



Robocalypse: Now?

**What the 'Fourth industrial
revolution' means for retail**

KPMG International

kpmg.com/retail





Introduction

From robots in the aisle to customer service bots and simulation modeling across the supply chain, Robocalypse is coming.

With the likes of Professor Stephen Hawking, Bill Gates and Elon Musk talking about the potential of artificial intelligence to change the world for better or for worse, it's big news at the moment.

The fourth industrial revolution is coming and cognitive automation is its flag bearer. You may think that this is not relevant to retail or certainly not for the next 10 years. Well think again! Technologies that can think, learn and adapt will increasingly be part of our lives and sooner rather than later.

This is forecast to have a massive impact across a range of industries and retail is right up there. From robots in the aisle to customer service bots and simulation modeling across the supply chain, Robocalypse is coming.

So what does it all mean and what do we need to do about it? Well it's not an all or nothing game.

In this paper we provide a pragmatic view of who's doing what and how you can work out what will work best for your organization.

Picture the scene: armies of robots operating in industrial production lines, running day and night, performing the same repetitive tasks their programming dictates as their human masters look on. No, this isn't science fiction, but the reality of the modern production line, and a scene we're now very familiar with.

But things are changing. Rather than sticking to purely physical tasks, smart systems are now beginning to take on more of the cognitive load. This means that many jobs that have historically been safe from the threat of automation may no longer be so.

In fact, if the headlines are to be believed, hundreds of millions of jobs in the UK, the US and other major economies around the world are now at risk of automation by smart machines.

If you think that sounds a bit far-fetched then think again. 'Intelligent' technologies have been beating the humans at their own game for some time now. IBM's supercomputer, Deep Blue, took down world chess champion Garry Kasparov back in 1997. In 2011 IBM's robot super-brain, Watson, was able to defeat a 74-time winner of the US quiz show Jeopardy. And in 2016, Google's Deep Mind system beat the world's leading player of the Chinese board game 'Go' — a fiendishly complex game that has more positions than there are atoms in the universe!

As computers become increasingly able to take on non-routine tasks, an evolution of the workplace (and the world) is set to take place. The 'fourth industrial revolution' is upon us. Predictions of the scale of the impact on employment vary, but they all point to a shift of seismic proportions. Recent research by Citibank in partnership with the University of Oxford predicts an average of 57 percent of jobs in OECD countries are at risk of automation (47 percent in the US and 35 percent in the UK), while China faces much higher risk at 77 percent.¹

Others estimate that the overall impact across the economy could be higher, with the Chief Economist at the Bank of England, Andy Haldane, suggesting that 15 million jobs in the UK (around half of the workforce) could be at risk.²

As retail leaders we're accustomed to change. We deal with changing shopping habits, channel shifts, economic and political uncertainty and disruptive new competitors on a daily basis. But all this change is expensive, frankly unaffordable, unless a step change in productivity is achieved. For a business to survive and thrive in tomorrow's market, a new retail model, enabled by automation, is required. The future is coming fast and only the fit-for-purpose will survive.

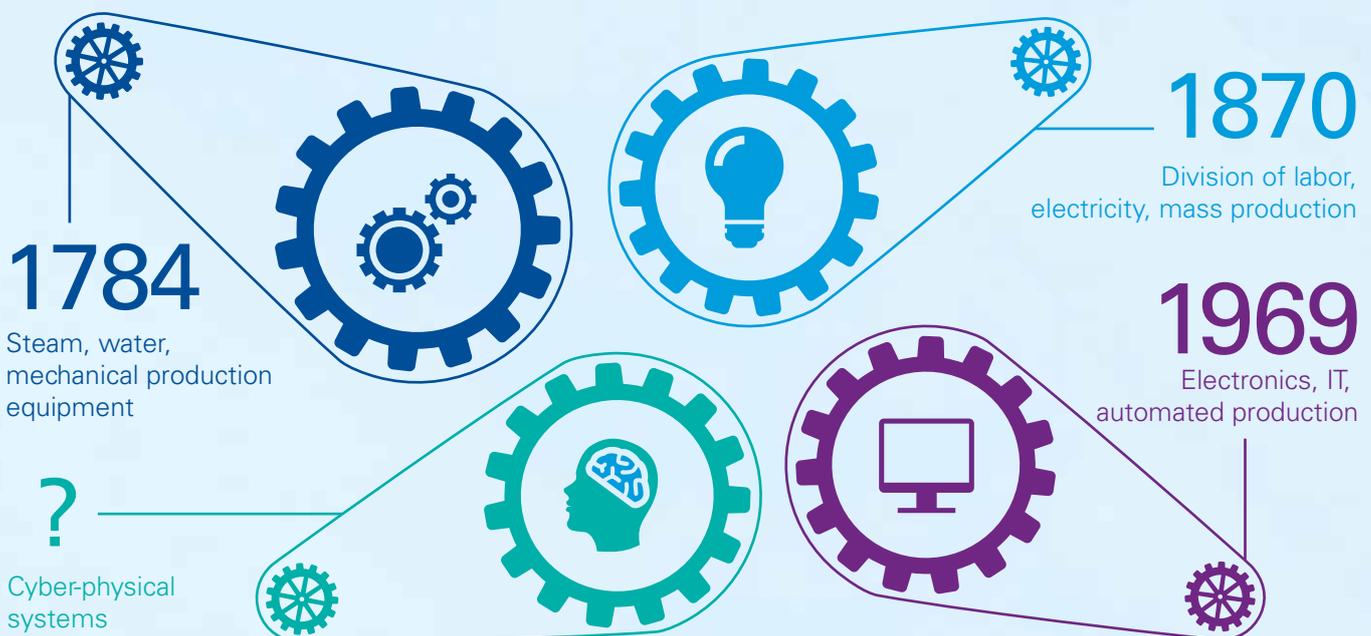
In this paper we aim to bring some clarity to the practical application of both physical and cognitive automation in the retail model. We look at the retail value chain in some detail and provide examples of where these new technologies can be deployed. We provide some context on what is happening in other industries, debunk some myths and draw conclusions about what the technology can and can't do. Our intent is to provide retail leaders with a grounded, practical perspective on the opportunity that the fourth industrial revolution presents, and the very real risks of ignoring it.



¹ <http://www.oxfordmartin.ox.ac.uk/downloads/academic/future-of-employment.pdf>

² <http://www.bankofengland.co.uk/publications/Pages/speeches/2015/864.aspx>

Navigating the next industrial revolution



Source: <https://www.weforum.org/agenda/2015/09/navigating-the-next-industrial-revolution2/>



Definitions

Whether it's the automation of basic office processes, robotically enhancing your means of production or venturing into the exciting world of analytics, AI (artificial intelligence) and augmented reality — every business will, at some stage, feel the impact of the technological revolution. The terms may sound complicated, but the process of integrating these new technologies into your business needn't be. The real challenge will be for executives to remain fully informed about where the advances in technology are heading and agreeing on how best they can be deployed to create commercial advantage in their own businesses.



