefine many supply chain jobs," Stott explains.

"Through machine learning, these automated systems will inevitably evolve into more rounded personas that workers view as colleagues rather than tools, contributing to a more productive and efficient workforce.

"They will undertake repetitive and data-driven functions like replenishment and delivery, allowing retailers to utilise their staff in more human-centric roles that require problem-solving and empathetic customer service."

According to Retail Prophet's Stephens, the retail supply chain in 10 years' time will serve a very different industry to the one we see today. He estimates that 40% to 50% of items will be ordered online – and that will inevitably result in different types of job roles across the spectrum.
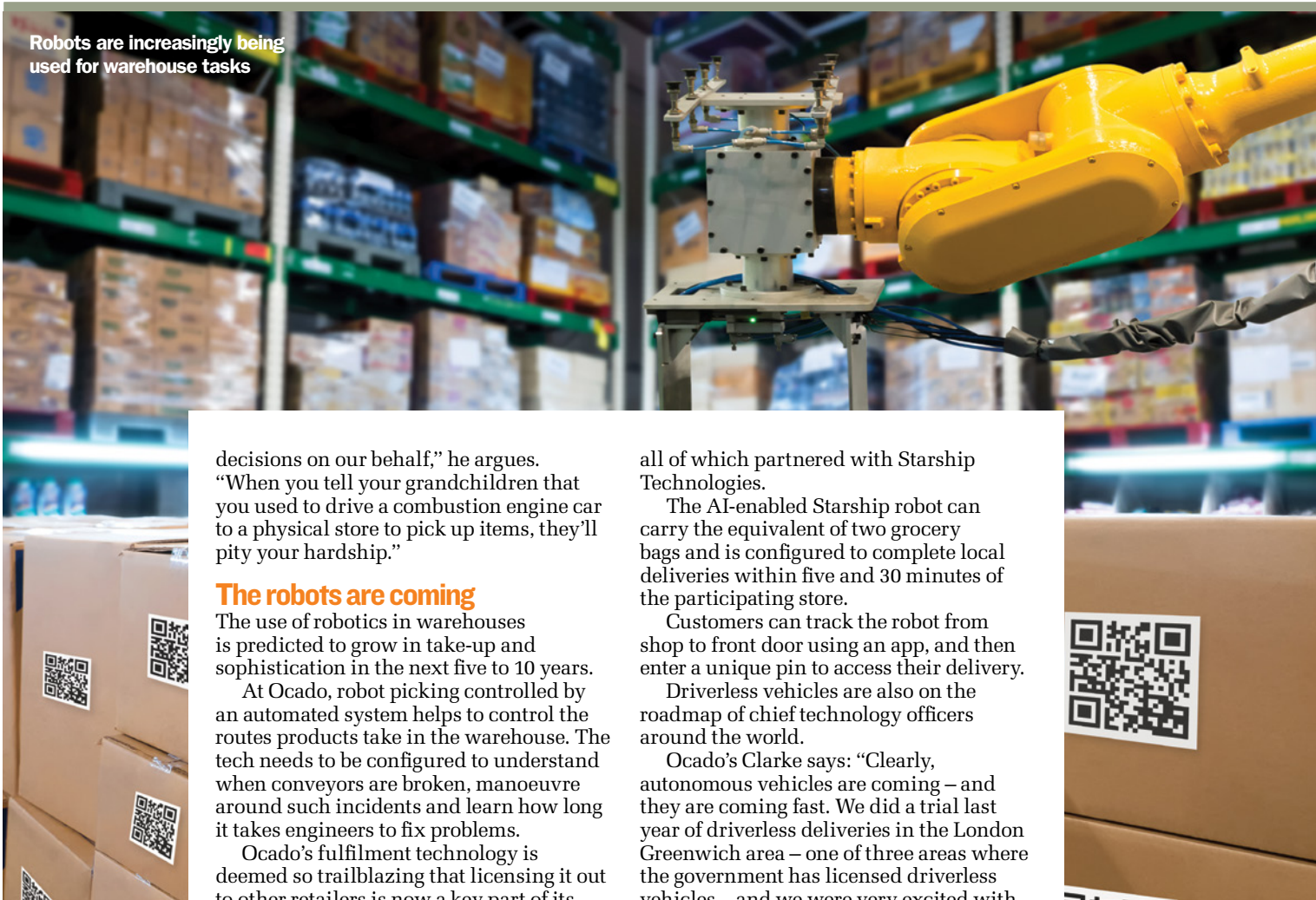
"Our homes, appliances, cars, product packaging and even our clothing will be connected, intelligent and capable of making purchase recommendations and

