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Work smarter, not harder



We have a mantra at BusinessCloud which shapes everything that we do: work smarter.

From cloud-based workflow platforms to social media schedulers and auto-transcribing website Otter.ai, we make use of many tools to deliver content to our readers.

And when we set up an interview with a company, the first question we ask ourselves is 'how can we use this'? Does it suit a podcast? A feature for our daily newsletter? Can it feed into the magazine? Or perhaps all three?

In the world of business, start-ups, in particular, are time-poor: even the most capable founding teams need all the help they can get to turn their great idea into a sustainable venture. Luckily the rapid advance of technology means there are many options out there for forward-thinking firms seeking business intelligence.

Our 100 SmartTech Innovators ranking (p9) showcases some of the resources available using data analytics and monitoring technology. Our No.1-ranked company Mobica, for example, is blazing a trail with software to transform sectors as diverse as automotive, silicon, FinTech, telecoms and media (p21). We spoke with CEO Simon Wilkinson about the Wilmslow firm's plans to grow both at home and globally.

Our special report on SmartTech (p32) offers further insight into how firms of all sizes can adopt smarter decision-making in both business processes and physical use of space. There is also a focus on the connected infrastructure driving smart city transformation; a theme again visited on p29 in our interview with German-headquartered multinational company Bosch.

Slanted Theory's Laura Smith guides us through the Sheffield firm's ALAIRA immersive visualisation tech (p38), used by the likes of Cisco to make sense of complex data sets, while in the Tech Counsel advice section on p74 we ask 'who is responsible for the data within a company?'

The endless Brexit debate inspired Turi Munthe to found a 'Wikipedia for opinions' (p4) as he realised that the various arguments could essentially be reduced down to fit on the back of an envelope. The former journalist met with Wikipedia founder Jimmy Wales to discuss his plan for Parlia, which has backing from the Google Digital News Initiative.

One company exposing counterfeit products on eBay is Digiseq. Its NFC tech is now scanned into every Golden Globe to ensure the provenance of awards claimed by the likes of Fleabag and Joker (p25).

'The Missing Cryptoqueen' is the fascinating story of Dr Ruja Ignatova, who vanished after her 'Bitcoin killing' platform OneCoin – which attracted billions of pounds of investment – was exposed as fraudulent (p46).

For our cover story we visited Abbey Road, home of The Beatles, to highlight how its Red incubator is continuing a 90-year tradition of innovation at the legendary studio – and hear how artificial intelligence could shape the future of music (p50).

Among several other start-up interviews, we hear how London's Humanising Autonomy is leading the drive to introduce safe autonomous vehicles into busy Western city centres (p71).

We also explain the rapid rise of co-working (p56) against the backdrop of WeWork's spectacular fall from grace and interview Silicon Valley giant Circle CI (p66), which is helping the likes of Facebook, Deliveroo, Monzo and Spotify continuously develop their platforms.

Enjoy the magazine.

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50



FEATURES

- 09 **100 SmartTech Innovators**
UK's leading smart technology creators revealed
- 41 **Tech 50**
Regional innovation ranking for the East of England
- 50 **Abbey Road Red**
Incubator at legendary music studio continues 90-year tradition of innovation
- 56 **The Explainer**
Collaborative working demystified in six questions
- 65 **UK tech investments**
Top 10 funding rounds in Q1
- 74 **Tech Counsel**
Whose responsibility is data in an organisation?

INTERVIEWS

- 04 **Parlia**
How Brexit debate inspired Turi Munthe to build 'Wikipedia of opinions'
- 21 **Mobica**
CEO Simon Wilkinson plans to grow software company internationally and at home
- 25 **Digiseq**
Using NFC tech to expose counterfeit products including Golden Globes
- 29 **Bosch**
Multinational firm's tech can help solve climate emergency
- 38 **Slanted Theory**
ALAIRA immersive visualisation tech used by likes of Cisco to make sense of complex data
- 42 **KisanHub**
Connecting companies such as global brewers with sustainable crops



- 60 **Revlifter**
Fast-growing firm using artificial intelligence to personalise deals for shoppers
- 66 **CircleCI**
Helping world's fastest-growing tech start-ups stay ahead of the competition
- 71 **Humanising Autonomy**
Rethinking how autonomous vehicles navigate busy streets in major cities

REPORTS

- 32 **SmartTech**
Experts offer tips on business intelligence, monitoring tech and connected infrastructure
- 46 **OneCoin**
Story of 'Missing Cryptoqueen' Dr Ruja Ignatova has ingredients of Hollywood movie

INSIGHT

- 64 **On the Money: Yasmina Darveniza**
"VC money flowing into UK AI start-ups has hit \$3.2 billion – but is it worth the hype?"
- 55 **Neil Lathwood**
"Data allows us to take automated decisions in real-time to protect clients"
- 76 **Gadget Gavin**
"CES turned 50 this year and is essentially a window into the future of technology"

BREXIT INSPIRES NEW 'WIKIPEDIA OF OPINIONS'



UK-BASED TECH ENTREPRENEUR TURI
MUNTHE HOPES PARLIA WILL MAKE
SENSE OF AN INCREASINGLY DOGMATIC
WORLD BY DOCUMENTING EVERY
OPINION ON EARTH

Words: Alistair Hardaker

As the Brexit vote loomed in June 2016, people were increasingly compelled to share their opinion on what would be the best decision for the country.

Endless hours of debate were broadcast across TV and radio. This then trickled down to pubs and dinner tables, where yet more hours of discussion would be held.

Entrepreneur Turi Munthe was not alone in observing that these conversations were often unproductive and, at times, descended into heated argument. But this is not another story about fake news: Munthe would take a wholly new approach.

"We've spent billions of words talking about Brexit and actually there's a very limited number of arguments," Munthe tells BusinessCloud. "The closer we got to June 23rd, the more I realised we'd been hearing the same arguments over and over and over again on all sides."

The 43-year-old Anglo-French journalist-turned-media entrepreneur and now VC had spent his career boiling complexity down into simplicity. By taking a step back, he realised that there were just a handful of opinions within the 'leave' and 'remain' camps on the likes of sovereignty, security and economics. It was possible to map all the major opinions on Brexit on the back of an envelope.

"What hit me was that if you could map something as complicated as Brexit, you could do the same for pretty much everything," he says.

This realisation would be the birth of Parlia, a project described as a 'Wikipedia for opinions' where both sides of an argument can be documented side by side. "When I first floated the idea of Parlia I went to speak to Wikipedia and, very gratefully, with Jimmy Wales himself," reveals Munthe. "The people there thought I was crazy to focus on the controversial topics. Those are the articles on which they do the most work for the least return."

Munthe believes Parlia will vary from Wikipedia in one fundamental way. Parlia's pages will categorise both – or all – opinions at once with equal weighting. "We don't need to come to a conclusion," he says. "All we needed to make sure is that the descriptions of these arguments are fair and are not inflammatory."

Munthe began his career as a freelancer, writing about Middle Eastern politics after dropping out of a PhD on the topic from New York University. He then founded Demotix in 2007. It would become the biggest network of photo journalists in the world and be acquired by the Bill Gates-owned Corbis in November 2012. Demotix allowed photographers and video journalists of any skill level to sell their content to major media outlets.

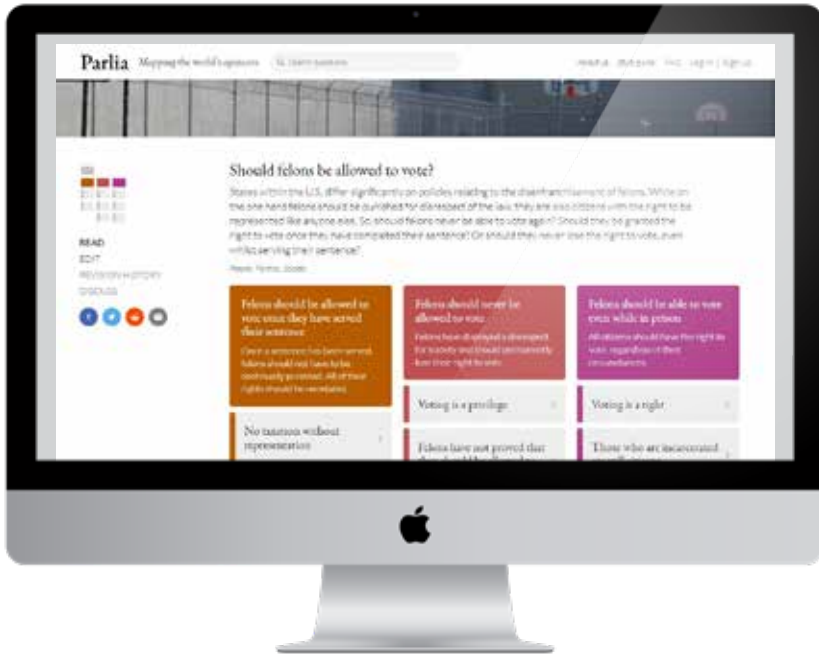
After the Demotix exit he would go on to co-found Porto i/o, a leading tech hub in Portugal, and also serve as the interim MD of Press Association Images. He then became a venture partner for investor North Base Media, a role he still holds today. He is also a board director at political pluralism platform openDemocracy.

Now that Parlia has evolved from its initial idea, it needs a business case – and Munthe believes that it could become the top search result for open-ended questions such as 'is abortion moral?', a query which returns 33 billion results. That top spot is often held by Wikipedia, which may not always be accurate. In other cases, it may be a particularly biased answer.

GOOGLE GRANT

Google provided a prototype investment grant from its Google Digital News Initiative to the start-up 18 months ago. The European organisation was created to "support high-quality journalism through technology and innovation".

