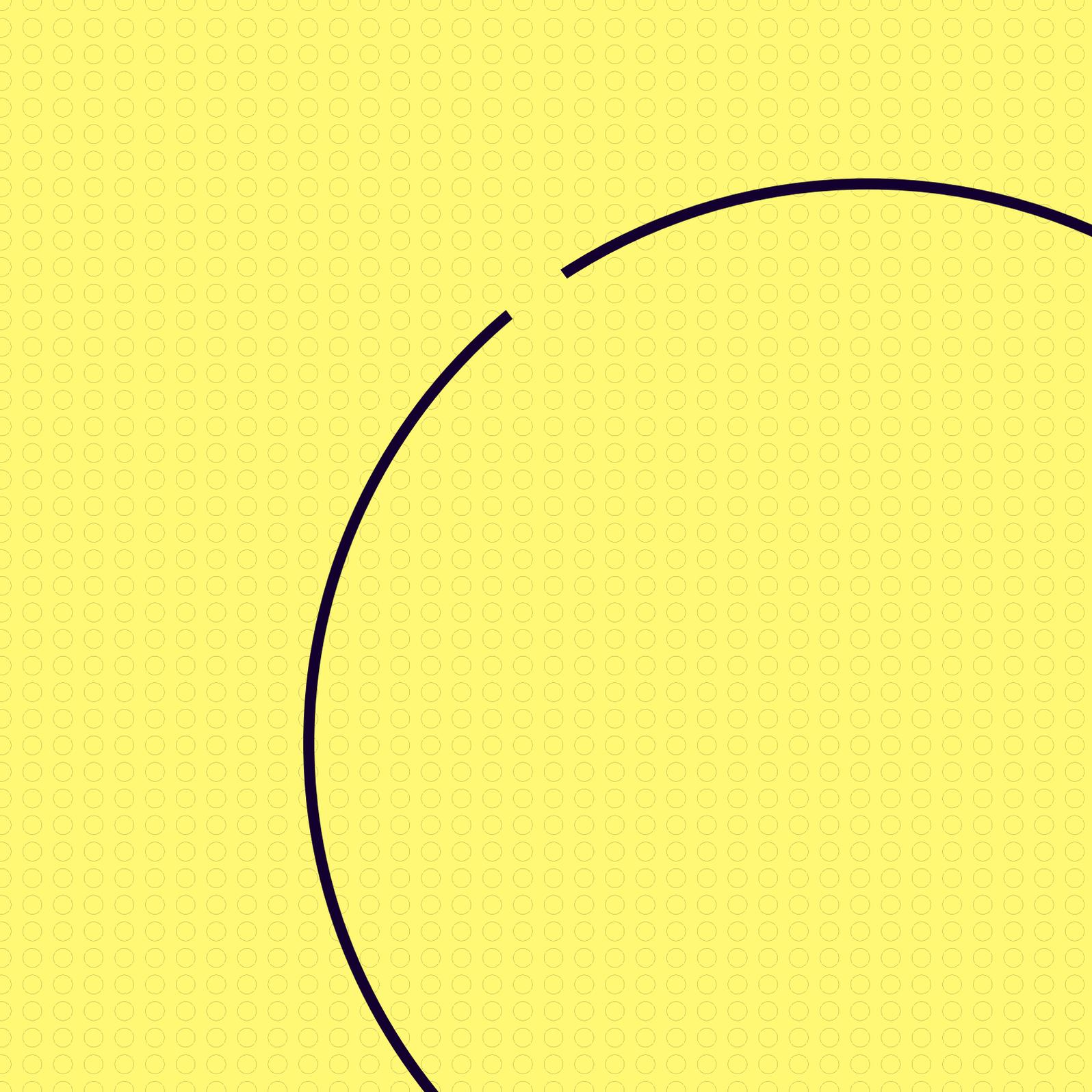


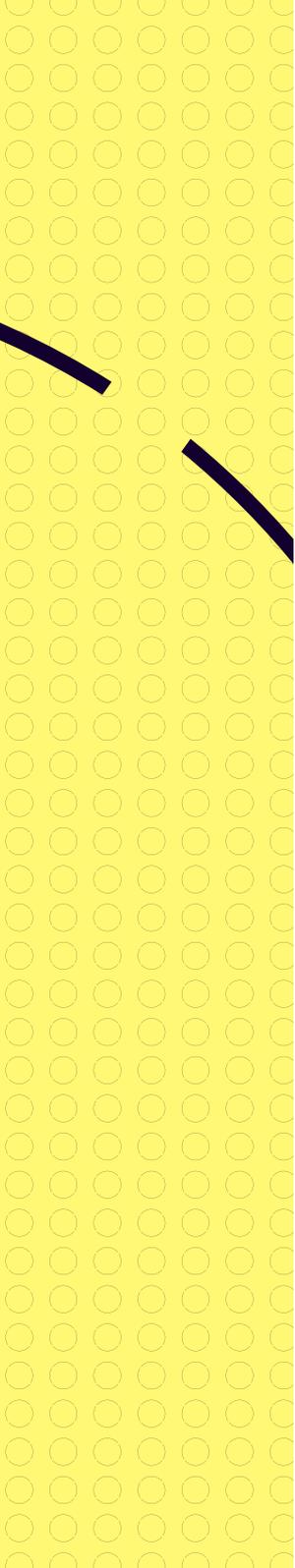
VOLUME.XO
Leaders in Cognitive Computing

ISSUE 1

RETHINK!
RESPONDING
TO THE FOURTH
INDUSTRIAL
REVOLUTION

| **With**
Watson™





RACING FOR A REVOLUTION

– one with no finish line

You're running a marathon at full pace. Faster than you've ever sprinted before. The world flies past as you move, other contestants creep up, yet despite your momentum you must change your shoes every mile; the road is burning holes in their soles, and your fellow athletes are doing the same, so it's the only way to compete and protect your feet. Still, step out for a second and you'll fall behind.

Welcome to business today.

Never before has data grown at such a rapid rate. Never before has technology advanced at the speed it's evolving right now. Never before have we stood at the brink of exponential breakthrough, the edge of the unknown, unaware of the disruption about to be brought about by robotics, the Internet of Things, autonomous vehicles, 3D printing, nanotechnology, biotechnology and quantum computing. Never before has it been more vital to plug in, skill up and get ahead.

And your organisation sits in the crossfire of this newly waged war – the battle between the physical, biological and digital that's set to see all three fuse. The Fourth Industrial Revolution.

BECOMING A CHAMPION OF CHANGE

Future-proof your business, or fall behind

In 1784, the First Industrial Revolution brought about production powered by steam and water. The Second saw the division of labour, the use of electricity, and mass manufacturing. The Third? Electronics, IT and automation. But although we still sit in this digital era, another is approaching: the Fourth Industrial Revolution. It is a revolution of innovative systems, set to dramatically change the way we work, play and live.

Artificial intelligence (AI) is already making its mark, through self-driving cars, drones and virtual assistants. These developments are starting to show gaps in our skillsets and the knowledge we'll need to survive in tomorrow's business environment.

TOP 10 SKILLS¹

in 2020

1. Complex problem-solving
2. Critical thinking