Starship Technologies has trialled robot deliveries for retailers and takeaway firms
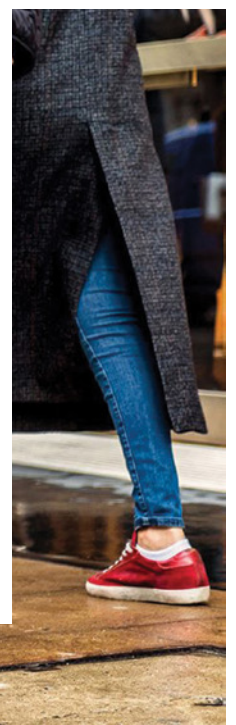
Robots are increasingly being used for warehouse tasks

decisions on our behalf," he argues. "When you tell your grandchildren that you used to drive a combustion engine car to a physical store to pick up items, they'll pity your hardship."

The robots are coming

The use of robotics in warehouses is predicted to grow in take-up and sophistication in the next five to 10 years.

At Ocado, robot picking controlled by an automated system helps to control the routes products take in the warehouse. The tech needs to be configured to understand when conveyors are broken, manoeuvre around such incidents and learn how long it takes engineers to fix problems.

Ocado's fulfilment technology is deemed so trailblazing that licensing it out to other retailers is now a key part of its growth strategy.

Ocado's Clarke says: "With the new robotic technologies we have put into our Andover fulfilment centre, it has leapfrogged what we already had. It's a constant process to leapfrog and disrupt ourselves."

This innovation in warehouse robotics will undoubtedly impact jobs. However, Hudson's Bay Company, which owns US department store Saks Fifth Avenue, rolled out new robotics-heavy warehouses in 2016/17 and promised the move would create new job opportunities.

Going the final mile

Drones and robots are also being tipped to transform the notoriously difficult final mile of the supply chain.

Notable experiments in this field come from Tesco, Domino's and Just Eat,

all of which partnered with Starship Technologies.

The AI-enabled Starship robot can carry the equivalent of two grocery bags and is configured to complete local deliveries within five and 30 minutes of the participating store.

Customers can track the robot from shop to front door using an app, and then enter a unique pin to access their delivery.

Driverless vehicles are also on the roadmap of chief technology officers around the world.

Ocado's Clarke says: "Clearly, autonomous vehicles are coming – and they are coming fast. We did a trial last year of driverless deliveries in the London Greenwich area – one of three areas where the government has licensed driverless vehicles – and we were very excited with the outcome. We're planning what we'll do next in that area."

Clarke also believes there will be a lot more Uber-style vehicles carrying both people and products in the future. Such a trend could accelerate as urban road networks get increasingly congested due to the rise of ecommerce.

What this means for jobs in the retail supply chain is unclear, but a report by professional services firm EY (entitled *What Will The Drivers Do When The Cars Are Driverless?*) suggests that when – not if – autonomous vehicles take over the driving, those previously behind the wheel will need to retool their skillset.

There are 3.5 million truckers operating in all industries in the US, many of whom are retail-focused, and there is expected disruption here. But perhaps there will be an opportunity to evolve into more

56%

of transport and storage jobs are at risk of automation by the 2030s

PwC
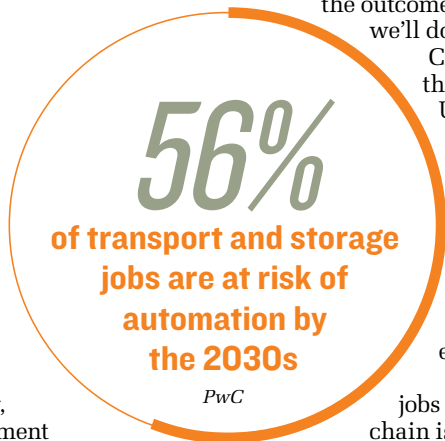
consumer-facing roles that function in combination with autonomous vehicles – like the home delivery product consultant, for example, referenced in chapter two.

Blockchain benefits

One potentially transformative technology that is on most chief technology officers' minds this year is blockchain.

"In the simplest sense, the promise of blockchain is to assure greater levels of accuracy through multiple points of data corroboration," explains Stephens.

"The payoff would be a massive potential reduction – and perhaps even elimination – of supply chain errors that cost corporations billions per year."