Munthe hopes Parlia will have access to Google's expertise as it grows, but he also believes Parlia can help the tech giant. "We're trying to help by being profoundly impartial, by being extremely careful about what we understand as bias, by thinking very deeply about the ethics of our design."



Parlia has also been helped in its development by a cash injection from independent grant-making foundation the Paul Hamlyn Foundation, to help it apply machine learning and natural language processing to its growing pot of data on the opinions of the world.

Munthe wants Parlia to collect opinions in the same way a dictionary collects words – not as an authority on language but simply a document of what is being said. To remain fair, the design shows all top-level opinions side-by-side, with supporting arguments following underneath.

“If we tell the world that we’re trying to rationalise discourse and make everybody cuddlier and better at listening to one another then most people will ignore us,” he says. “I’d love that to happen. I just don’t think there’s a huge user behaviour case for it.

“But if we are answering questions in a way which is satisfying people who ask ‘is Meghan Markle spoiled?’ or ‘is Greta Thunberg being manipulated?’ while sharing the various views, then we could be a really exciting medium.”

As with Wikipedia, Parlia will rely on content created by the public which is then edited by

authorised users. For all the battles being fought beneath the surface of Wikipedia, the user-generated model has become a surprisingly reliable method of content creation.

But Munthe says this front of contributors thanklessly keeping Wikipedia credible could be more diverse. “Most of the contributor base of Wikipedia are male, white and Western,” he says. “I want people on the proper right and on people on the proper left, religious and profoundly irreligious. I need real diversity in our contributor base. Not just politically but also culturally.”

He adds on a particularly controversial subject: “There’s the position that abortion should always be illegal; there’s a position that says that abortion should be allowed to anybody who wants it; and there’s the position that it should only be allowed in extreme circumstances. The same thing is true of euthanasia; if we should abolish the monarchy; and whether Donald Trump is mentally unstable.”

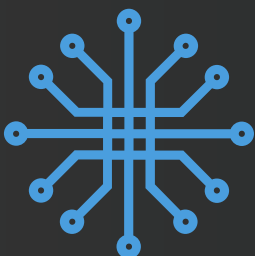
GREATEST RAPPER

There are lighter discussions to be had too. A page currently on Parlia poses the question: ‘Who is the greatest rapper of all time?’, making cases for the likes of Jay-Z, Kendrick Lamar and Eminem. If a user believes the answer is Tupac Shakur, they can simply add that to the discussion. The more opinions its users have on the topic, the more columns are added to the page.

Munthe says it is still early days for the start-up, and it has not and will not have an official ‘launch’.

“You can make little steps without anybody noticing and continue to make those steps until they become bigger steps,” he says. “We will never complete the project, we’ll just keep on iterating and trying to optimise the experience.”

Is Parlia destined to be the next Wikipedia? It either is, or it is not.



Keep up to date on tech

The latest investment, deals and appointments

Yes, Parlia is the next Wikipedia

Every single user of the democratic internet has the chance to share their opinion, and most of them invoke that right at least once or twice. This might take the form of an angry tweet in the heat of the moment, or a more considered op-ed on a well-respected online news site.

Either way, the motivation to make one's thoughts public is rarely straightforward. In fact, questioning that motivation has become part of navigating the modern media landscape. It is right to be sceptical of the 'fake news' zeitgeist with its Russian Twitter bots and "state-sponsored lies".

That's why Parlia feels necessary. The likes of Google and Twitter will continue to struggle with how they distinguish the news and opinion shared on their platforms. News sites continue in the much older struggle to present fact free of opinion.

As crowded as all this makes the internet, there's still a lot of room left for opinion without motivation. That's Parlia's sweet spot.

No, Parlia isn't the next Wikipedia

When people take to Google to have a question answered, they are typically looking for a specific answer – not a rabbit hole to sink time into.

Parlia may work for people seeking arguments on complex open-ended questions such as 'Does God exist?', but the reality is that most searches ask a closed question.

Perhaps a more serious problem is that the various viewpoints are presented separately rather than as part of a single entry. The nature of debate is to offer one viewpoint and then counter it with another, leading to a conclusion in the minds of the participants (and, perhaps, even a slight shift). When you take the nuance out, you end up with two completely separate opposing camps.

And sometimes open-ended questions do have one viewpoint which has more validity than the others. Should we really be giving them equal weight?

FOR AND AGAINST



Check our reference pages every morning at businesscloud.co.uk

100 ²⁰²⁰ SMARTTECH INNOVATORS

The rise of faster networks, artificial intelligence and Internet of Things technology has created the perfect storm for a smart new world.

Incredible amounts of data are now available to companies seeking to save time and money and make smarter business decisions.

More than 1,500 of our website readers voted on a shortlist of around 170 groundbreaking UK-based companies which are harnessing data and sensor technology to power business and smart cities.

Meanwhile a panel of judges also selected the businesses which they feel are displaying the most innovation. The final ranking was decided by a combination of these.

The 100 businesses profiled in the 2020 ranking are impacting sectors as varied as retail, agriculture, manufacturing and transport.

They are also driving productivity and efficiencies in business in general.

Look out for 100 HealthTech Pioneers in Q2, 100 FinTech Disrupters in Q3 and 100 eCommerce Trailblazers in Q4. Nomination forms are available at businesscloud.co.uk.

Many thanks to the judges, listed below.

- Stuart Lynn, TechNorthEast founder and former CTO at Sage
- Jon Corner, MD, The Landing
- Carly Gulliver, managing associate, Addleshaw Goddard LLP
- Teodora Kaneva, programme manager - SmarterUK, techUK
- Dr Joanne Phoenix, interim executive director, Sensor City
- Jonathan Symcox, editor, BusinessCloud

01 **MOBICA**

Based in Wilmslow, global software services company Mobica provides tech solutions in the connected device market. Led by CEO Simon Wilkinson, its customers include leading brands such as chipmaker Arm, Google, Facebook, Intel, T-Mobile, Vodafone and Jaguar Land Rover.

02 **HARK.**

Leeds-based Hark. has built an enterprise-level Industrial Internet of Things platform which captures and monitors data in real-time to help organisations across a variety of industries work more efficiently and smarter. Led by young entrepreneur Jordan Appleson, its clients include major UK supermarkets.

03 **WORDNERDS**

wordnerds uses advanced linguistics and artificial intelligence to help organisations understand customer feedback. The Gateshead firm's Software-as-a-Service platform is used by big brands who have tried 'social listening' and actually want to know what their customers think, not just count the words they use.



04 NOMAD DIGITAL

Newcastle-based Nomad Digital is a leading provider of passenger and fleet connectivity solutions to the transport industry. Trains, metros, trams and buses benefit from its Wi-Fi, trackside networks, reporting tools, security solutions and on-board information systems.

05 LIVINGLENS



Liverpool's LivingLens captures and analyses video content via speech, actions and sentiment, translating the content into business insights for the likes of Procter & Gamble, Deliveroo, O2 and Unilever. Acquired by leading customer experience tech giant Medallia for \$26 million in February, it plans to increase its current presence of four global offices.

06 THE FLOOW

See below

07 CONNEXIN

Hull-based Connexin specialises in building and operating award-winning smart city infrastructure to support the Internet of Things. Among its projects was a brief to deliver the UK's smartest street in partnership with Cisco and Newcastle City Council. It has secured a £10m investment from Silicon Valley to rapidly scale its operations.

08 OCTOPUS ENERGY

Provider of real-time data analytics for energy tariffs. The London energy supplier partnered with Amazon to allow customers to ask Alexa for current energy prices and how green the energy is at that moment. It also loans out FLIR thermal imaging cameras to help customers understand where heat loss is occurring both inside and outside their homes.

09 TRIBEPAD

Smart recruitment and HR software company Tribepad carries out psychometric profiling of candidates and has developed video technology which is capable of recording the responses of interviewees and also reading their emotional reactions. Based in Sheffield, it processes over a million candidates per calendar month for clients including the BBC, Tesco and KFC.

10 ACADEMY OF ROBOTICS

Founded at the University of Aberystwyth, the Academy of Robotics has developed Kar-Go, an autonomous electrical vehicle aimed at the last mile of local delivery on small residential streets. Award-winning designer Paul Burgess left a role at McLaren to become chief designer at the Cardiff company. library of thousands. It has secured more than £35m investment to date.



11 BLUE PRISM

Blue Prism creates and installs robotic process automation technology which is designed to automate simple business processes typically carried out by humans. The Warrington firm claims that its 'AI worker' alternatives can increase productivity by up to 1500%. It boasts clients including Hovis and John Lewis.

12 WHAT3WORDS

London-based What3Words has split the globe into 3x3m squares and allocated each with a three-word 'address' such as books.stress.forces (where the author



The Floow (6)

The Floow is a leading telematics provider whose capabilities comprise of data science excellence, cutting-edge technology and the innovative use of social science to provide unique safety insights. Founded in 2012, The Floow's team currently numbers over 120 people based at our Sheffield HQ, our US office in Detroit and across mainland Europe.

The Floow pioneered the use of smartphones as powerful mobility sensors collecting data from driver journeys - this approach was recognised by industry body Ptolemus who awarded The Floow with 1st place in its UBI Supplier Rankings for European Telematics Service Providers in 2016 and 2018.

The Floow operates worldwide delivering telematics solutions which help insurers price policies more effectively and helps drivers to improve their driver behaviour, making roads safer and smarter for everyone. We're driven by our mission to save lives via innovation and dedicated to making a positive impact on mobility's future.

is sitting right now). The technology, driven by artificial intelligence and accessed through the company's app, is being adopted into Mercedes-Benz and Ford vehicles.