3. Creativity
4. People management
5. Coordinating with others
6. Emotional intelligence
7. Judgement and decision-making
8. Service orientation
9. Negotiation
10. Cognitive flexibility

in 2015

1. Complex problem-solving
2. Coordinating with others
3. People management
4. Critical thinking
5. Negotiation
6. Quality control
7. Service orientation
8. Judgement and decision-making
9. Active listening
10. Creativity

In fact, a recent World Economic Forum report highlighted the top 10 skills our workforces will require in 2020, compared to those desired in 2015. Though complex problem-solving is set to remain the number-one priority, there's a seismic shift in others – with creativity making its way into the top three, along with critical thinking.¹

These are talents that technology just can't replace – yet. But by combining some of these human skills with ones that intelligent machines can match, or better, your business could innovate faster than ever; become agile enough to overthrow even your biggest competitors; and find exciting new ways of enhancing your product and service offering with truly data-driven decisions.

The question is, how can you best prepare for the Fourth Industrial Revolution? How can you ensure you have the technology in place that will empower you to embrace it once it arrives? How can you get ahead by putting some of these advancements in place today, ready for tomorrow?

The answer lies in understanding. It's critical we consider the technologies fuelling the game-changing transformation that's just around the corner, and how we can adopt these to future-proof our organisations. And there's no doubt about it: one cutting-edge catalyst is cognition.¹

Did you know?

Five years from now, over a third of skills (35%) that are considered important in today's workforce will have changed.¹

¹ http://www.weforum.org/agenda/2016/01/the-10-skills-you-need-to-thrive-in-the-fourth-industrial-revolution?utm_content=buffer5c2cc&utm_medium=social&utm_source=twitter.com&utm_campaign=buffer/

COGNITION

/kɒg'nɪʃ(ə)n/ noun;

The mental action or process of acquiring knowledge and understanding through thought, experience and the senses.