And the world's largest retailer, Walmart, hopes to do just that. It is working with IBM to address the problem of food contamination by giving greater supply chain transparency to growers, suppliers, processors, distributors, retailers, regulators and consumers.

Frank Yiannas, vice-president for food safety at Walmart, said at the time of launch last August: "Blockchain technology enables a new era of end-to-end transparency in the global food system – equivalent to shining a light on food ecosystem participants that will further promote responsible actions and behaviours."

In retail, it's not just Walmart. JD.com is also working with a growing number of partners to use blockchain technology to track each step of the supply chain, and has set up the Blockchain Food Safety Alliance alongside Walmart, IBM and Tsinghua University in China.

Jason Kelley, who leads IBM's Global Blockchain Services, says blockchain is creating a need for various jobs – and not just developers.

He recently blogged that companies working with blockchain are looking to hire business and technical consultants, software engineers, cyber security strategists, project managers, marketers and various other roles.

Very few retailers hold these roles in-house at present, but that might change in the future. If not, they will look to the tech companies that do have these skills.

Kelley noted that, as of October 2017, IBM had more than 400 blockchain projects in progress, employing more than 1,600 employees and with more than 150 job openings related to the technology.

Extrapolating from this example, the impact of blockchain could add up to a lot of potential job opportunities.

DLA PIPER ACTION POINT

Technology poses a conundrum for retail; the threat and challenge from the internet combined with product personalisation and a thirst for experience rather than mere products.

Investment in technology will be required either to develop online outlets to meet this demand or to accommodate the shortening of the supply chain to provide increased product personalisation. Technologies in terms of logistics, inventory and stock management continues to be important, so too is predicting customers' preferences. Data management and regulatory compliance will be key.

Investment in blockchain to assist in supply chain integrity could be deployed. Use of AI will assist this but requires investment and a reappraisal of the allocation of risk in the supply chain. There are certainly many considerations retailers will need to grapple with over the coming years.

● *Mark Dewar, IP and technology partner, UK*

CONCLUSION

Technology is already having a huge impact on people across retail, whether you're a customer, a retail employee or someone who works across the supply chain. That impact is only going to become greater over the next five to 10 years.

Technological advancements will more firmly place consumers in the driving seat, while rendering some jobs across retailers and their supply chain partners redundant.

But they will also provide retailers and their partners with greater impetus to restructure workforces to meet evolving customer needs, and provide new and exciting job opportunities for staff.

If it was difficult to keep up with the pace of technological change in the past 10 years, retailers must brace themselves for even greater disruption in the next decade, that is likely to make *Minority Report* look outdated.
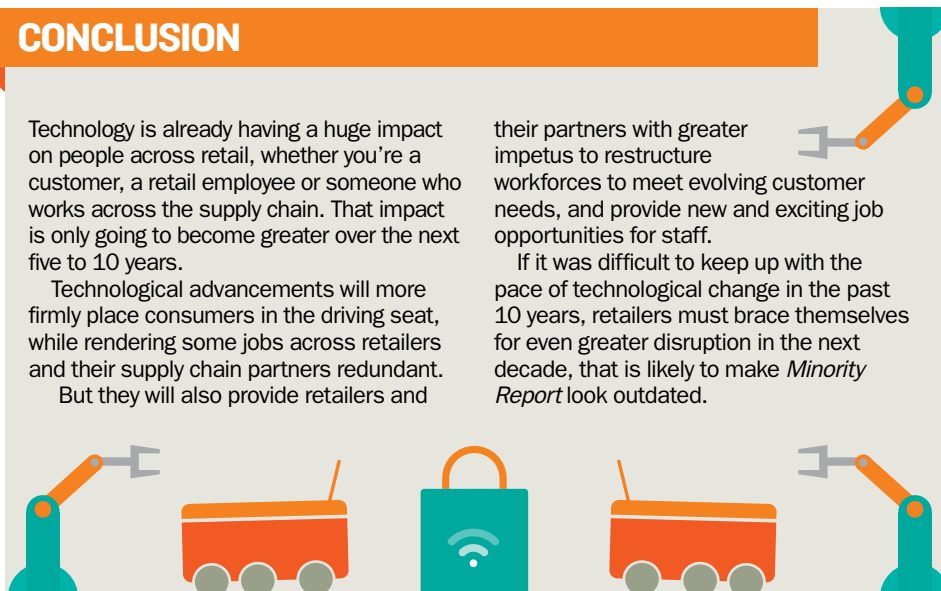
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