13 WE BUILD BOTS

We Build Bots has developed an AI-powered platform to improve productivity and efficiency within public sector organisations through automation, chatbots and voice assistants. Based in Cardiff, it helped the AA and BSM close their contact centres on Sundays and also works with councils.

14 ELEMENTS TECH

Sheffield firm Elements Tech bills itself as 'the plug-and-play way to connect your factory'. It builds collaborative software to help manufacturers' staff to track, visualise and organise production.

15 SLANTED THEORY

Sheffield-based virtual reality firm Slanted Theory is reimagining how data is explored through immersive tech. Its visualisation and analytics tool ALAIRA works with VR headsets, allowing its users to immerse themselves in a 3D world of complex business data, represented as physical objects. An interview with CEO Laura Thomas is on page 38.

16 AMPLYFI



Business intelligence company Amplyfi harnesses AI to scan and analyse

the 'entire internet' to enable faster and smarter decision-making. Based in Cardiff, it works with academia and governments across the globe.

17 GEEK TALENT

Geek Talent uses natural language processing and machine learning to analyse millions of CVs and job adverts every single day from the internet. The Sunderland business helps companies to understand the labour market and students to find jobs.

18 CONIGITAL GROUP

A deep tech company developing artificial intelligence projects for driverless vehicles alongside partners including UK airports. Birmingham-based Conigital was behind the first UK project to trial autonomous pods on public roads and connect driverless vehicles in a platoon formation.

19 CHAMELEON TECHNOLOGY

Chameleon Technology is a pioneer in smart energy technology, providing consumers with actionable energy insights and intuitive connected home controls through the Internet of Things. Based in Harrogate.

20 ACELERON

Lithium battery developer Aceleron is aiming to accelerate the global shift to cleaner, more renewable energy. The Birmingham firm seeks to empower people to benefit from sustainable battery technology through providing energy storage solutions.

21 SYNAPTEC

Synaptec supplies tech which aims to reduce electricity downtime and allows easier and cheaper monitoring of the electric power grid. Based in Glasgow, it was recently backed with growth investment from Foresight and Williams Advanced Engineering.



22 GAVURIN

Newcastle-based Gavurin develops software to analyse and visualise data and turn insights into impactful reports. Its data scientists, mathematicians and statisticians work with clients to unleash the power in their data by informing strategic management decisions.

23 CIIVSOFT



Based in Daresbury, CiiVSOFT is a developer of recruitment automation technology and tools. Its integrated solutions save companies money, streamline recruiting, reduce bias and help hiring teams deliver better results.

24 ABOVE SURVEYING

Colchester firm Above Surveying delivers cutting-edge inspection and data solutions to the international solar industry. It combines drone technology with AI to monitor solar farms, working to streamline operations and maintenance inspections to increase efficiency.



25 CNC ROBOTICS

CNC Robotics is pioneering the use of robots as an alternative to traditional machines in manufacturing. The Liverpool firm improves productivity within many sectors including architecture, automotive, construction, education, energy, engineering and textiles.



26 THARSUS

Tharsus helps companies to harness robotic and machine technologies. The fast-growing firm designs and builds advanced robotic systems at its production facility in Blyth, Northumberland, and counts online supermarket Ocado among its clients. It has also worked with BAE Systems.

27 CANDDI

Manchester marketing automation firm. Its web-tracking CANDDi software – which stands for Campaign and Digital Intelligence – helps businesses understand which prospects are on their website, what they're interested in and when the right time to engage with them is.

28 CITI LOGIK

Citi Logik provides population movement analytics for smart cities. Based in Leeds, its projects give insight into the way people move on foot, in a vehicle or by train, while it has also monitored in real-time how pollution in cities is linked to road congestion. The company has travelled extensively on UK Trade missions to Scandinavia, Ireland, Kuwait, Singapore and Australia.



29 ECOMETRICA

Edinburgh firm providing mapping insights for business, government and society using data from satellites and drones. From forest protection to disaster response, sustainability reporting software to full global supply chain intelligence, its machine learning technology is complemented by human expertise.

30 WHITE LAB

White Lab's Sensio Air is a smart indoors allergy and air quality tracker and app which logs symptoms and tracks allergens. Based in London, it monitors the air quality in 320 cities across the world and won a CES Innovation Award in 2018.

31 PAVEGEN

Behind pavement tech which converts footsteps into energy, data and rewards. The Cambridge firm's recent installations have included smart city developments, retail destinations, sports stadia and education establishments around the world. Its tech will be used in the creation of \$7.5bn Bleutech Park in Las Vegas, billed as the world's first energy-efficient mini-city.

32 HOWZ

Manchester-based Howz partnered with EDF Energy to develop its home monitoring system for the elderly and those with dementia.



It learns routines within the home via sensor technology and spots changes early, alerting family members if unusual activity is detected.

33 PEAK

Peak is aiming to dominate the global AI market. The Manchester firm's subscription-based service model helps companies of all sizes harness the power of data analytics to drive growth. Its cloud-native platforms plug into a client's business to clean, crunch and analyse data before making recommendations.

34 IOT HORIZON

Blackburn-based IoT Horizon provides Internet of Things services to help businesses realise their Industry 4.0 potential. Its smart solutions – including IT security, payment, location, access, asset management, condition monitoring and compliance – boost efficiency, automation and productivity.

35 ZTP

ZTP's goal is to enhance business performance through supporting energy management and procurement operations. The London company's recently-launched Kiveev platform is the most advanced risk management tool available within the UK, allowing for better trading and utility contract transparency.

36 CREATIVE VIRTUAL

Creator of virtual agent, chatbot and live chat solutions based in London. Leading global organisations rely on Creative Virtual's V-Person technology to improve their support experience, reduce costs, increase sales and build brand loyalty.

37 ARBNCO



Glasgow-based PropTech which aims to improve the efficiency of buildings. Combining wireless sensor technology and smart meter data, arbnco reduces energy consumption whilst creating a healthy working environment with improved productivity and reduced absenteeism.

38 FIVEAI

Cambridge start-up FiveAI is leading the UK's charge to build technology for urban driverless vehicles. Recognising that dense European cities present totally different technical, behavioural, regulatory and infrastructure challenges to their US and Chinese counterparts, it seeks to reduce congestion, emissions, costs, accidents and journey times while boosting the economy.



39 PARTNERIZE

Partnerize is a leader in partnership automation. Its AI-powered SaaS platform combines data-driven intelligence and industry-leading

management tools to unlock ROI for the world's largest retailers, airlines, telecoms and other brands. More than \$6bn in partner sales and \$500m in partner payments are driven and managed through the Newcastle-built platform every year.

40 THE DATA SHED

Leeds-based The Data Shed provides data and analytics services to clients including Hermes, the Tate Gallery, Friends of the Earth and Australian airline Qantas. Helping them to build a single comprehensive data foundation from disparate data sets, its stated mission is to demystify the world of data and level the playing field.

41 INAWISDOM

Inawisdom's AI extracts value from data and delivers business advantage. The Ipswich firm's predictive analytics increase sales and margins, and maximise operational efficiency. They can also detect potential fraud, security concerns and other business risk exposure, as well as proactive maintenance of any physical assets.

42 TRIBOSONICS

Tribosonics is a Sheffield company behind embedded sensor technology for rotating equipment which is capable of extracting targeted, powerful data and enabling digital transformation in the power generation, transportation and manufacturing industries.

43 DUEDIL



London-based DueDil is a predictive due diligence and business information platform. Building what it claims to be

the world's most complete source of information on private companies and the people behind them, the firm's matching technology links together data from authoritative sources, helping customers find, verify and monitor opportunities and risks.

44 BUFFALOGRID

BuffaloGrid aims to power a smartphone revolution that will help drive wealth and wellbeing in the developing world. The London firm has developed a smartphone charging hub which can charge many phones at one time with power supplied by solar panels. Its prototype is being used in mobile operator shops in rural parts of India where electricity is unreliable and intermittent.

45 BUSINESSWISE SOLUTIONS



Businesswise Solutions, based in Nelson, Lancashire, is one of the fastest-growing corporate energy service providers in the UK. Its EMaaS solution uses the latest energy sensor technology, real-time data and the IoT to improve visibility of energy data, draw meaningful insight and eliminate energy waste.

46 GEOSPOCK

Cambridge-based GeoSpock aims to become the processing engine at the heart of next-generation infrastructure, including smart cities and Internet of Everything, as well as powering future mobility applications such as the management of autonomous vehicle fleets. The company's data engine analyses extreme amounts of contextual data in sub-second response times.

47 CAMBRIDGE INTELLIGENCE

Cambridge Intelligence builds data visualisation tools for law enforcement, cybersecurity and fraud detection, making the world a safer place. Its graph visualisation technology is used by Fortune 500 companies and national governments as well as pioneering start-ups.

48 UPSIDE ENERGY

Manchester-based Upside Energy has developed a cloud platform that uses advanced algorithms and AI to match energy demand with the available supply. Its smart energy management system coordinates connected devices such as battery storage systems, electric vehicle charge points, UPS and heating and cooling systems to help the electricity grid deal with fluctuations and times of peak usage.

49 STAMPEDE

Stam pede provides smart guest marketing through its Wi-Fi login portal. Based in Edinburgh, it allows businesses to engage with customers through automated marketing messages and uses real-time analytics so they can learn about them and build loyalty.

50 TENDED



Lincoln-based Tended provides accident detection wearables and intelligent personal safety systems for workers and those engaging in outdoors activities.

It automatically sends for help when someone is in trouble, providing GPS location, live audio and health and activity data.

51 SYRENIS

Headquartered in Daresbury, Syrenis provides personal information management software which helps organisations to achieve data compliance while growing their databases and improving the quality of the insights which can be drawn from them.