I INTRODUCING COGNITION

With IBM Watson

Believe it or not, the story of cognition starts in the late 19th century – when mathematician George Boole laid the foundations for cognitive computing in his book, ‘The Laws of Thought’, and polymath Charles Babbage proposed creating what he called an ‘analytical engine’.

The term ‘Artificial Intelligence’ (AI) was coined by computer scientist John McCarthy in 1955, and defined as ‘the science and engineering of making intelligent machines’.

Then, in 1997, IBM was identified as the true pioneer in the field, when its cognitive-computing system – Deep Blue – beat Garry Kasparov, the current world chess champion.

Since then, everything has changed. Well, almost everything.

Although today’s smart machines are more than just game-playing gadgets, IBM is still the industry’s innovator. And its most impressive work to date lies in Watson.

WHAT?

IBM Watson is the world's first computer system capable of answering questions posed in natural language.

WHERE?

Watson's new global headquarters are located at 51 Astor Place, part of New York City's Silicon Alley. Entirely cloud-based, the system can be accessed anywhere, at any time.

Did you know? IBM Watson uses more than 100 different techniques to analyse natural language, identify sources, find and generate hypotheses, and score evidence.²

WHEN?

2007

Work begins on IBM Watson.³

February 2010

IBM markets its IBM Power 750 servers, on which Watson is based.⁴

February 2011

Watson beats *Jeopardy!* champions Ken Jennings and Brad Rutter, live on television.⁵

August 2011

The Watson business unit is established.⁵

January 2013

Rensselaer Polytechnic Institute becomes the first university to receive a Watson computer.⁶

² <http://www.wired.com/2014/03/ibm-watson-powered-mobile-apps-can-reinvigorate-brick-mortar-retailers/>

³ <http://www.techrepublic.com/article/ibm-watson-a-shining-example-of-how-to-take-big-data-to-the-next-level/>

⁴ <http://www-03.ibm.com/systems/uk/power/solutions/watson/>

⁵ <http://www.techrepublic.com/article/ibm-watson-the-inside-story-of-how-the-jeopardy-winning-supercomputer-was-born-and-what-it-wants-to-do-next/>

⁶ <http://news.rpi.edu/luwakkey/3126>

November 2013

IBM announces that it will make Watson's API available to software application providers, enabling them to use it in building apps and services.⁷

February 2014

It is reported that IBM plans to invest \$100 million in a 10-year initiative in which Watson will be used to help countries in Africa to address development problems.⁸

June 2015

Volume becomes one of only a handful of UK companies to start working with IBM Watson. We finish the prototype of the Virgin Media Business Virtual Consultant in a matter of weeks.

September 2015

IBM announces new APIs that extend language, vision and speech capabilities.¹¹

October 2015

IBM launches the industry's first consulting organisation dedicated to helping clients realise the transformative value of cognitive business.⁹

Volume begins developing a top-secret cognitive application for another client.

December 2015

IBM opens its global headquarters for Watson Internet of Things (IoT), launching a series of new offerings, capabilities and ecosystem partners designed to bring cognitive computing to connected devices.¹⁰

January 2016

Volume kicks off the creation of Gloop™, a cognitive employee-wellbeing application powered by IBM Watson.

Mid-2016

IBM is set to open Watson West, a new hub in San Francisco.¹¹

⁷ <http://www.forbes.com/sites/bruceupbin/2013/11/14/ibm-opens-up-watson-as-a-web-service/>

⁸ <http://www.reuters.com/article/2014/02/06/us-ibm-africa-idUSBREA1507H20140206>

⁹ <http://www-03.ibm.com/press/us/en/pressrelease/47785.wss>

¹⁰ <http://www-03.ibm.com/press/us/en/pressrelease/48443.wss>

¹¹ <http://www.fastcompany.com/3051421/watson-is-coming-to-silicon-valley/>

HOW?

ANALYSES UNSTRUCTURED DATA

Uses natural language processing to understand grammar and context¹²

UNDERSTANDS COMPLEX QUESTIONS

Evaluates all possible meanings and determines what is being asked¹²

PRESENTS ANSWERS AND SOLUTIONS

Based on supporting evidence and quality of information found¹²

MORE-THAN-MODERN MARKETING

With their ability to process and create content, cognitive-computing systems – such as IBM Watson – may well replace roles in marketing agencies... right?