On one end of the spectrum we have robotic process automation (RPA) — these are activities that are process-oriented and rules-based. On the other end of the spectrum are cognitive technologies where activities are characterized as judgment and skill oriented.

Class 1 Basic robotic process automation (RPA)	Class 2 Enhanced process automation	Class 3 Autonomic/cognitive automation
<p>This is the automation of the rudimentary 'swivel-chair' processes found in almost all organizations — processes that are repetitive in nature, involve multiple systems and follow explicit steps, such as cutting information from one system and pasting it into another. These tools often sit on the desktop and log on to systems as a human would. Generally they're thought of as quick-hit technologies that allow for a very piecemeal approach to automation.</p>	<p>This is the automation of processes not classified as rudimentary. Tools in this category have additional capabilities that allow them to solve problems and perform basic work activities (out-of-the-box knowledge). These additional capabilities include the ability to understand natural language (Natural Language Processing) and therefore interpret unstructured data such as emails and social media content, and/or the ability to learn new knowledge by either watching a human solve problems or by consuming additional data. Tools in this category can utilize years of experience gained across multiple organizations, and have the ability to completely transform back-office processes.</p>	<p>This is the category surrounded by the most hype. Cognitive automation refers to cognitive software that mimics human activity, such as perceiving, inferring, gathering evidence, hypothesising and reasoning. And just like humans, cognitive software solutions are taught rather than programmed. In other words, while we program explicit steps into a traditional computer to solve a problem, in a cognitive solution, we would teach it the area of interest (the domain). Once the base domain knowledge is established, the cognitive solution continues to learn and solve problems within that domain — usually all on its own.</p> <p>The real power of cognitive computing is the ability to ingest massive amounts of data that a human brain lacks the time or capacity to handle. When cognitive solutions are combined with advanced automation, then systems can be trained to exercise judgement when performing tasks.</p>

Robotic applications within the retail value chain

With data from the Office of National Statistics showing retail vacancies in the UK averaging an all-time high of 100,000 in the 12 months to October 2016, it's hardly surprising that automation is being hailed as a possible solution.¹

The scope of the revolution is massive, and businesses of the future will feel the impact at every level of the value chain and across the entire customer journey — from their basic strategy, right through to their delivery mechanics. Whether it's a faster, cheaper means of production that's closer to the consumer or an algorithm that facilitates the hiring of the best staff — the long robotic arm of technology can, and will, reach far and wide.

So where in the chain will we see the greatest value? Well that depends. After all, the automation of sales staff at a luxury goods retailer will have a very different impact on customers to the same process in a DIY store. Only by understanding what your future value proposition needs to be will you be able to determine how and why the new technologies can help.

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Technology appears to be resulting in faster, wider and deeper degrees of hollowing-out than in the past. Why? Because 20th-century machines have substituted not just for manual human tasks, but cognitive ones too. The set of human skills machines could reproduce, at lower cost, has both widened and deepened.

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— Andy Haldane,
Chief Economist at the Bank of England²

¹ <https://www.ons.gov.uk/employmentandlabourmarket/peoplenotinwork/unemployment/datasets/vacanciesbyindustryvac02>

² <http://www.bankofengland.co.uk/publications/Pages/speeches/2015/864.aspx>

Robotic applications

Fully automated

AI makes decisions for all tasks

Highly automated

AI makes decisions for routine tasks

Semi-automated

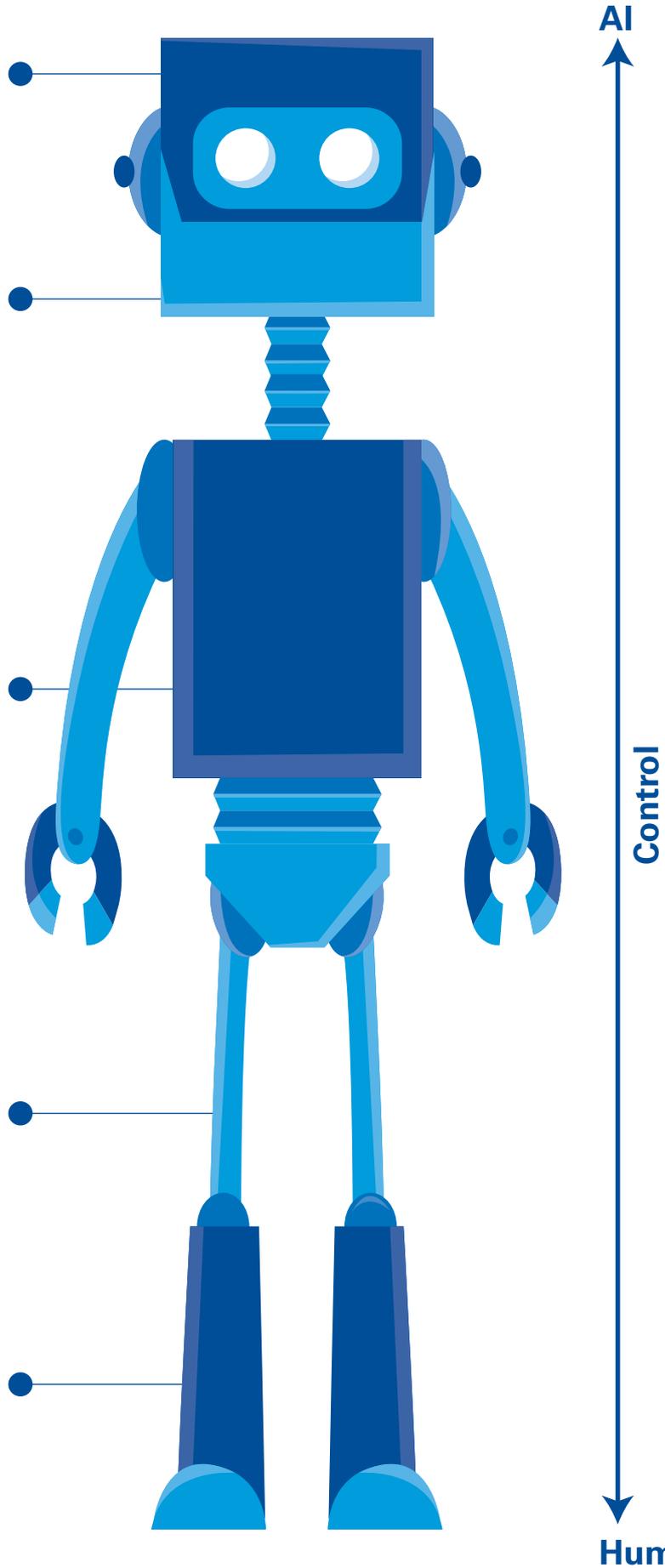
AI makes the decision, but humans confirm before action