52 GSS

GSS is a global leader in the development of high-performance carbon dioxide sensors for demanding markets such as aerospace, healthcare and environmental monitoring. Based in Cumbernauld, Scotland, GSS stands for Gas Sensing Solutions.

Demystifying tech.

BusinessCloud

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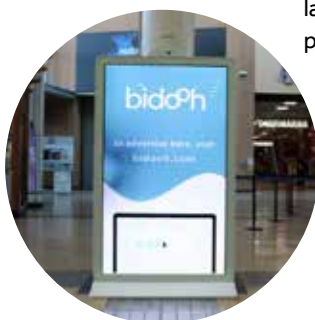
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53 BIDOOH

Manchester-based Bidooh's platform uses facial analysis technology to provide targeted, real-time advertising. Its intelligent digital billboards have been deployed around the world and connect to a decentralised network built on the blockchain which offers publishers immediate access to the group's selection of screens.



Relative Insight originally designed its language analysis technology to help law enforcement agencies identify paedophiles masquerading as children online. It now applies the same methods to enable brands and agencies to communicate more effectively with their audiences.

57 DATABOWL

Sheffield firm which describes itself as an 'all-in-one lead management platform'. Databowl's software helps companies generate new leads, attract new customers and automate their marketing needs.

58 GIOSPRITE

Lichfield-based Giosprite aims to turn 'smart city' concepts into cost-effective, working realities for everyone. It has developed an ecosystem of smart network technologies spanning transport, tourism, environmental and social care to help local authorities and businesses gain valuable insight from IoT data quickly and easily.

59 SELDON

Seldon was founded by Alex Housley with the aim of accelerating the adoption of machine learning by companies of all sizes to solve some of the world's most challenging problems. The London firm's tech was built by CTO and former rocket scientist Clive Cox.

60 WEFARM

London's WeFarm uses AI to connect small-scale farmers to crowdsourced farming information. Labelling itself 'the internet for people with no internet', it uses simple mobile phones to connect some of the 500m small-hold farmers around the world, many of whom are offline and miles from the nearest village.



61 IOTIC LABS

Founded in Cambridge and now operating out of London and the United States, Iotic helps ecosystems within enterprises such as Rolls-Royce Power Systems interact automatically and securely through 'digital twins'.

62 MASABI

London-based SaaS ticketing platform allowing passengers to use a contactless bank card, mobile phone or smartcard to pay for public transport. Masabi is the ticketing partner to Uber and processes more than \$1bn in annual sales through its Justride platform. Recently backed by Shell.



63 REALITYMINE

RealityMine is a behavioural data analysis company based in Manchester. Its market research tech helps marketing professionals achieve unique insights into the mobile and digital lives of consumers through the collection of detailed web, search, streaming media and app usage across mobile devices, tablets and PCs.

64 AUTOMATA

London start-up Automata creates 'desktop' robotic arms to automate product testing, dispensing and sorting at an affordable price of \$5,000. Its 'Eva' robot can be set up and operational in a matter of hours, encouraging industrial businesses to embrace automation like never before.

65 GEO

geo is a Cambridge-based company which makes smart thermostats as well as solar and energy monitoring devices. As the leading supplier to the UK's Smart Metering programme it

54 IMPROBABLE

Founded by Cambridge University computer science graduates Herman Narula and Rob Whitehead, Improbable builds large-scale virtual worlds and simulations. Backed by Japan's SoftBank, the London firm's SpatialOS platform is aimed mainly at games developers but is also used by likes of the MoD.

55 OXBOTICA



One of the world's leading autonomous driving software companies. Ford Mondeos fitted with Oxbotica's tech travelled on public roads around the former Olympic Park in Stratford last year while it hopes to begin the first passenger trials of its ride-sharing service with taxi firm Addison Lee in London in June.

56 RELATIVE INSIGHT

Born out of a 10-year research project with Lancaster University,

has deployed more than five million units to households in this country and is present in 15 countries across the globe.

66 21ST CENTURY TECHNOLOGY

Headquartered in Ashby-de-la-Zouch, Leicestershire, listed firm 21st Century Technology provides solutions to the transport community. Its on-board tech includes CCTV, Wi-Fi and passenger information systems; vehicle and driver performance telematics; remote condition monitoring; and advanced passenger counting technologies. Its external products include bus shelter displays and transport interchange departure boards.

67 ACTISENSE

Marine technology business Actisense makes intelligent sensors for use in boats. Based in Poole, Dorset, it aims to make navigation safer and has established a worldwide reputation within the specialist field of marine electronics.

68 REFRACT



Newcastle tech firm Refract uses AI to help companies improve sales performance. Its SaaS platform provides managers with insight into their team's sales conversations, meetings and emails, helping them to understand what top performers do differently, identify and remedy missed opportunities and build a library of best practice by 'tagging' decisive moments within calls or meetings.

69 BERINGAR

Beringar helps companies to optimise the use of their physical space through smart building sensors. The Edinburgh firm's machine learning tech is used within the NHS and can uncover how people are using a space over time; how air quality, temperature and light are impacting staff; and track how equipment is used.



70 AQOVIA

Aqovia are experts in data, content, software, cloud computing and business transformation. The London firm's smart solutions for the public and private sector are used by the likes of ITV, BBC, Vodafone and Sky.

71 WUBBLEYOU

Based in North Shields, Wubbleyou is a software specialist which works with clients to automate manual paper-based processes, Excel spreadsheets and ancient databases. It works with the likes of BAE Systems and the Department for Education.

72 FUZZY LABS

Manchester-based Fuzzy Labs helps organisations such as Disney Streaming Services, MoneySupermarket, Booking.com and McLaren to adopt AI. It believes AI should be for everybody and publishes its code as well as open source tools.

73 CORROSIONRADAR

CorrosionRADAR is looking to address the industry problem of monitoring corrosion in oil and gas pipelines. The Bedfordshire and Cambridge-based company's monitoring technology is permanently embedded and can accurately pinpoint the location of

corrosion at any point along the full length of a pipeline.

74 DEEPMINER

Headquartered in Aberdeen, DeepMiner was born out of a will to change how we search for information on the internet. Its AI-powered B2B search engine brings sentiment analysis into the equation in the modern era of increasing information overload.

75 GLOBALWEBINDEX

GlobalWebIndex is a market research SaaS company providing audience insight to publishers, media agencies and marketers through data analysis. Based in London, it has offices in New York, Prague and Athens and has conducted more than two million survey interviews since foundation in 2009.

76 CYANCONNODE



CyanConnnode designs and builds networks for IoT communications. Based in Cambridge and listed on the stock exchange since 2005, it is one of the fastest-growing tech companies in the UK and has clients around the world.

77 IMGEOSPATIAL

Slough-based IMGeospatial provides automated business intelligence from large data sets. It deploys AI in unconventional ways, to digest, distil and disseminate data efficiently, regardless of how imperfect or vast that universe of data becomes.

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73 SENSICON

Sensicon's intelligent lighting solutions for smart cities and private spaces saves energy, lowers costs and reduces carbon emissions. Based in Liverpool, it allows cities and councils to manage, maintain and monitor their lighting from an online dashboard.

79 BRONZE LABS

Telford firm developing IoT and cloud computing products and software used throughout the public, private and non-profit sectors. Its projects include loyalty card apps and an augmented reality app for the Midlands Air Ambulance Service.

80 TRANSMISSION DYNAMICS

Transmission Dynamics makes IoT sensors to solve complex industrial challenges. The Cramlington company services blue-chip technology firms across the globe in the renewable energy, mining, marine, defence, automotive and rail sectors.

81 SMART NETWORKED ENVIRONMENTS

Colchester's Smart Networked Environments provides location-based services including indoor and outdoor mapping, positioning and wayfinding. Its digital toolsets are used in the management of major buildings, sites and events – especially those with an indoor element, where GPS doesn't work.

82 NDL SOFTWARE

NDL provides robotic process automation 'AI workers' to the public sector, automating previously manual tasks. The Wetherby business also builds mobile working software toolkits for trusts and councils, allowing workers to access information when and where they need it.

83 SENSEYE

Senseye's technology makes use of AI and machine learning to predict machine failure in the manufacturing industry. The Southampton company takes information from existing Industrial IoT sensors and platforms to automatically diagnose failures and predict the remaining useful life of machinery.

84 PANINTELLIGENCE

Business intelligence provider Panintelligence helps companies use their data to trigger bespoke reports, visualise trends and inform strategic decisions. Originally developed in the credit and banking sectors, the software is now used by more than 200,000 people in the financial services, healthcare and education sectors.



85 PURELIFI

LiFi allows the sending of wireless data embedded in beams of light without the use of Wi-Fi and 5G. Edinburgh-based pureLiFi is working with device manufacturers to have the technology designed into commercial laptops, tablets and mobile devices.

86 STEAMACO



Manchester's SteamaCo is an energy tech firm working on smart meter and IoT technology. It claims its automation software is 100 times more efficient than comparable services, enabling utilities such as electricity to reliably operate in

previously unreachable locations in parts of Asia and Africa.

87 TRACSYS

Highly acquisitive software company Tracsis was founded in 2004 as a spin-out from Leeds University. A smart transport analytics and infrastructure tech supplier, it works with Network Rail, the Department of Transport, TfL, multiple local authorities, major outdoor music and sporting events.

88 ENERGI MINE



Energi Mine is a blockchain-based business that uses deep learning AI models to trade and manage energy. The Ashton-under-Lyne company's platform aims to decentralise the global energy market by incentivising energy conservation.