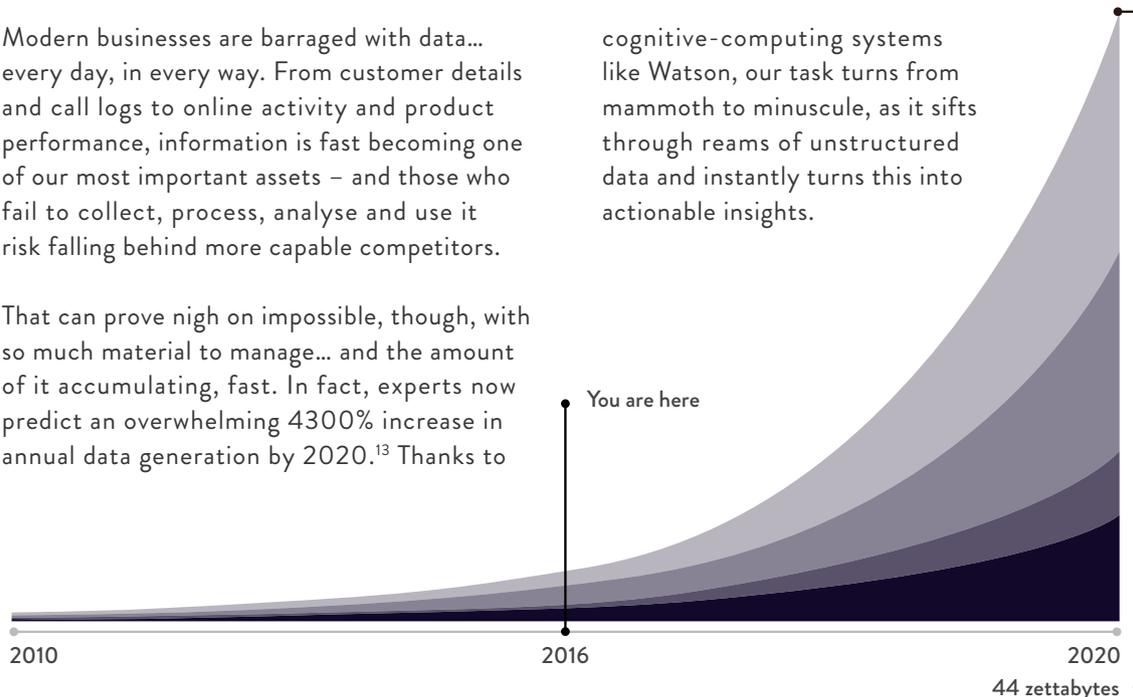
Wrong. The service we mere mortals provide is still superior – but will be enhanced by the introduction of these machines. Here's how.

RIDING THE WAVE OF BIG DATA

Modern businesses are barraged with data... every day, in every way. From customer details and call logs to online activity and product performance, information is fast becoming one of our most important assets – and those who fail to collect, process, analyse and use it risk falling behind more capable competitors.

That can prove nigh on impossible, though, with so much material to manage... and the amount of it accumulating, fast. In fact, experts now predict an overwhelming 4300% increase in annual data generation by 2020.¹³ Thanks to

cognitive-computing systems like Watson, our task turns from mammoth to minuscule, as it sifts through reams of unstructured data and instantly turns this into actionable insights.



¹³ http://www.csc.com/insights/flxwd/78931-big_data_universe_beginning_to_explodeexplode/

PUTTING PERSONAS IN THE PAST

These insights, drawn from every single byte of information about each one of your customers, will ensure that we invest in projects and campaigns wisely. After all, why guess whom you're targeting, where their interests lie, and the sort of content they'll care about most?

As a matter of fact, in many instances, Watson is already working in this way... but more to satiate curiosity than to maximise profit. Did you know, for example, that you can now discover which celebrity you're most (and least) similar to according to your Twitter posts?¹⁴ Or that Watson can pick apart your personality just by reading your writing?¹⁵ Take a look online and see what the system has to say about you!

GETTING PERSONAL

Imagine chatting live with a customer-service representative who knows the details of all your historical purchases from their company, any interaction you've had previously, and how to assist you with your query. This scenario is commonplace today, as personnel man support desks and use databases to keep tabs on us.

Pretty soon, though, those centres may be unmanned – as we speak to an intelligent machine instead, using natural language, receiving replies with personality and pizzazz.