Assisted

AI recommends, using algorithms, but humans make the decisions

Manual

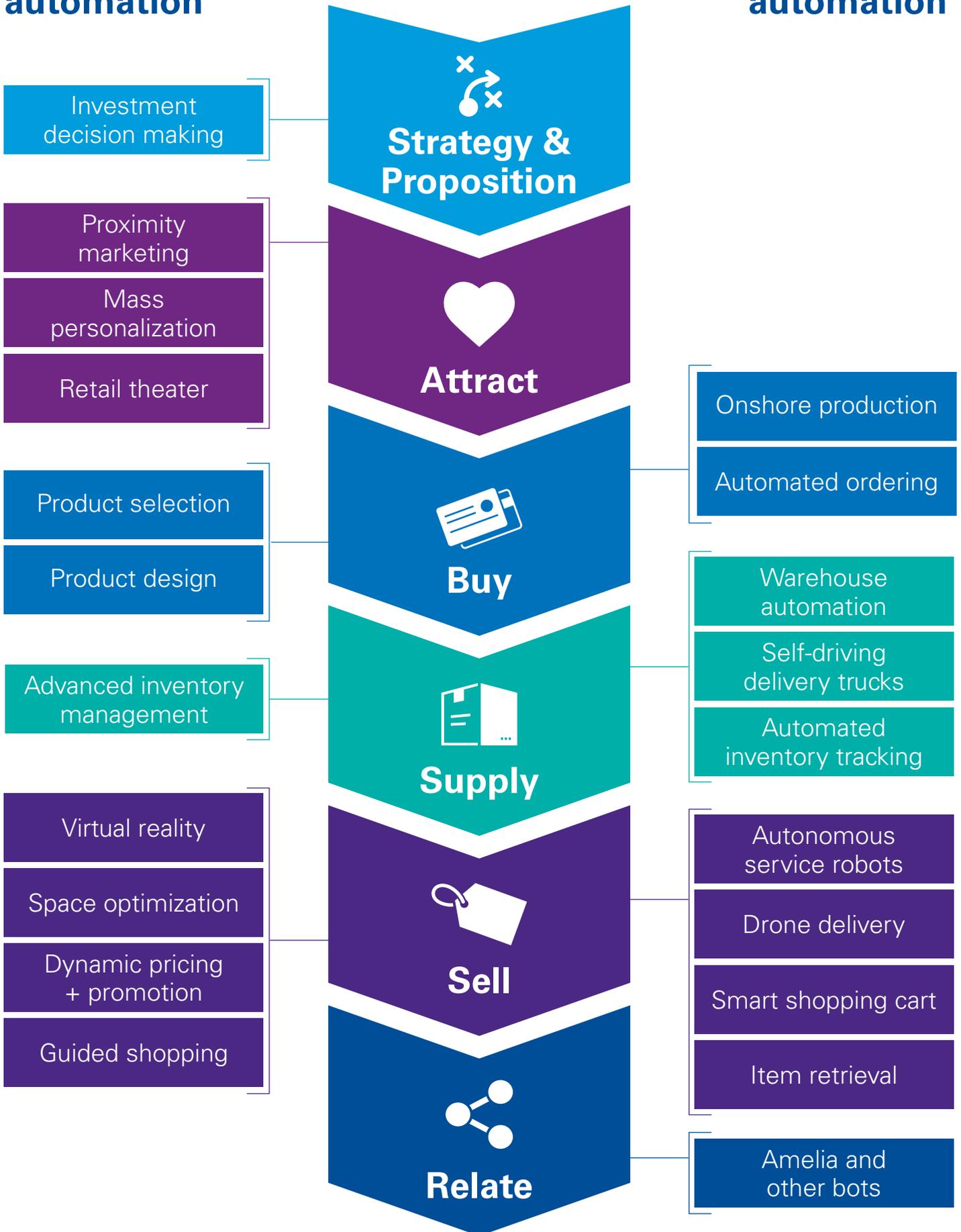
All decisions made by humans



Source: http://www.zdnet.com/article/future-enterprise-companies-will-be-ran-by-robots/?loc=newsletter_large_thumb_related&ftag=TRE17cfd61&bh_id=27269171161392473203821961153211

Cognitive automation

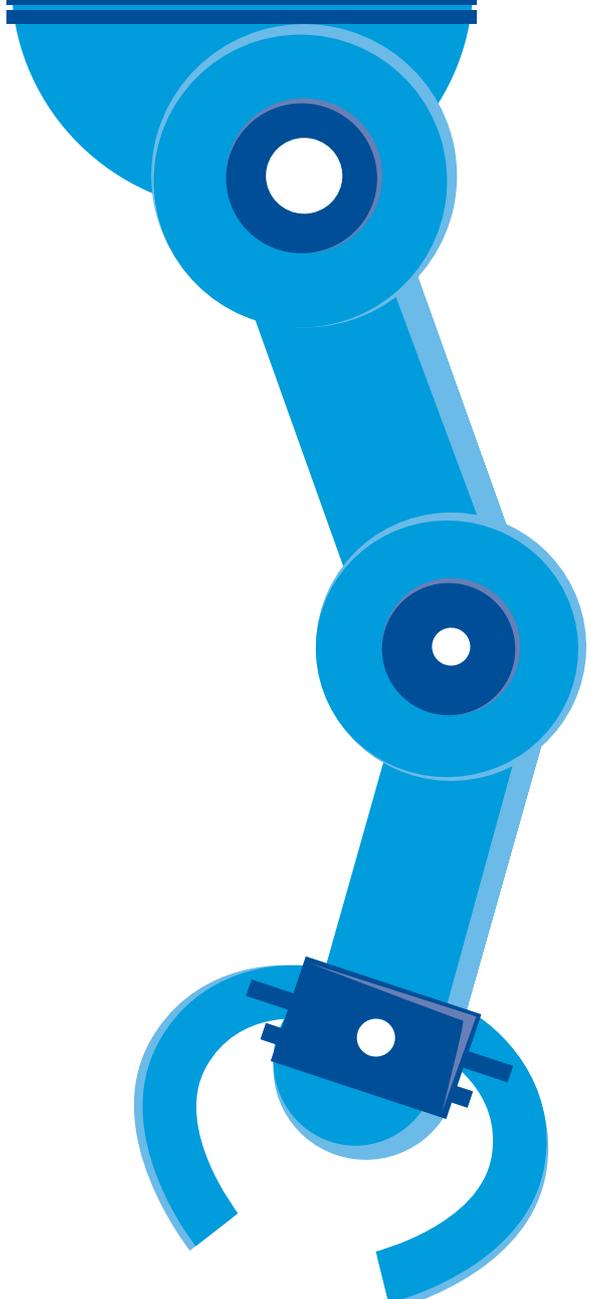
Physical automation





Strategy & proposition





The good news is, not all jobs have the same chance of being automated. According to research conducted by The University of Oxford, there's only a 1.5 percent chance of CEO roles being fully automated.¹ Coming up with instinctive or lateral solutions and the art of negotiation are still human territories it seems. But that's not to say that all CEO level roles are safe from the rise of the smart machines, as executives in Hong Kong are finding out.