89 INNOTECH INSIGHTS

Leeds-based Innotech provides public and private sector organisations with data to make major planning decisions by monitoring pedestrian movements in an area, indoors or out, via their mobile phone signals.

90 MSP

MSP specialises in precision software for the advanced manufacturing industry. Based in Northumberland, it revolutionises the way the industry makes and measures parts through machine tool probes and is used by some of the biggest companies in the world in the aerospace, defence and motorsport sectors.

91 ISENSING

iSensing, based in Belfast, creates and deploys sensor networks to capture real-time movement data of people in our increasingly smarter cities. It tracks the flow of people on trains, trams and buses; bicycles; pedestrians; and the uptake of ride-sharing schemes.

92 FORCE24

Force24 is one of the UK's leading built and managed marketing automation platforms with thousands of users. The acquisitive company is based in Leeds and also provides free online one-to-one training to clients.

93 INDUCTOSENSE

Bristol-based Inductosense's battery-free sensors detect cracks, corrosion and defects in structures or products. Their passive and wireless nature mean they can be permanently attached, removing the need to stop the systems when performing regular checks – especially important in the oil, gas and nuclear sectors.

94 GAMA

Gama is based in Manchester and provides data around product innovation. Boasting a worldwide network of over 100 experts in more than 46 countries, its Compass premium subscription service is focused on the fast-moving consumer goods sector.

95 GYANA

Gyana is a tech tool 'empowering anyone to become a data scientist'. The London firm began life at Oxford University and, with more than 80 points of anonymised data collection, claims to be the world's most comprehensive resource for tracking human movement via mobile devices.



96 KIMBLE APPLICATIONS

London-based automation software firm for professional services which is expanding into the enterprise market and has several offices in the United States. Backed by leading Silicon Valley VC Accel-KKR, Kimble Applications optimises resource utilisation, profitability and business scalability.

97 ARGANS

A specialist in satellite-based earth observation, Plymouth-based ARGANS uses remote-sensing applications and services, and geographical information systems to map and monitor the marine, atmospheric and terrestrial environments.

98 SEWTEC

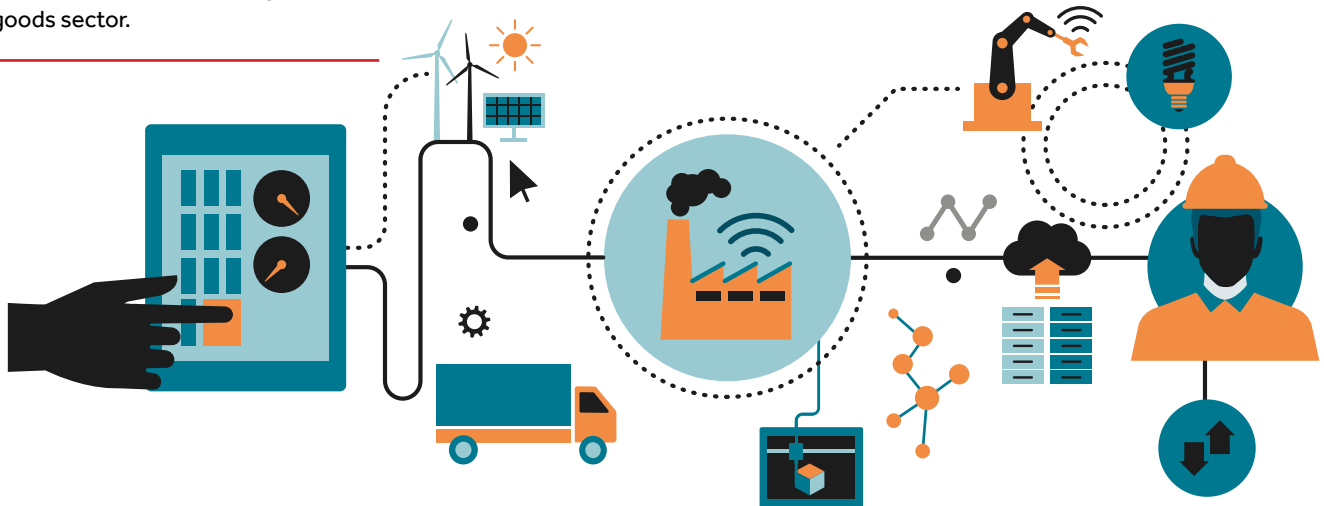
Sewtec began life as the design and development department of the sewing machine manufacturer Singer Corporation. Now a robotics and automation specialist for factories, the Dewsbury-based company designs and manufactures systems for global blue-chip clients in the food, pharmaceutical, personal care and tobacco industries.

99 RESPONSETAP

Brands and agencies across the world use ResponseTap's software to link the online customer journey to a phone call, enabling companies to track and improve marketing ROI. The Salford-based call intelligence platform works with some of the UK's biggest brands including Virgin Money, Aviva and Bupa.

100 VIANET GROUP

Stockton technology firm Vianet provides data analytics to vending machine companies and pubs, linking machinery to the internet to track data and customer spending patterns. The software can be used to improve stock levels and increase sales.



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Mobica CEO

IS MAN ON A MISSION



SERIAL ENTREPRENEUR SIMON WILKINSON REVEALS HIS PLAN TO GROW THE SOFTWARE COMPANY, WINNER OF OUR 100 SMARTTECH INNOVATORS RANKING, BOTH INTERNATIONALLY AND CLOSER TO HOME

Words: Chris Maguire



When Simon Wilkinson received the call to join software services company Mobica he didn't have to consider the offer for long.

Private equity investor Inflexion was keen to strengthen the board after its investment and, not only was it a sector the father-of-three knew well, but Mobica's Wilmslow offices were close to where he lived.

"It felt the right time to step into a business I felt I could add value to," he tells BusinessCloud.

He joined Mobica's board in March 2017, becoming the executive chairman and then CEO in 2018. The company has an ambitious growth strategy and Wilkinson is the man tasked with delivering it.

It's easy to see what Inflexion saw in the serial entrepreneur, who has forged a reputation for creating successful VC-backed businesses. He admits he fell into the telecoms sector in his early career but everything since that time has been more deliberate.

"I used to play football with some guys who started their own business and were doing very well and I thought 'no disrespect to these guys but I could do that'," he recalls. "There was a lot of opportunity. Every day was a learning experience. You learnt on the job."

In 2000 he founded Warrington-based mobile phone messaging software firm Magic4 and sold it to Openwave Systems in 2004 for £46.5m.

He was also the founder and former CEO of Myriad Group, one of the largest global independent providers of mobile handset and software services, with 900 staff, offices in 15 countries and listed on the Zurich stock exchange.

In 2002 his success saw him recognised as the Ernst & Young Emerging Entrepreneur of the Year for the North. "I stepped out of full-time work for a few years after I left Myriad Group," he says. "I was happy enjoying the benefits of a couple of good exits."

Wilkinson wasn't completely quiet, getting involved in Manchester-based

tech firm RealityMine as chairman and investor. Its technology enables leading market research organisations to monitor real consumers across multiple devices.

INVESTOR

Today, he is an investor and NED in early stage technology companies both in the UK and the US but admits growing Mobica is a '24/7' focus. It's fair to say the company he joined three years ago has changed a lot to the one he now finds himself running, most noticeably by the new-look senior leadership team.

Wilkinson has also been credited with playing a key role in strengthening its customer footprint with a series of leading international brands including Google, Facebook, Intel, T-Mobile, Vodafone, Arm and Jaguar Land Rover.

He was joined at Mobica by Stefan Marxreiter as the chief operating officer, who is responsible for further developing the company's software delivery capabilities globally.

One of the biggest differences for Wilkinson at Mobica compared to the rest of his career is he's not working in a product-based business. "We don't have any IP," he says. "We're not a product company but what we deliver

SIMON WILKINSON PROFILE

- 1996** Joins Philips as business development manager
- 2000** Founds Magic4 as CEO
- 2002** Ernst & Young Emerging Entrepreneur of the year for the North
- 2004** Sells Magic4 for £46.5m
- 2007** Founds Myriad Group as CEO
- 2012** Leaves Myriad Group
- 2014** Joins RealityMine as chairman and investor
- 2014/15** Invests in San Francisco start-ups Vinja and Context360
- 2017** Joins Mobica board
- 2018** Becomes executive chairman and CEO

BIG-NAME CLIENTS



is intellectual capital. The focus for us is to grow aggressively in the next two-to-three years in our core sectors and take advantage of the new technologies that are starting to be delivered in the marketplace."

Mobica has a long history of working with the likes of Arm and Intel, relationships that Wilkinson is determined to grow. "We want long-term relationships we can scale and to continue to demonstrate that we deliver value," he says. "We are not trying to be the lowest-cost provider in the market. We are constantly trying to deliver value to our partners and be paid accordingly."

EXPANSION

The CEO wants to expand the number of engineers significantly to 1,500 in the next three years but he's also made a conscious decision to scale Mobica closer to home. "Mobica is a North West business based in Wilmslow but it's been very outward-focused in terms of its customer base in the last 10 years," says Wilkinson. "It's only within the last 12 months that we have started to turn to the opportunity in the North West, which is significant to me."

"That does not mean giving less attention to our international clients but the North is growing substantially. [It] has a deficit of digital talent and we can help fill the gap and allow companies to scale in the regions."

The automobile sector is vital to Mobica, evidenced by the fact the company recently opened its first office in Germany to strengthen its relationships with the country's leading automotive OEMs and suppliers. "We will use that to broaden our customer footprint over time into France and Italy and other significant automobile markets," says the CEO.