STRETCHING THE SELF-SERVICE CYCLE

Human interaction isn't the only way we currently receive the help we need. If you've ever encountered an automated chat pop-up on a website, or an interactive 'frequently asked questions' page, you'll know that we already take advantage of self-service solutions that field questions for us. They ask what we're looking for, and provide answers. But do they truly understand our needs, and give us the exact information we're seeking? Not really.

With cognitive computing, that's all set to change, as systems capture unstructured data and give it meaning. By working out what customers actually want, machines can direct them to relevant teams, armed with more knowledge and the ability to make better-informed decisions.

¹⁴ <http://your-celebrity-match.mybluemix.net/>

¹⁵ <http://watson-um-demo.mybluemix.net/>

ON DEMAND. ON TARGET.

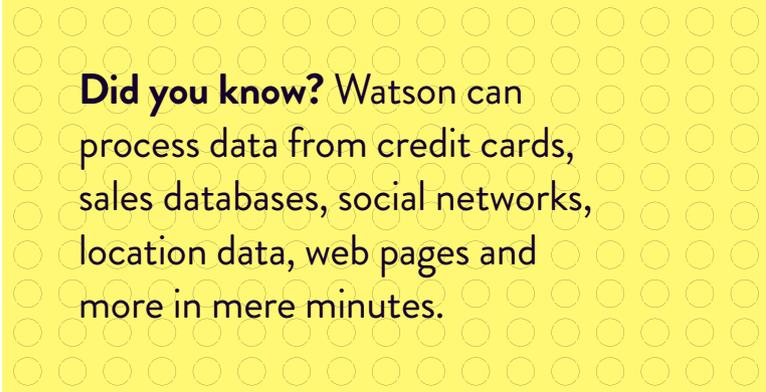
Today's consumers expect content on demand, from albums to articles. Soon, we'll be able to feed their desires by providing instant, round-the-clock access to the marketing materials they really want. What's more, we'll be able to analyse their habits; discover which customers are most profitable to our business; and understand why.

NOTHING TO SHOUT ABOUT

This means that in a world where we're constantly bombarded with information and adverts, cognitive computing will cultivate calm. No longer will email trash folders fill up, or recycling bins overflow. Consumers will be in control of our communications. Forget about 'throw enough mud and some of it will stick' – this is the future.

RECOMMENDATIONS THAT RESONATE

Plus, with computers handling an enormous – no, unthinkable – amount of data, we'll use it to suggest products and services that consumers could really use.



Did you know? Watson can process data from credit cards, sales databases, social networks, location data, web pages and more in mere minutes.

TOMORROW'S TRAINING, TODAY

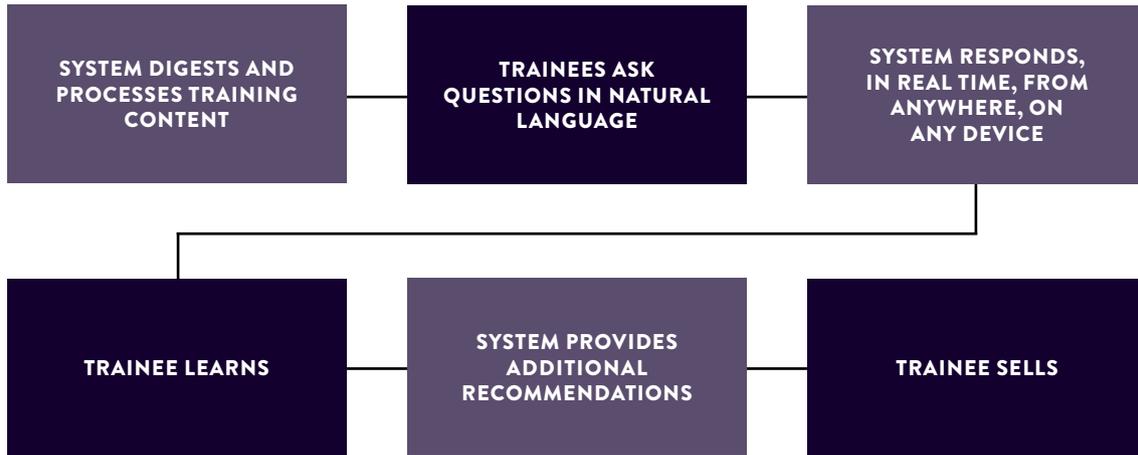
So, cognition is empowering us to master modern marketing. But there's another way it can come into play that may well optimise your operations: in learning and development.