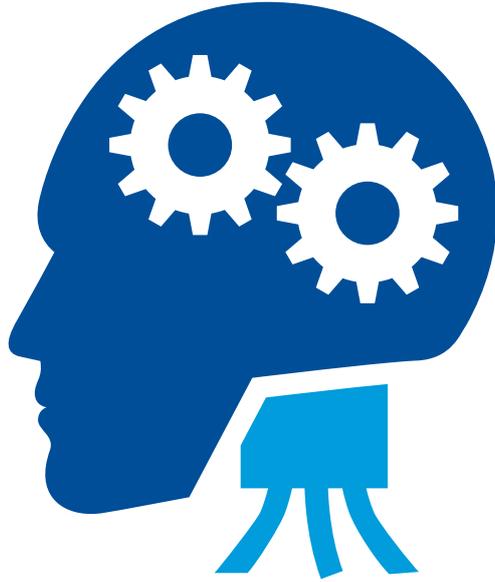
A robot on the board of directors? How investment decision making is changing.

It might sound like science fiction, but one Hong Kong Venture Capital firm, Deep Knowledge Ventures, has already hired an artificially intelligent algorithm to its board of directors. The 'Validating Investment Tool for Advancing Life Sciences' (Vital, to his friends) uses a complex algorithm to predict which companies will be a good investment. By mixing human intuition and expertise with a machine's logic, the company believes it can build the perfect collaborative team.²

The fact is, as AI matures we're entering an era where a significant proportion of work considered inherently 'human' can be automated. But incorporating these new technologies into your business requires a major transformation from top to bottom.

“
This is not a technology discussion. This is a business strategy discussion, it starts at the top with leadership and stakeholder management.”

— Vinodh Swaminathan,
Managing Director of
Innovation and Enterprise Solutions,
KPMG in the US



¹ <http://www.oxfordmartin.ox.ac.uk/download/s/academic/future-of-employment.pdf>
² <http://observer.com/2014/05/v-c-firm-names-robot-to-board-of-directors/>

Attract

More data. More insight. More success.

Companies now have more information at their fingertips than ever before. Automated data-gathering systems mean that businesses have instant access to a range of information on their customers, their competition and the various market trends. As more data allows greater customer segmentation, brands can talk directly to people with targeted messages that are engaging and relevant. The technology even allows companies to track the success of these messages and fine tune their approach if necessary. This more agile way of working can improve both the customer's experience and the marketing department's conversion rates. Big data is now big business. There are now countless examples of this kind of data gathering within the retail space.

Proximity — the fifth 'P' for a long list of prestigious retailers

Product. Price. Promotion. Placement. The renowned 4 Ps of Marketing — a concept created by E Jerome McCarthy in 1960. And now, arguably, we have a 5th 'P' — Proximity Marketing. Proximity Marketing uses cellular technology to send targeted marketing messages, via a Wi-Fi or Bluetooth signal, to mobile phones that are in close proximity to a business.¹

Whilst the audience is limited to those within close range of a store, the message is a fast, user-friendly way to reach the consumers most likely to buy.

World-famous brands such as Hamleys, Longchamp, and Hackett have all deployed beacons in their Regent Street stores with the aim of pushing exclusive and personalized marketing to customers via this type of iBeacon technology.²

As they pass by, shoppers receive alerts and tailored content about everything, from new in-store promotions to exclusive offers only available to visitors of that store. The app also allows shoppers to input their own preferences.³

Mass personalization — getting consumers to vote with their thumbs

The fact that AI can now take on the cognitive load required to formulate personalized offers and refine these based on actual customer response, means we're heading for a level of mass personalization hitherto unknown. Smart systems are now at the forefront of the race to grab consumer attention with most growth coming from mobile.

Shop Direct, which runs very.co.uk and Littlewoods, predicts that AI is now the key to the future of online retail.

¹ <https://www.forbes.com/sites/gregpetro/2014/10/08/how-proximity-marketing-is-driving-retail-sales/#e0f09563ed43>

² <https://www.marketingweek.com/2014/06/04/hamleys-armani-and-hackett-to-use-ibeacons-for-personalised-marketing/>

³ <http://www.ibeacon.com/londons-regent-street-adopts-ibeacon/>

Retail theatre goes to the next level

The growth of in-store analytics mean businesses can now utilize all sorts of different customer data and use it to improve footfall and customer service, utilize space more effectively and improve store layouts. This also means that customer 'theatre' has become an integral part of the shopping experience with many stores using interactive screens and booths to grab attention.



You have three seconds to seize the shopper's attention — it's called thumb stopping, the three-second audition. That's where personalization comes in.



— Alex Baldock,
Shop Direct's Chief Executive¹

Tommy Hilfiger

Tommy Hilfiger's new digital showroom in Amsterdam is an example of how technology is shaping the future of retail. Through an interactive touchscreen table customers are able to view every item in the Tommy Hilfiger collection, zooming in to view design details and textures and clicking on each item to reveal price, color options and sizes. They can even design their own custom orders by dragging and dropping items onto a blank background to create different looks. At the end of the process, customers are emailed with a PDF of their complete order.

Tommy Hilfiger expects that within two to three years all of its showrooms worldwide will be equipped with this technology.²



¹ <http://www.telegraph.co.uk/business/2016/11/08/artificial-intelligence-the-next-big-bet-for-online-retailers-sa/>

² <http://global.tommy.com/int/en/newsroom/archive/2015/tommy-hilfiger-transforms-sales-experience-with-launch-of-innovative-digital-showroom/c29731>

Buy

Automation is transforming products and the way we source them

The application of the algorithm is potentially endless. Design, pricing, space optimization, product selection — all these processes can be optimized by harnessing this type of technology. Even the process of buying stock can be automated using an algorithm. But does this mean we're losing the human touch? Well not necessarily. Most businesses would argue that technology such as computerized design tools can help us cut out some of the more tedious processes, but they can't replace human insight entirely. Where technology and human initiative work together however, the opportunities are limitless.

The trend for onshore production

Thanks to advances in the technology available, factory processes are becoming increasingly automated. Manufacturers that, in the past, moved their operations to China or India are returning to Europe as the processes of production become more efficient and cost effective. Automated production lines are revolutionizing the face of manufacturing and the race is on to see which companies can adapt the fastest.

Products thought up and designed by... robots?

Rather than using software to simply draw a designer's vision, new technology allows designers to use computer power to generate the idea itself. The traditional design process can be a laborious one, but now we have software that's capable

of sorting through all the design possibilities for a specific product with specific measurements, and selecting the best option. This means businesses can get their product to the market faster whilst reducing their costs.

adidas

adidas, for example, has announced it's to bring its shoe production back to Germany. It's new 'speed factory' has only 160 staff and is able to make a pair of trainers in just 5 hours, as opposed to several weeks.^{1,2}

By moving production to a single location, businesses can simplify very complex supply chains and drive efficiency. Plus, by moving the means of production closer to the final consumer, supply can be more closely matched to demand, particularly in FMCG and fast fashion.