Away from work Wilkinson is a keen England rugby fan, Manchester City supporter and father of three grown-up children, but admits Mobica is consuming most of his time. "Scaling a business like this is full time," he says. "It's 24/7. When I'm on top of things I'm more relaxed. My responsibility is to put the team together, set the agenda and support them in exiting it. There's no point having a great executive team and doing it all yourself."

DIGITISATION CAN BE A STRUGGLE



Dan Jelfs, senior VP of global sales at Mobica, explains how it accelerates digital transformation for partners

We're helping companies in different industries solve complicated problems as they try to transform into the company that they need to be in the future.

Some businesses are inherently tech savvy, but there are industrial companies who find digitisation a struggle.

A lot of people are investing to create an environment where they can potentially benefit from data analytics and AI, without specifically knowing the value of those outcomes. They just have faith that they'll be able to figure it out.

The people we engage with at these companies have bright minds and interesting visions but are in real need of an implementation partner like us who can hold their hand on the journey.

A challenge for us is to look at the competencies we need to have as we roll forward: things like data analytics, machine learning, artificial intelligence, computer vision. I think the next wave is how these are applied to different industries to change the way people's health is managed; how a factory operates; and how people move from one place to another.

We technology 'radar map' and develop our engineering talent in these areas because it's where the market demand is and the most appropriate area given our position in certain markets.

It's a constant challenge and something we need to we keep looking at and iterating because the market changes quickly.



AND THE AWARD GOES TO...

Once Upon a Time in Hollywood, Fleabag and Joker were among the big winners at this year's Golden Globes – but London tech business Digiseq was an integral member of the supporting cast

Words: Jenny Brookfield





was the first time Digiseq's solution was put into use and, when winners came backstage to have their trophies engraved, Smith and her team were on hand to write the data stating the recipient, date and any other information remotely into the chip. This year, the business provided the tech for organisers to do this themselves on the night,

and provenance can be verified at any time afterwards with a simple tap of an NFC-enabled device.

ELTON JOHN INTEREST

Once the data was encoded into the chip, a mobile app was used to demonstrate the information locked into that award. "Jeff Bridges was very keen to learn more, and Elton John expressed an interest last year," Smith reveals.

The work came about through Digiseq's inclusion in New York-based accelerator R/GA Ventures, which helps data start-ups link up with clients. It was a high-profile stage for a product that has many potential uses, with counterfeiting a worldwide problem.

Take designer handbags, for example. "Some Gucci handbags have a chip in them but that chip is vulnerable because it's not as secure as the technology we offer," says Smith. "We're advocating to replace that chip with a more secure chip that you can write details on to such as where the bag was made, the colour, who the quality control manager was, which line

it was on, etc – all sorts of information. That way the buyer can be assured that that bag is what it says it is, regardless of whether they bought it online or in a store."

Artwork, luxury goods or wines, too, could be chipped using Digiseq's technology. "You could very easily put a chip on to a bottle of vintage wine or whisky, moulded onto the bottle," Smith says. "If the owner took it off or destroyed it, that would destroy the value – but while it's on that proves that that's the wine in that bottle."

Pharmaceuticals is another interesting area where NFC chips could be useful, with fake medication common, even in pharmacies, Smith says. A chip could show the medication was produced in a particular factory, the name of the person who signed it off and the processes it has gone through to prove without a doubt it is the real deal. "It's about bringing the physical and the digital worlds together and potentially saving lives, in this instance," Smith adds.

The business was co-founded by Smith and Colin Tanner after the pair had worked for the likes of Mastercard, Visa, Amex and Tesco. Smith was instrumental in delivering the Mastercard solution that supports Apple Pay, but both left their respective jobs over a frustration with the use of mobile phones for payments.

"People want to use a device to make payments but want to trust that it won't



Awards season is in full flow in Hollywood and one London tech company has been cast in a starring role.

Digiseq is helping Golden Globes organisers fight fraud by combating the prevalent problem of counterfeit awards.

It's an issue that's seen fake statues claiming to have been won by celebrities sold online, with unsuspecting buyers fleeced out of thousands of dollars.

But now there's another way. Digiseq worked with the Golden Globes in January to help prove the provenance of the prizes handed out on the night.

The company teamed up with the Hollywood Foreign Press Association, using its tech to ensure each trophy was unique and authentic – a solution designed to put an end to the market for fakes.

"We developed the provenance service to identify an item and make sure that it always remains as that item, no matter how many times it changes hands or where it is – we can prove that the item is the same one that was created," chief executive Terrie Smith tells BusinessCloud. "If somebody claimed they had a Golden Globe that belonged to Glenn Close, for example, we can absolutely prove whether it is or not."

The technology works by writing provenance data into a near-field communication chip embedded into the Golden Globe. The 2019 awards ceremony

run out of battery," she says. "I truly believe that the mobile phone isn't the be-all and end-all of life and I didn't believe that Mastercard was willing to move beyond that."

Digiseq began by allowing bank account holders to pay for goods using everyday accessories as if they were bank cards, whether they be bracelets, key fobs, rings or watches, for example – devices that don't require batteries. "We created the ability to deliver your own card into your own IoT device, regardless of what it is as long as it has the right chip in it," Smith says. "We believe that consumers want the choice of where and when and how they pay, and that they want to use something other than a mobile phone."

"These devices don't need a battery to make them effective and that's a real winner because you can never trust that your phone is going to be on."

CONTACTLESS PAYMENTS

In 2019, Cambridge fashion brand DressCode introduced the CashCuff: smart shirts with Digiseq's NFC chips embedded in the cuff which enable wearers to use their wrist to make contactless payments.

There are many other ways the tech could improve experiences for other users. "A person at a festival could have a wristband with a chip embedded in it to enable them to easily make payments while they're there," Smith says.

Banks in the UK, Netherlands, Austria, Germany and Nordics are already using

Digiseq's tech, as well as India and the US. Plans are afoot to introduce it in Australia, with users offered it as a service on their devices.

Smith herself uses it on six or seven different devices and says the ease is much more pleasant than standing in a queue while a customer finds the relevant payment app on their mobile phone. The UK may need to catch up on the rest of the world, however.

"Growth has been a lot more global than we expected, less UK and more European," she says. "The Europeans seem much more prepared to make contactless payments on their wearables."

While payments and provenance make up both arms of the business, she believes provenance may accelerate in growth at a faster rate due to the number of potential applications and the way online counterfeiting is growing.

The business is currently in the process of raising just under £1m investment, which will be spent on sales and marketing. Challenges include getting people to understand the complexities of what the business does from a security perspective, she says.

"People think all we're doing is delivering data over the air but the process actually involves encrypting, making sure we have the right data for the right chips, and there's a huge security process goes on," she says.

"For example, we have to have our data centre locked and secured, and it's an ex-military nuclear bunker, Ash Radar Station in Kent, because it has to have that level of security to have that chain of trust."



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Solve climate emergency the smart way

If the UK is to achieve its goal of net zero emissions by 2050, it needs its cities to smarten up. Bosch director Eman Martin-Vignerte explains how dynamic traffic management could help

Words: Jonathan Symcox



Scenes like the recent flash flooding which hit the UK have pushed climate change to the top of the agenda.

Scientists acknowledge that higher temperatures result in more rain, particularly during weather events such as the Ciara and Dennis storms which swept the country on consecutive weekends in February.

The increasingly extreme weather could be tempered by government's target of achieving net zero emissions by 2050. But, other than banning petrol and diesel vehicles, what else can be done to hit that seemingly unlikely benchmark?

Several UK cities are planning to introduce low emission and clean air zones in 2020 and beyond, with the aim of improving air quality by

discouraging or restricting polluting vehicles. However making the flow of traffic more efficient could also play a massive role.

"The climate emergency and air quality problems in cities are a global problem," Eman Martin-Vignerte, a director at Bosch, tells BusinessCloud. "If we allow cities to be smarter through dynamic traffic management, that could help.

"First of all, you need to understand the air quality in your city by placing smart sensors everywhere to collect information. The second step is to understand the traffic flow: why you have traffic in the first place; where it is coming from; and when it is happening. You then start to apply 'traffic manoeuvring' in the city to release traffic in the stressed area to other roads, which are less jammed."

Connectivity between all these information points is crucial for this to work. "You need to allow communication between the air quality sensors and the authorities which have the information – such as Transport for London – about the cars coming in and out from your city, and then connect all of this to a clever platform which will give you the best route to take to avoid the air quality hotspots. That is a solution Bosch offers. We are looking to collaborate with all of these authorities."

Martin-Vignerte, originally from Qatar, began her 20-year career at the German multinational as a programmer in its automotive division looking at the "engine brain" which controls how a car works. However she moved into sales in order to follow a leadership path which took

her to the UK via South Korea. She worked in the firm's energy and healthcare departments before settling into a role looking after political relationships.

"The government's devolution agenda to give more power to the regions was a good move – but the councils had to simultaneously reduce costs. So what happened was they didn't have enough resources to look into these solutions,"

she explains. "In my experience, the procurement regime which we have currently in the public sector is [also] not fit for purpose. It needs to be easier and faster – not just to help the corporate companies [introduce new tech] but to help SMEs because many of these companies cannot wait three, four years to actually get a contract."



Martin-Vignerte offers the example of connecting a smart lamp-post, which might mean signing a 10-year contract with a technology provider. "Do the local authorities really need to own the assets?" she asks. "Maybe they can lease them, which would give them more flexibility with suppliers and ensure the lamp-post is not fitted with an old technology which is no longer fit for purpose."

Despite government plans to bring forward the ban on the sale of new petrol and diesel vehicles by five years to 2035, recent Bosch research found that 40 per cent of drivers had not considered buying an electric vehicle so far because of a lack of charging infrastructure.