That's because as cognitive-computing systems like IBM Watson process information themselves, they can teach too... acting as a cognitive learning platform, and building curriculums personalised to each student, delivering know-as-you-go learning on any topic and every device.

And by 'every device', we're not just talking mobiles and tablets. Soon, students could receive nuggets of knowledge via their wearables, and learners could find themselves thrust into dangerous, or even deadly, situations – taking part in training that simply wouldn't be possible in real life, using virtual-reality headsets that can transport them to anywhere from deep space to the deep sea.

What's more, applications – such as sales-optimisation tools – can be built on this platform. These applications can suggest next steps in the sales cycle; propose products to push next; and recommend ways to boost customer satisfaction, based on the last query submitted by the user.

Let's say, for example, a consumer purchases a dress. Watson could take information on its style and colour, and offer shoes or handbags that coordinate. Not only will the customer look great... but the sales representative, and business, will too.



BETTER FOR DEVELOPERS

So, what does this mean for those who create learning and development solutions and the content that populates them?

Once they've 'taught' the system everything their trainees need to know and worked with tech experts to develop an interactive interface, the most tedious part of their job is done.

That means no more fielding queries. No more deciphering documents. No more carving out content and sifting through storyboards.

Instead, they can focus on bettering the user experience; reporting; performing analytical research; and putting strategies in place based on these invaluable insights. Now that is doing more with less.

BETTER FOR TRAINEES

Millennials. Generation Y. Whatever you call those employees born between 1980 and 2000, no doubt you know about them... and how different their expectations of, and needs in, the workplace are from those who came before.

Digitally minded and demanding, they want to learn, progress and succeed... fast. And if they don't, they'll look elsewhere for options that cater for their ambitions. In fact, research finds that two thirds of millennials plan to leave their current organisation by 2020; a quarter see themselves elsewhere within the next year;¹⁶ and almost 25% of all employees leave their job due to a lack of training or learning opportunities.¹⁷

With cognitive computing, this generation can take advantage of training that suits them. Instantly and easily accessible at all times and on any device, including wearables and virtual-reality headsets, content is tailored to them, and learning seamlessly slots into their often-irregular schedules.

To learn more about how artificial intelligence is enhancing education, [click here](#).

BETTER FOR SALESPEOPLE

Forget about leaving leaflets with customers, putting together pitches and presentations, and battling boring brochures.

Using cognitive-computing systems, salespeople are able to learn what they need to know about products and solutions on their terms – even asking queries in their own words during meetings using their smartphone or tablet.

This frees up resource on the road, impresses customers, increases satisfaction and – most importantly – assists in securing sales.

Volume is proud to have launched the Virgin Media Business Virtual Consultant powered by IBM Watson – the UK's first app of its kind – which sees friendly avatar Theodore deliver training modules to the company's sales teams via an app for mobile, tablet and desktop. Theodore can answer questions in natural language, real time, and his own cheeky tone of voice, with users contributing to his responses' confidence scores so he can become even better.

I TRANSCENDING VERTICALS

No doubt you've already brought to mind many other ways in which Watson could work... and is, in many cases, already working. Here are just a few more:

HEALTHCARE

According to experts, only 20% of the knowledge doctors use to make decisions on diagnosis and treatment is evidence-based. That may be why one in five diagnoses are incorrect or incomplete.¹⁸ With Watson, physicians can pose a query or describe symptoms. The system then instantly explores patient data – taking into account factors including family history, any medications the patient is currently taking, and existing conditions. It combines this information with current findings, such as test results, and both its pre-learned and online intelligence, to provide a list of potential diagnoses... along with a score that indicates its level of confidence in each hypothesis.

LEGAL

Have you heard of a Canadian lawyer called Ross? The chances are, there are hundreds – perhaps thousands – out there. The Ross we know of is unique, though, in that he has no surname, no face... and no moral bias. In truth, Ross is a cognitive-computing platform, powered by Watson and developed as part of the 2015 Watson University Competition by a team from the University of Toronto.¹⁹ Having come second in the competition, the student entrepreneurs who built it have decided to turn their project into an independent start-up.