¹ <http://www.adidas-group.com/en/media/news-archive/press-releases/2016/adidas-expands-production-capabilities-speedfactory-germany/>

² <https://www.theguardian.com/world/2016/may/25/adidas-to-sell-robot-made-shoes-from-2017>

Product selection tools that map market trends

Algorithms can also be useful when it comes to stock selection — keeping companies informed about market trends and helping them build their range of products accordingly. Many leading retailers now use assortment planning software to help them manage demand and meet the ‘anytime, anyplace, anywhere’ expectations of today’s ‘martini consumers’.

Two such retailers are beauty company Birchbox and one of Turkey’s leading online fashion brands Trendyol. By using data to determine in advance how a product might perform, both these companies have been able to successfully reduce or increase inventory in response.¹ So instead of buying now and hoping

for sales later, or resorting to discounts when stock doesn’t sell, retailers can take a more informed view on how much to invest.

Automated ordering systems that keep the shelves full

The concept of retailers, particularly supermarkets, using systems that combine inventory data, delivery lead-times and demand forecasts to determine when an order should be placed is not new.

What is new is the sophistication of the technology. The range and volume of data feeds that are used and the ability for the system to learn based on actual performance means that the need for human participation is rapidly diminishing.

Autodesk

Autodesk, a 3D design, engineering and entertainment software company, is testing software that can optimize the design of 3D printed physical objects with genetic algorithms. Once constraints and fundamental requirements are specified by the human designer, the AI designer starts whittling away at a solid mass that fits the constraints, learning as it goes until the optimized design for the object is reached.²

¹ <https://autodeskresearch.com/projects/dreamcatcher>

² <https://econsultancy.com/blog/68525-how-birchbox-and-trendyol-approach-data-and-personalisation/>

Supply

Robotics will fully replace manual labor. True or false?

If it's true, the rise of the machine means the decline of manual labor, but it also means companies can improve their supply chain and cut their costs, with employees freed up for higher value work consumers can receive a faster, more efficient service.

An ever-better customer experience is what today's consumers are striving for. And it's something that many companies are starting to provide, whether that's through better relationship-based marketing, more efficient delivery mechanisms or a technologically enhanced experience in store.

One for the road — driverless logistics now a reality

With driverless logistics now rapidly becoming a reality too, companies can also make a positive impact on the environment with cleaner, more efficient transport that can cut down on human error and improve traffic flow. 'Smart trucks' and 'truck platooning' is now predicted to become the future of road haulage with vehicles travelling in long convoys with one main truck connected wirelessly to the others.

Say hello to Tally — the Automated Inventory Tracking Robot

The weekly shop may never be the same again with the arrival of Tally — a new kind of retail worker who can tell immediately when a store shelf is running low on cornflakes or the tomato soup is in the wrong spot.

Tally is currently one of a number of robots being tested in a handful of Target stores in San Francisco.¹ He (or she) is the creation of Simbe Robotics, a small start-up making robots for

the retail industry. Its goal is to create robots that will tackle "dull, dirty, mundane tasks 10 times better than their human counterparts", according to CEO and co-founder Brad Bogolea.

Bogolea estimates that in an average store it takes an employee 20 to 30 hours a week to audit between 10,000 and 20,000 products. Tally, however, can scan 15,000 items in an hour.²

JD.com

JD.com is a great example of this kind of robotic efficiency at work in the supply chain. Producing everything from smartphones to diapers, their automated warehouse can process up to 20,000 packages in just one hour. Due to robotic unloading systems, barcode scanning, automated vans and even drone deliveries, the company now employs one person where it would have employed 500 and has drastically reduced the travel time associated with order fulfilment.^{3,4}

“For new technologies to be fully embraced they need to be implemented in the most useful ways possible.”

— James Bartram,
Planning Director, Field Day London⁵

¹ <http://fortune.com/2016/04/28/target-testing-robot-inventory-simbe/>

² <http://money.cnn.com/2015/11/10/technology/robot-tally-store/>

³ <http://ir.jd.com/phoenix.zhtml?c=253315&p=irol-newsArticle&ID=1979115>

⁴ <http://uk.reuters.com/article/uk-china-jd-com-idUKKCN0I903D20141020>

⁵ <https://www.theguardian.com/media-network/2016/mar/09/robots-future-retail-good-publicity-ai-drones>

Anheuser-Busch

Anheuser-Busch and logistics specialist Otto have already made the world's first commercial shipment by self-driving truck. Otto's autonomous truck transported a trailer of Anheuser-Busch's Budweiser beer 120 miles through the US state of Colorado, from Fort Collins to Colorado Springs. While a driver was present for the journey, they merely monitored things from the sleeper berth and did not intervene at any time.¹

This groundbreaking journey is an important milestone for the logistics industry.

Simulation to underpin advanced inventory management

Inventory management approaches have traditionally focused on marginal gains associated with maximizing product availability rather than achieving a more optimum balance of labor costs, inventory and availability.

High-street retailers need a fundamentally new approach that enables transformational improvements, helps to proactively manage changes to the customer proposition and answers the challenges raised by discounters and channel specialists.

KPMG is currently working with a major UK supermarket to apply simulation technologies and design a vision for a high-performance replenishment process, capable of balancing availability with a significant reduction in operational costs and inventory.

This kind of simulation allows experimentation within a safe, virtual environment and can provide feedback and results in days rather months. This allows companies to act with confidence when operating outside existing organizational models.



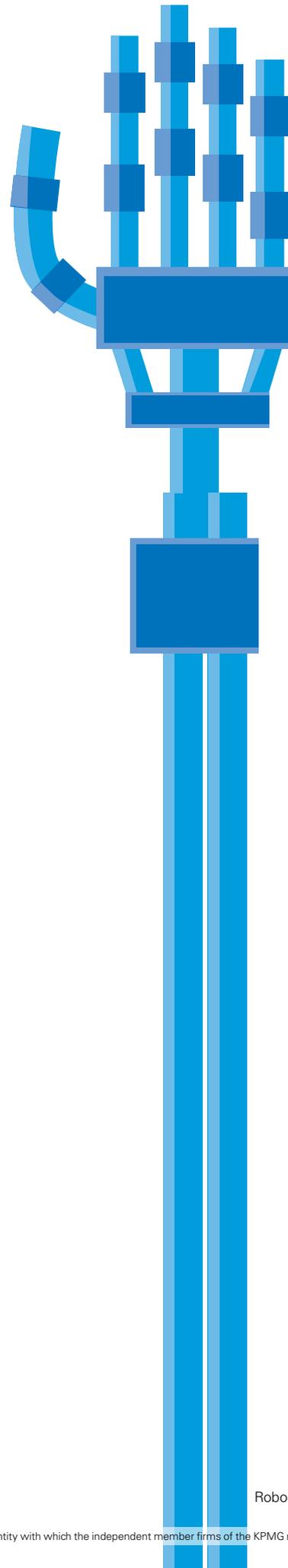
We hope to see this technology widely deployed across our highways to improve safety for all road users and work towards a low-emissions future.