"Most of the charging points in London, for example, are not effective," says Martin-Vignerte. "They have to be smart and allow people to communicate with them [so they can then make use of them]. If you want to support EV uptake, you need to support the easy usage of charging points otherwise people will not switch."

More careful planning and communication of infrastructure changes is also essential. "When we talk about smart cities, we confuse people. It's definitely a journey. You need to take people with you," she says.

"A few years ago Uber didn't exist in London. When it was introduced people loved it, and

the intention to create a modal shift [so people didn't drive or own cars] was good – but the integrated transport mapping didn't work out because you added a layer to the transport system instead of integrating it.

"Incremental change is definitely good; but also learning about that change and adapting better to it."

Martin-Vignerte is especially excited about the potential of 5G to allow faster communication between 'things and things' rather than between 'things and people' and says Singapore is a global connected city leader.

"The government there has a leaner structure which allows a more agile approach in empowering smart cities," she says. "People also have a different attitude towards connectivity there and share a lot of information online. What is inhibiting connectivity in the UK in a big way is that people think 'Big Brother' is watching them – and there's no incentive from the industry for people to share the data they accumulate."

"The UK is actually a pioneer in technology adoption – it has taken to digital payments and FinTech far quicker than Germany, for example – so it should happen."

EV DOES IT

Bosch surveyed 2,000 UK driving license holders about electric vehicles – these were the findings

- **40%** - put off buying an EV because of lack of infrastructure
- **70%** - concerned about charging and battery life
- **71%** - state that EVs are too expensive for their household
- **70%** - didn't know EVs are not necessarily carbon neutral
- **66%** - intend to switch to full electric or hybrid vehicles by 2030



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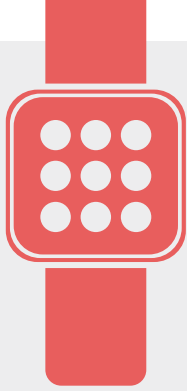
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SMARTTECH

FROM BUZZWORD TO FUTURISTIC PHILOSOPHY

'SMARTTECH' COULD REFER TO A SINGLE CONNECTED FRIDGE OR CITY-WIDE SERVICE IMPROVEMENTS. SO HOW DO YOU DEFINE IT? THE EXPERTS EXPLAIN HOW - WHEN IMPLEMENTED WITH 5G, THE INTERNET OF THINGS AND BIG DATA - IT CAN IMPROVE LIVES AND SPEED UP BUSINESSES

Words: Alistair Hardaker

BOOSTING PRODUCTIVITY

'Smart tech always starts with data'

Is it time to give up on 'gut feelings' about data and hand the job of analysis back to the machines?



James Backhouse, CEO of AI-powered forecasting service Skarp, certainly thinks so. His background in marketing for brands such as Evans Cycles and Carluccio's showed him that firms have access to all the data they could need, but misattribute the causes.

"When things are going well, everyone's trying to claim credit," he told the audience at BusinessCloud's BC Insights: SmartTech conference. "When things are

going badly, what can you blame? For the last three years, the answer has been Brexit. I think you've probably got another 12 months of that, and then we might have to come up with a new excuse!"

Machine learning, meanwhile, is capable of finding objective insights and correlations which humans cannot. Skarp uses this technology to compare a company's bottom line against factors such as the weather, pricing models and competitors' movements. "No matter how smart they might be, it's effectively impossible for a person to pull that data together with an Excel spreadsheet," says Backhouse.

It outperforms human-based forecasting of restaurant sales, call centre targets and even crime figures. "We are in the business of prediction, not magic," he says. "We might be 15 per cent off, but if a client is currently 30 per cent off, we've made a massive difference to their business."

Donna Edwards, programme director for Made Smarter, said the ethos of SmartTech is simply to use technology to help people do their job better. Even, in her case, if businesses might at



first be hesitant. The North West pilot, now a year old, is designed to help manufacturing firms embrace digital tech.

Edwards says a lot of small manufacturers don't engage with new tech because they feel they don't understand it. "The manufacturers that we start working with have still got clipboards with paper. Their documents are walked from one operator to another operator. They are in buildings where you can't see one end of the process to the other," she reveals.

"By putting in planning systems and sensors, you start to capture data and understand where you are in your own business. It all comes back to having the data for you to manage that organisation effectively."

Edwards says there is "a lot of room for improvement" in the UK manufacturing sector compared to the likes of China, where tech is connecting suppliers and manufacturers to automate end-to-end processes. The pilot has brought about a 40 per cent improvement in productivity in the case of its early adopters, who are plugging new technology into their factories and plants to reduce waste in materials and gain back time.



Lucy Lynch says it is vital to connect industry with universities to mould the tech courses taught to students.

Lynch is head of graduate partnerships at Eden Smith, a specialist data staffing and consulting company based in London, and works with data science and Internet of Things cohorts across the country. Eden Smith's Nurture Programme, which is led by Lynch, is working with 16 universities to identify talented data scientists.

"I'm encouraging data scientists to tell a story. I'm their least technical stakeholder, so I ask them help me understand what the data is telling them because that's going to be their job in the future," she explains. "When they're trying to get the next level of funding, they need to be able to make that math translate for someone like me, who is not going to understand it."

WORKSPACE EFFICIENCY

'Interconnected in ways we never saw before'

When sensors are applied to every machine inside a factory, SmartTech begins to take on a different meaning. Applied at the scale of a whole building, businesses can look at the likes of energy efficiency at a macro scale.

Niko Kavakiotis, head of building performance and sustainability at Siemens Smart Infrastructure, describes the firm as an 'energy solutions integrator' which helps business to manage their energy usage. He says SmartTech is vital in



the process of improving the energy efficiency of buildings because people wrongly assume that buildings already self-manage their energy, which comes at a cost to the environment.

"We did a study as part of the solutions we deliver and found that a nurse would spend approximately 72 minutes on his or her shift trying to find assets," he explains. Approximately 20 per cent of nurse time was devoted to patients, and at a time when the country needs more nurses, increased exposure to patients could be allowed by SmartTech.

"We could reduce the time a nurse spends trying to find different assets in the hospital through new smart technology, which is paid for by energy savings. So all these things are interconnected in ways we never saw before," says Kavakiotis.



Joe Warren, director of bespoke energy management and trading systems firm ZTP, is an expert in the business of energy, with experience in procurement, contract management, business development, conservation and software design. Using machine learning, ZTP predicts where electric and gas prices for the UK and Europe are going to go over short periods of 24 hours or over a year.

"What we're trying to do is give energy managers the ability to manage the energy and make efficiencies and reductions, rather than what we often see, which is that they spend their entire working life collating the data, cleansing it, and starting again after a month," Warren says.

Jordan Appleson founded Leeds-based Hark. to provide sensors and monitoring to the life sciences and drug development sector, where stringent standards require temperature to be constantly monitored. Hark. has since expanded to provide sensors in radiation and uranium mines, and also provides real-time energy monitoring.

"We made the platform connect to any building management system, any sub meter, any energy meter, any industrial process, manufacturing line," he says. "We can stream in real-time all the data out of the assets. For a supermarket, we might be monitoring the energy used by the bakery, refrigeration systems, lighting.

"We use that data to then predict what the assets should do. If there are any anomalies, we alert people: for example 'this asset has 20 per cent more energy today than we think it should have'."

The firm now controls the assets in stores, sending back down control signals. The technology has the power to save supermarkets from the threat of huge bills during the 'triad period', which runs from November to March and can increase costs by 1,000 per cent. "Essentially, it's kind of a tax on usage," says Appleson. "There's a



possibility that the price of energy for that day, for that site, on average will increase by a thousand-fold.

"A supermarket might spend £100m a year on energy. Those triad taxes can cost anywhere between £7-12m a year."

From 2019-20 Appleson says he saved one of his clients' buildings a bill of £1m through anomaly detection and power usage monitoring.

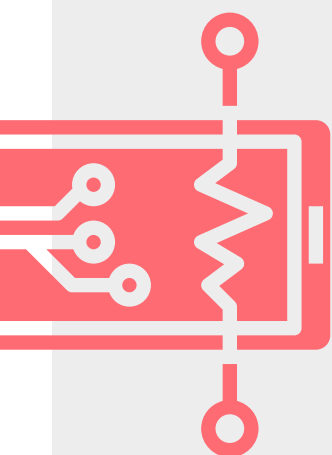
SMART CITIES

'Small incremental marginal gains make a smarter city'

As buildings become smarter, so do our cities. The utopian ideal of the green, connected smart city is one Jon Corner, chief digital officer of the City of Salford, is trying to realise.

As part of an organisation called Digital Salford, he works with hospitals, universities and councils to collaborate on smart city goals. "I get all of these people around the table and ask them how we can make Salford the most connected digital city in the UK," he says.

Salford's MediaCityUK, home of the BBC and ITV, is a key exemplar of a smart city, says Corner. The area was 'future-proofed' during its build with 20,000 miles of dark fibre installed and distributed Wi-Fi in every room of every building. It also has a commercial 5G network. "We have every piece of the connectivity jigsaw puzzle, as well as an IoT network."



Corner is treating MediaCity as a 40-acre mini smart city and this year aims to “bleed” its successes out into the wider Salford area.

He believes a successful smart city begins with two pillars. “On the one hand, there’s asset management and the efficient management of your physical assets. When you look at cities around the world, a lot of smart city dialogue is around command and control; controlling traffic, energy, environments.

“The other way of thinking about smart cities is to look at data and people. How do we get smarter with our data? How do we start to aggregate data in ways that we can look after people?”

A truly ‘smart’ city is one which simply delivers a better service to its inhabitants through tech, argues Tzvete Doncheva, in charge of ecosystem and PR at PropTech VC Round Hill Ventures.