¹⁶ <http://uk.businessinsider.com/why-millennial-employees-are-quitting-2016-1?r=US&IR=T>

¹⁷ <http://blogs.skillssoft.com/learning-re-imagined/2014/04/who-should-truly-be-the-owner-of-the-learning-culture-.html>

¹⁸ http://www-05.ibm.com/innovation/uk/watson/watson_in_healthcare.shtml

¹⁹ <http://www.psfk.com/2015/01/ross-ibm-watson-powered-lawyer-legal-research.html>

Ross is showing us the opportunities Watson is opening in the world of law. Effortlessly sifting through thousands of documents, statutes and cases, Ross can answer legal questions; suggest articles for further reading; and calculate confidence ratings to help lawyers prepare for cases. What's more, it learns from past interactions, with its responses growing more accurate the more it is used.

RETAIL

When was the last time you shopped in a physical store? It's unsurprising if you're struggling to remember – considering e-commerce is the fastest-growing retail market in Europe,²⁰ and online shopping spend has overtaken that of physical stores in the US²¹ and the UK²² for several years now.

This digital disruption is causing retail brands to cut costs and close branches. And this trend may continue. Or it may not, with technologies such as Watson reinvigorating the in-store experience.

Set to support personal-shopper apps that can answer questions about what consumers should buy, from where, and when – as well as apps that can provide retail salespeople with cross- and upsell opportunities – Watson might just change the way we make purchases, and the way retailers drive brand engagement.²³ After all, wouldn't you be more inclined to buy that barbeque if Watson told you the weather was sure to be sunny the next weekend?

EDUCATION

One of the areas in which cognitive computing systems are making perhaps the biggest impact is education. From providing decision support for teachers – coupling students' goals and interests with information on their learning styles – to predicting performance and learning needs,²⁴ such systems are acting as a catalyst for truly personalised classrooms and educational experiences.

In fact, as you read this, American college students are taking classes using machine-learning software called ALEKS.²⁵

²⁰ <http://www.retailresearch.org/onlineretailing.php>

²¹ http://www.huffingtonpost.co.uk/2012/12/13/online-shopping-spend-bea_n_2293967.html

²² http://www.webloyalty.co.uk/News/ukrs_online_shoppers_saving_200_million_miles_of_shopping_trips

²³ <http://www.wired.com/2014/03/ibm-watson-powered-mobile-apps-can-reinvigorate-brick-mortar-retailers/>

²⁴ <http://www.research.ibm.com/cognitive-computing/machine-learning-applications/decision-support-education.shtml#fbid=u4CSlcsM7zP>

And in Georgia, USA, the Personalised Education Through Analytics on Learning Systems (PETALS) project is using this technology to create tailored learning plans for 170,000 pupils in 132 schools.²⁶

CULINARY

If you've browsed a bookstore or even perused an app store recently, you may have stumbled across Watson's first cookbook – 'Cognitive Cooking with Chef Watson' – or the free Chef Watson app.

That's right: after a three-year collaboration between IBM Research and chefs at the Institute of Culinary Education (ICE), Watson has produced a range of dishes – 65, to be precise – by extracting and using data about dish types; cooking styles; human psychology; taste preferences; feedback and oversight from chefs and diners; and more.²⁷

And the app takes your requested meal, cooking style and ingredients to concoct a recipe based on its knowledge of flavours that pair well. Delicious!

Did you know? Watson has indexed the entire library of TED Talks. Soon, we'll be able to ask TED.com complex questions in natural language, with Watson directing us to specific segments within videos where relevant ideas are discussed.²⁸