— James Sembrot,
Sr. Director, Logistics Strategy at AB InBev²

¹ <https://blog.ot.to/proudly-brewed-self-driven-95268c520ba4#.t11s1ltI5>

² <http://www.anheuser-busch.com/newsroom/2016/10/otto.html>



Sell

Welcome to a new in-store experience

From physical robots that can show you where the toothpaste is, to algorithms that know what you want before you do, technology is now at the heart of the shopping experience, whether we like it or not.

Businesses can now have real-time knowledge of their customers both on and offline. And it's an all-channel approach that will ultimately win the day — a 360-degree experience that's seamless, so all the customer sees is the brand and how it makes them feel. With online and offline activities fully integrated, it's now possible to browse online, make an appointment in a digitally enabled store, then have the technology in that store highlight items for you, access their specific details, and even bring them to you. From intuitive mobile apps to drone deliveries, the opportunities across all sectors are mind-boggling.

The shopping cart that's happy to help

One way brick-and-mortar stores are looking to compete with the ultra-convenience offered by online retailers is by developing smart shopping carts. As well as saving customers from the physical effort of pushing a laden cart around, the technology also helps customers find items on their shopping list.



Creating an online shopping experience enhanced by technology such as augmented reality and virtual reality or 3D is becoming at least as important as providing convenient and personalized ordering, payment and delivery options.



— Willy Kruh,
Global Chair, Consumer & Retail, KPMG International

Optimizing space, pricing and promotions

Space is at a premium in today's retail environment and businesses need to utilize every inch to make their profit. Shelf space optimization is a fine art that can be optimized by an algorithm. For instance, stores can allocate space for

commodities in proportion to their sales figures or specify a more effective aesthetic layout, which can both increase sales and cut labor costs.

Businesses now also use algorithms to adapt their pricing structures to reflect a wide range of specific factors, such as desired profitability, stock levels, historical customer interest, seasonality, competitor prices and sellers' inventory levels.

Pricing analytics are key for any retail business looking to compete against online pure players. Retailers who don't develop such a capability are likely to become trapped in a cycle of discount and promotion.

Uber's pricing model is now a notorious example of algorithmic data in action. By setting their prices based on the laws of supply and demand, Uber has succeeded in dominating the market and effectively re-written the rules of pricing.

The North Face

The North Face customers can now find exactly what they want faster than ever with the launch of their new state-of-the-art mobile shopping app, Watson. It's the first mobile app experience to put Watson, the powerful artificial intelligence computer owned by IBM, to use in a retail environment. The app allows you to speak to it openly on the phone — where the Watson-powered shopping assistant will engage you in a question-and-answer conversation to help figure out exactly what you need.

Watson's artificial intelligence works by being taught things. As it learns over time, the AI should get better and better at recognizing what people want. According to its creators, it will also soon have the ability to understand synonyms!^{1,2}

“

This is unprecedented. No one out there is using this AI Watson technology with natural language question-and-answer with the consumer. We think this is game-changing. ”

— Cal Bouchard,
Senior Director of e-commerce at The North Face³



¹ <http://www.vfc.com/news/company-news/detail/14593/using-the-impersonal-to-personalize-the-shopping-experience>

² <http://www-03.ibm.com/press/us/en/pressrelease/48479.wss>

³ <https://venturebeat.com/2016/03/04/the-north-face-to-launch-insanely-smart-watson-powered-shopping-app-next-month/>

Hot off the press

In February 2017, UPS made its first delivery using a drone in Florida. The drone was deployed from its charging and docking station on top of an electric delivery vehicle and successfully delivered a shipment to a customer's home. The eight-rotor delivery drone is capable of carrying packages weighing up to 10 lbs and flying autonomously for 30 minutes. While drone delivery currently faces regulatory challenges in the US, UPS estimates that it could save US\$50 million in a year using drone technology, employing it to deliver to remote locations in particular.¹

Drones or not, the global shipping market — said to be worth US\$2.1 trillion — could be the next golden opportunity for e-commerce companies.²

Further afield, JD.com is already looking at a deal that will see drones servicing 200,000 distribution points in rural China. So, even in remote areas, the impact of this technology is starting to be felt.

Visualize this... your very own virtual dressing room

With the right application of technology it's now no longer even necessary to imagine how a certain item of clothing

might look, or how a sofa would go with your furnishings at home. With augmented reality and remote product visualization technologies, companies are able to cut back on returns and customer dissatisfaction by creating virtual dressing rooms where they can try on clothes, or work out exactly how a piece of furniture, or an entire new kitchen, would look in their house.

Check-out becomes no check-out

The use of automation in retail isn't new. Vending and automation technologies were used in serverless restaurants as early as 1902 and the evolution of self-checkout technologies has been playing out in grocery stores over the last two decades.

We've come a long way and retailers are now testing the notion that in-store shopping doesn't have to mean choosing between assisted check-out or self check-out, or waiting in long lines. In fact it may not even require check-outs at all.

Both brick-and-mortar and online retailers are putting this hypothesis to the test and some suggest that no-checkout stores could be commonplace in the next 10 years.³

Disruptive retailers are revolutionizing the in-store customer experience, successfully applying technologies that reduce the amount of thought and time required of the shopper without compromising quality.



¹ <http://www.businessinsider.com/ups-tests-drone-delivery-system-2017-2>

² <http://www.businessinsider.com/ups-tests-drone-delivery-system-2017-2>

³ <https://www.forbes.com/sites/quora/2017/02/10/will-no-checkout-stores-like-amazon-go-be-commonplace-by-2025/#792662949465>

Another US bot that's only too happy to help will soon be seen in home improvement store chain Lowe's.¹ The bots will help manage inventory and show customers where to find products. The 5-foot tall NAVii machine can navigate itself through store aisles whilst avoiding obstacles, as well as greet customers, ask if they need help and walk them to the correct location. As NAVii robots can also be programmed to understand as many as 25 languages, it might not be long before your friendly service robot is also multi-lingual.²

Meanwhile, in Germany, fashion retailer Solebox has opened a new store in Berlin that employs a robot in the stockroom to collect shoes and deliver them straight to customers on the shop floor.³

Navigating the in-store maze

For anyone who has ever been lost in a store searching for that one item that eludes them, help is at hand. A new app, Ubamarket, can now arrange shopping lists into the order items appear in a particular shop. Shoppers make their list within the app then just select a participating store. The app then re-orders the items according to where they appear in the aisles.

Then, once shoppers reach the checkouts, they simply scan the app at a payment point and pay without having to load all their purchases onto the conveyor belt. Loyalty points can also be earned within the app and future editions will enable automatic payment via a pre-stored credit card.⁴

The robots that are born to serve

Meet Chloe. She smiles, says thank you and never has a bad day. She's also a robot.