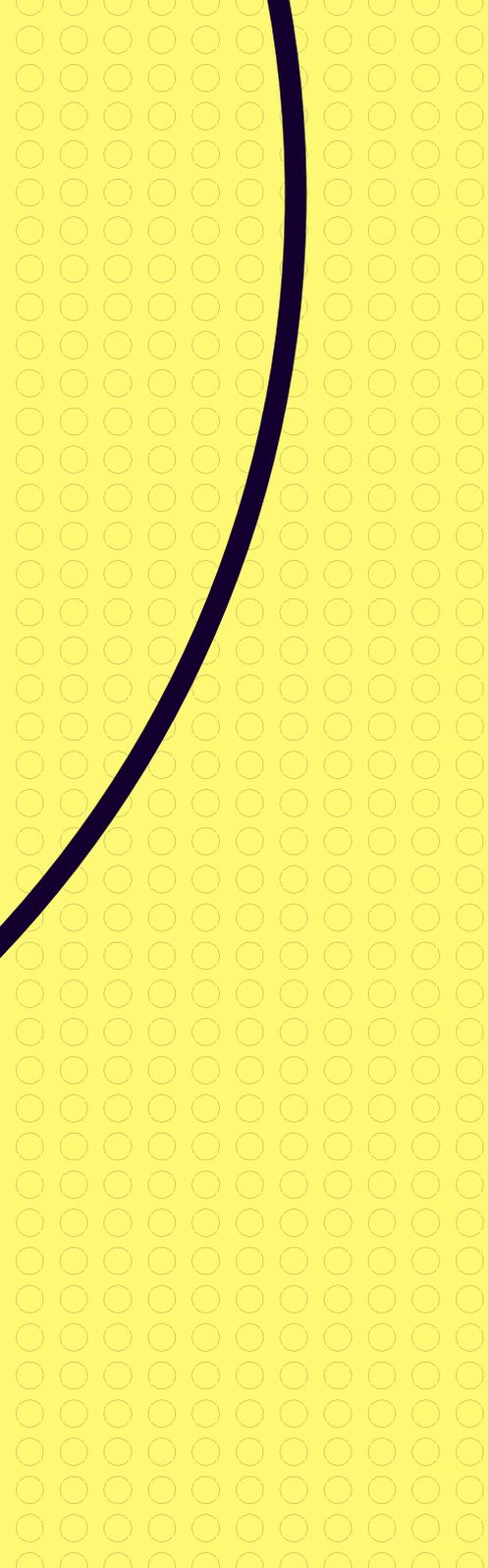
²⁵ http://www.slate.com/articles/technology/technology/2015/10/adaptive_learning_software_is_replacing_textbooks_and_upending_american.html

²⁶ <https://gigaom.com/2013/12/19/ibms-personalized-e-learning-project-knocks-off-one-of-its-5in5-predictions/>

²⁷ <http://www.gizmag.com/ibm-cognitive-cooking/36956/>

²⁸ http://blog.ted.com/ted_ibm_watson/

**NOW FOR SOMETHING
EXTRAORDINARY:
VOLUME.XO**



Volume is committed to innovation, and Watson provides the perfect path to progression. As we strive to meet our goals and bring the benefits of Watson to businesses worldwide, we're proud to introduce our Centre of Excellence for Cognitive Computing, Artificial Intelligence and Machine Learning: Volume.XO.

'XO', which stands for 'extraordinary', is truly an apt word to describe IBM Watson; its transformational capabilities; and also the Volume.XO team, which comprises consultants and experts in cognitive technology. Together, we are working to drive the new era of computing as an IBM Watson Ecosystem Partner.

To learn more about Volume.XO, or to discover how we could use Watson to positively disrupt your organisation, read our Volume.XO iPaper [here](#), view our presentation [here](#), or contact Aidan Murphy on **+44 (0)118 936 2038** or aidan.murphy@volumeglobal.com.

TO SUM UP

Cognition may be driving the Fourth Industrial Revolution. But you can take control. By investigating what cognitive computing could bring to your business, you're preparing yourself for the future – and although we may not know exactly how technology will evolve tomorrow, deploying artificial intelligence today is undoubtedly a move in the right direction.

Whether you're seeking the machine learning to create training tools that skill up your workforce with know-as-you-go knowledge; to innovatively improve the customer experience by automating the first touch or extending the self-serve cycle; to engage your employees with exciting virtual-reality training; or to achieve something else altogether, Volume.XO can help. Get in touch now, and join us on our journey of opportunity and optimisation.

Copy written by Brooke Charlesworth, Senior Copywriter, Volume



Chris Sykes 
Founder and Chief Executive of Volume
www.volumeglobal.com

Cognitive computing is set to become the next big thing in business. And Volume is already innovating with this technology, using IBM Watson in two ways.

The first way is creating ‘virtual assistants’ or ‘cognitive consultants’ to extend the self-serve cycle, and to deliver a controlled and consistent brand experience via a web or mobile interface or through a contact centre. Automating the first touch provides an organisation with the opportunity to deliver 24/7 customer service and sales opportunities without the cost of human resources.

The second way is delivering Cognitive Learning Management Systems that negate the need for developing pre-compiled training content, typically e-Learning modules and the sales-ready lag associated with taking training online or in the classroom. Users adopt a

know-as-you-go methodology by dynamically asking questions in natural language, be they technical, commercial, or product- or service-related. The system learns with each question and interaction, which dynamically builds a significant real-time and real-life scenario knowledge pool, available 24/7.

We may not know for sure what artificial intelligence will empower us to do next, but by investigating its possibilities today, we’re able to get a head start on tomorrow.

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