American retailer Best Buy has employed Chloe to help customers at its Chelsea store in Manhattan. She sifts through music, movies and games, bringing you what you want quickly without the hassle of sorting through rows of shelves yourself.⁵



¹ <http://www.lowesinnovationlabs.com/lowebot>

² <http://www.fellowrobots.com/#NAVii™>

³ <http://retail-innovation.com/robot-working-in-german-shoe-store/>

⁴ <http://ubamarket.com/faq.html#question-list>

⁵ <http://www.par.com/material-handling/packaging-palletizing-systems/automated-retail-solution/>

Relate

The robots that learn from their mistakes

The modern customer now has extremely high expectations in customer service and one bad experience with your technology is all it takes to erode their loyalty. Different businesses have had different approaches as to how best to incorporate customer-facing technology, some with more success than others. After all, as we've already discussed with regard to supply chains, robots can add to the smooth running of something and provide a convenient service, but they can never fully replace the need for manual processes and human interaction... can they?

The fact is, robots are a great tool when it comes to freeing up human labor, and sometimes the most efficient way to solve a problem needn't actually be by talking to a real human being. Many automated services have been around for years, asking for your account number and details and reeling off options. Often this can be frustrating for customers, but with the introduction of software that can actually learn from your responses over time, perhaps the perfect balance between human and robot has been found?



I believe there is no deep difference between what can be achieved by a biological brain and what can be achieved by a computer. It therefore follows that computers can, in theory, emulate human intelligence — and exceed it. In short, the rise of powerful AI will be either the best, or the worst thing, ever to happen to humanity. We do not yet know which.



— Professor Stephen Hawking¹

¹ <http://www.mirror.co.uk/news/uk-news/stephen-hawking-says-artificial-intelligence-9086652>

Your at-home personal assistant

Social robotic technologies like Jibo are another way that the retailer/consumer relationship is being transformed, allowing businesses to interact with customers in their homes.

Mobile apps and convenient delivery already make our lives far easier. But what if you could talk directly to your very own at-home personal assistant? That's what robots like Jibo are offering — and it may not be long before robots in your home, ordering your pizza or reading your kids a bedtime story, are the norm.

Human or robot? Can you tell the difference?

Robots are successfully integrating themselves into every part of our daily lives. They can pick out your shoes, find you a job, and even read your body language. Hitachi's automated customer-service bot can not only recognize its environment and approach customers that need help, but even learn new behavior and information and share this with its fellow bots.¹ But what does this mean for us mere mortals?

Well, firstly, bot technology is not, as yet, infallible. It took just 24-hours for Microsoft's chat bot Tay to become racist and sexist. Designed to talk like a teenager, Tay quickly fell victim to a group of Twitter trolls who fed her offensive messages. Which gives rise to a major point regarding this type of tech — humans are unpredictable and the bot can only act on the quality of the information it is given. Despite this glitch, Microsoft remains confident that the future lies with AI bots and is investing heavily in this area.

Introducing Amelia...

Amelia is an artificial intelligence platform that can understand, learn and interact in the same way a human would. Amelia can read natural language, understand context, apply logic, infer implications, learn through experience and (wait for it) can sense emotions!

Her skills mean that Amelia can quickly become an expert in any field. Enfield council in London has already employed her to help residents find information and complete the initial steps in standard applications such as planning permission.³ IPsoft, who created Amelia, say of her capabilities:

"She determines how to resolve a problem based on knowledge of the topic and process involved. If Amelia cannot answer a question, she will alert a human colleague, observe the following interaction and learn how to respond to comparable questions in the future."⁴

Functioning as an extension of a company's existing workforce, Amelia has the ability to transform what's possible in the workplace. It's hoped that by completing the more tedious tasks within a business Amelia will free up her human colleagues so they can concentrate on higher-value work that drives up quality levels, productivity and service.



There have been concerns about the long-term prospect that we lose control of certain kinds of intelligences. I fundamentally don't think that's going to happen. I think that we will be very proactive in terms of how we field AI systems, and that in the end we'll be able to get incredible benefits from machine intelligence in all realms of life, from science to education to economics to daily life.



— Eric Horvitz,
Technical Fellow at Microsoft & MD
of Microsoft Research²

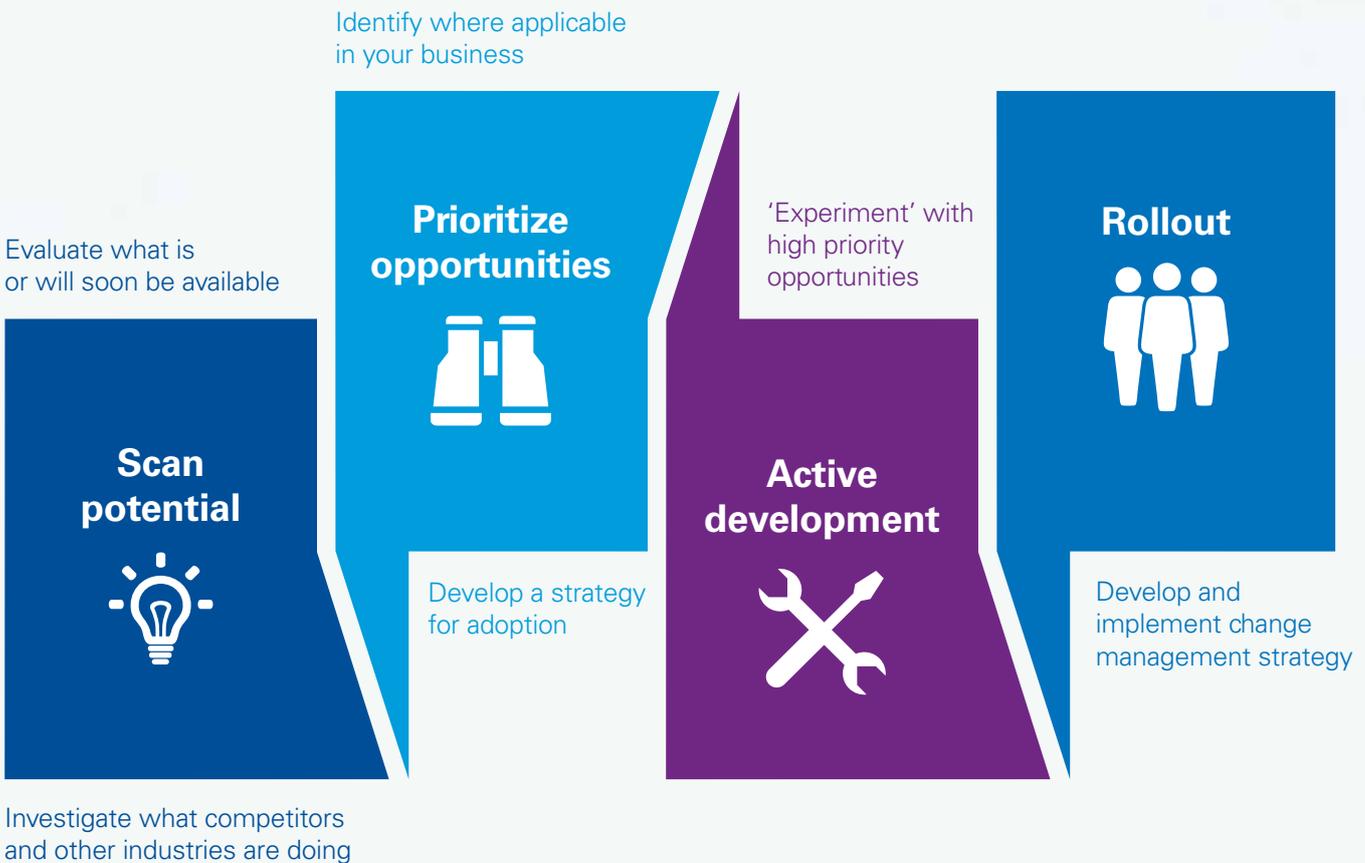
¹ http://www.hitachi.com/rd/portal/highlight/robotics/emiew3_01/

² <http://www.bbc.com/news/technology-31023741>

³ <http://www.ipsoft.com/2016/07/18/first-public-sector-role-for-amelia-as-enfield-council-deploys-her-to-boost-local-services/>

⁴ <https://www.theguardian.com/technology/2016/sep/18/chatbots-talk-town-interact-humans-technology-silicon-valley>

How to get started



Think big — start small — act now

Agreeing on what you are setting out to achieve is only the first step. Setting a vision which is right for your organization about where you want to play and why will leave the not so small challenge of actual implementation. The key to integrating the right tech into your business model is a

staggered approach. 'Test, move on. Test, move on.' should be the mantra of any company looking to strengthen its technological capabilities. Implementing an overhaul of your entire business model in one go is risky. A safer approach for many businesses is to stay more agile — able to define the right areas of capability in which to test innovations, whilst simultaneously remaining focused on your core business.

Use data and insight to prioritize

The pace of change is fast and multiple consumer demands mean you're likely to be stretched several ways at once. That's when data and fact-based insights can be used to prioritize a more varied and dynamic portfolio of projects. It's far easier to place your bets when you've got hard facts to go on.

Take a twin track approach

For some organizations, such as fashion retailers, this prioritization approach may simply be too slow. When trends change so quickly, organizations have to be able to respond accordingly. The old static 5-year plan is no longer relevant in an ever-changing environment. In some cases, this may mean adopting a twin track approach. For example, creating a traditional longer-term infrastructure program, alongside a network of 'innovators' who deliver an agile, continuously evolving customer offer.

The biggest challenge facing organizations will be creating alignment among senior leadership about what to do and why.

To do this effectively executive teams will need to:

1. Evaluate what cognitive technologies are available and are likely to become available in the near future.
2. Investigate how your competitors use automation and what the implications will be if they beat you to the punch.
3. Look for areas within your business that may be suitable for automation — not just those that are routine and repetitive, but those in which you are looking to create/maintain a competitive advantage.
4. Develop a strategy for technology transformation that considers opportunities, challenges and risks.
5. Experiment with automation, both alongside and in place of human workers.
6. Develop a change management strategy to demonstrate the value of automation to your workforce, address automation anxiety, overcome organizational resistance and speed up adoption.

Making it work: The human impacts

There's no doubt that the current technological revolution is a time of great innovation and excitement. But, for many, it may also paint a more worrying picture of the future where armies of unemployed drift from one menial task to the next. The UK's Channel 4's recent TV series 'Humans' has already taken this thread and run with it. And, historically, science fiction writers have always focused on the more negative aspects of the machine revolution. But in the same way that the Industrial Revolution transformed society for the better, so the rise of robotic technology has the potential to change not only the face of retail but the face of the planet.

However, from a retail point of view, it's also worth remembering that humans will always be humans. There will always be consumers that resist certain technologies; e-reader sceptics who prefer the feel of a physical book and music lovers who revert to vinyl records. The trick is to remember that one size rarely fits all. Because ultimately, we're not machines.

Cultural shift

The move towards a constantly evolving, tech-enabled business model represents a significant cultural shift. It can be a frightening prospect for many businesses that prefer to cling to the 'way we've always done it' mentality. But business leaders can, and must, change their mind-set if they want to compete for market share. Standing still is simply no longer an option.

Social impact

The social impact of this new future is inevitable. As robotic capability improves and replaces much of our back-office work and manual labor, businesses will have to look to redeploy and retrain its talent. But there's certainly room for balance with many organizations choosing to optimize their activities with technology that works in conjunction with human insight.

Change capability

An organization's capability — and capacity — to execute change is critical in today's fast-moving environment. This

is where the customer value proposition, leadership style and operating model must come together to deliver your end goal in a consistent and compelling manner. Change capability will become an even bigger determinant of business success than it ever was.

“

Creativity is a big part of cognition... when machines can do that, maybe we will be obsolete. But until then — and I think that's some ways off — I think we have a big future for human beings to do lots of interesting things in the realm of work. ”

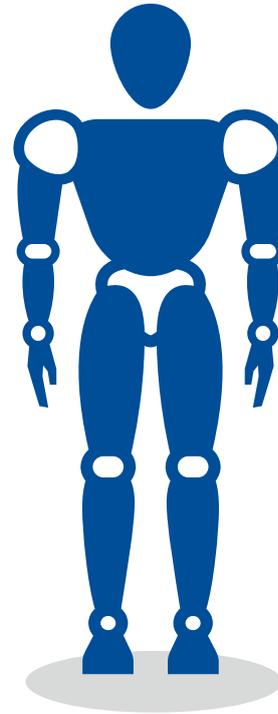
— Constance Hunter,
Chief Economist, KPMG in the US

Conclusion

The robots are coming! It can sound like a frightening future, but it doesn't need to be. Change for any organization is always challenging, but when the rewards are many and various, it makes no sense to stand still.

We've seen how this future touches every part of the value chain, and how companies are responding. Ultimately, it will be for each individual business to work out what's right for its people, culture and customers. Business leaders now have a vast technological arsenal at their disposal. How they choose to deploy it will determine whether they become a viable business of the future.

Whatever the technological advancements however, one basic rule of commerce endures — the customer is king. Especially when that customer is armed with tech of their own and expects to get what they want faster, cheaper and in more ways than ever before.



Globally, we are working with many leading retail and consumer organizations to help them make the difficult choices that need to be made.

We do this by not only deploying our own deep expertise, but also through a number of partnerships we have with leading AI providers such as IBM Watson and Microsoft Blockchain.

So we know the robots are coming. It needn't be a frightening environment for those armed with the right strategies.

If you need help navigating your way through the technological changes to come, talk to KPMG.

This report was originally produced by KPMG Boxwood.

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