A practical example of this might be capturing data from cycle lanes to analyse how roads are being used and then to look at ways of encouraging people into alternative modes of transport.

Dawn Embry of Mobica, which delivers software engineering services to technology customers, believes we should be using the term ‘smarter cities’ rather than ‘smart’.

“I think as human beings we tend to

get attracted to the extremes. In the media, it’s all about the green-field smart cities, going into areas where there’s limited infrastructure and doing end-to-end development,” the firm’s director of strategy and performance says. “But actually, we can do a lot with ‘smarter’ cities.”

Embry says that citizen-centric technology which allows smart parking or smart lighting doesn’t require huge infrastructure change or building locations from scratch. “I think we can have a really big impact now, and we shouldn’t get caught up in the end-to-end change that requires a big ecosystem, but prevents the progress that we can be making,” she says.

“Most buildings waste 30 per cent of their energy through inefficiencies in lighting, heating and cooling. If we can just make small incremental marginal gains in that it makes it a smarter city.”

New 5G technology, often synonymous with enabling smart devices and cities, isn’t always necessary either, she says. “It’s about going back to the humans, and what we can do, and therefore what we need in terms of information and innovation. You need to go back to the use-case.”



Dr Joanne Phoenix prefers the term ‘sustainable cities’ to ‘smart cities’.

Dr Phoenix, who is interim executive director at Liverpool’s cutting-edge sensor and IoT hub Sensor City, stresses the importance of ensuring all available sensors are actually being used in modern buildings – and also of adding sensor tech into older properties.





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An illustration on the left side of the page depicts a city skyline with several tall buildings. A sign on one of the buildings reads "SALE NOW" with a red apple icon. Below the buildings, a road with a yellow car and a train is visible. A large, white, fluffy cloud is positioned in the foreground, partially obscuring the road and buildings. A thin white line with a loop extends from the cloud towards the top right, ending near a small orange airplane.


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DATA'S NEW DIMEN- SION



IMAGINE STEPPING INSIDE A VR SIMULATION WHERE YOU COULD LITERALLY PULL A DATA SET APART AND UNDERSTAND EXACTLY WHAT IT MEANS. WELCOME TO THE FUTURE - COURTESY OF SHEFFIELD FIRM SLANTED THEORY

Words: Alistair Hardaker



life-altering secret has been kept from the rest of the world by data scientists, analytics managers and financial departments.

Hidden behind a smokescreen of spreadsheets, bar graphs and pie charts, the sector has persuaded us all that data is boring. It is best avoided.

However behind that smokescreen the experts spend their time digging into large data sets, spotting trends and catching anomalies in business data. All this, it turns out, is actually quite fun and rewarding.

The co-founders of Sheffield-based virtual reality firm Slanted Theory could be the ones to finally expose the myth and reimagine the way data is explored through immersive tech.

"People generally don't see the potential until they put the headsets on – and then they understand," is how Mark Burkitt, one of the two co-founders, explains the firm's first product to BusinessCloud.

Slanted Theory's visualisation and analytics tool ALAIRA works with VR headsets, allowing its users to immerse themselves in a 3D world of complex business data, represented as physical objects.

The difference between this and a screen is a matter of dimensions,

explains Burkitt's fellow co-founder Laura Smith, who serves as CEO. "With 2D visualisations, you're shown four dimensions of data. With 3D technology, you've got so many extra dimensions," she says.

The pair hope that a future with ALAIRA to the fore means large sets of business data will rarely make their way on to a tiny office computer screen, where they say it doesn't really belong. Instead, they hope to see people literally stepping into and walking around a world of representative sculptures, which can represent any business data imaginable.

"We want data to be engaging. We want to make it sexy. If you can make it more in line with the way that people think, then you're going to boost everybody's productivity," says Burkitt.

Smith adds: "You never actually lose sight of how the data is connected every time you drill down. It's great not just for analysing, but also for the storytelling aspect."



DEMOCRATISING DATA

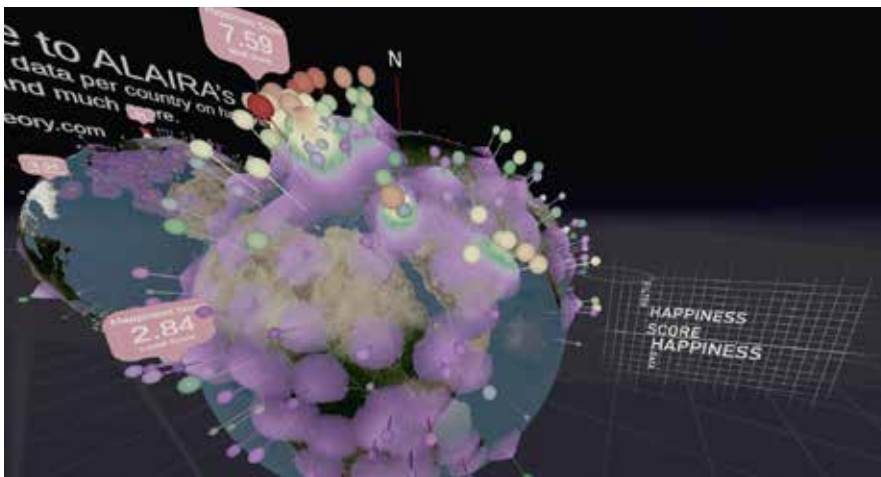
The approach does away with numbers in the conventional sense. Instead the firm's experiences are built around our understanding of size, shape and distance – and our need to pick things up when we inspect them.

The hope is that it will democratise data and allow everyone to become an analytical expert. "You can find an insight by drilling down, and then go back to your manager and say 'this is what I found. These are the steps that I took to find that'. You can walk them through that visual language, which crosses a lot of different barriers," says Smith.

The futuristic vision of office workers in VR headsets pinching at the air may seem novel at first, but its founders are certain the technology will outlast VR's image as a fun novelty. "Businesses are still a little bit unsure of what the technology can offer," says Smith, who believes this will change as it is trialled by more people.

"We have a natural ability to look for trends and patterns in things. Our brains are still generally better than most computers, so if you display data in a visual format, you are likely to make discoveries and see trends a lot quicker."

She says the firm, founded in 2017, has both educated the market and tried to sell to it at the same time. Some sectors, such as healthcare, are already seeing a return on investment, while the team is working



closely with researchers at Leeds and Sheffield Universities to explore data in areas such as rainfall and air pollution.

WORKING WITH TECH GIANTS

Last year ALAIRA was selected by Facebook for its Oculus Independent Software Vendors (ISV) programme, which looks to accelerate customer adoption of VR solutions built for Oculus enterprise products.



The firm also has Cisco on board. Slanted Theory worked with the tech giant to develop HR analytics which can be explored in VR. The Organisational Network in Virtual Reality (ONVR) product they created allows Cisco's Chuck Shipman to explore the collaborative potential of Cisco's employees. Shipman is quoted as saying his first experience of it almost brought tears to his eyes.

The system visualises each employee and a connected 'influence flow', including individual and team strengths, and their relationship to specific projects. "HR analytics was not an approach we had even thought about.

It was a really interesting piece of work that we did with them," says Smith.

The firm is now looking for more companies to come forward with their specific data problems, so that the firm can help find a solution in three dimensions.

"With 2D software and data you perhaps have a notebook, or copy and paste information somewhere," says Smith. "With our system, you can have it all open – all the branches of interest – and then move them next to each other to compare them and annotate them."

But not content with breaking down data's association with Excel sheets, Smith says ALAIRA is also a natural alternative to video calls and presentations. "I essentially see this replacing PowerPoint in a way, not only by allowing people to explore the role

of data but as an analytics tool and a presentation tool all in one.

"We could start to get rid of reports. Instead just put a headset on, welcome people into the environment and you can show them what you've done and how you found it."

SHARED EXPERIENCE

Any two people with a VR headset can step inside the same data experience, regardless of where they are in the world.

"Everybody has issues, especially with Skype and Google Hangouts, as they try to share screens and pass controls to each other," continues Smith. "When you're in the VR world, it's just like being in a natural office. It doesn't matter where you are in the world, you can come together and look at different aspects of the same data.

"This can be done anywhere. It facilitates people being able to work remotely at home. You can be travelling to conferences, you can be sitting on the train or you can be at the airport, projecting our visualisations and still collaborating."

Smith says this scenario could become reality within three years, but that in 2020, the dream of a VR office is just beginning. As the technology matures, the opportunities only improve. "There is a lot in terms of hardware and in terms of service software that we will be developing," she says.

One of the new features on the firm's roadmap is the introduction of mixed reality, meaning these objects, maps and networks can be "embedded into your real office as opposed to a virtual service".

The technology will allow the same 3D representations of data, presented as a layer on top of the real world, be that a home office or boardroom table. Smith predicts the mixed reality technology is seven to eight years away.

"The ultimate goal is to make it so that it's commonplace for everybody," she says. "Whenever you see data, anywhere from on a piece of paper to an infographic, all the way through to 3D visualisation – if you can represent it in a way that is going to create impact, then you're going to walk away and remember it."

SLANTED THEORY PROFILE

Founded: 2017

Headquarters: Sheffield

Platform name: ALAIRA

Concept partners: Cisco, Facebook/ Oculus, Genesys, Institute for the Future

INSIDE ALAIRA

When you first enter the ALAIRA platform through a pair of VR goggles, the sheer scale of the virtual world is the first thing you'll notice.

The dimly lit virtual space is vast and empty, with a seemingly endless floor in all directions. This empty space is necessary though. As you meet your team-mate, represented by a genderless avatar, the two – or more – of you can begin literally grabbing and pulling at the data inside.

The process doesn't sound particularly productive, but think back to the last time you prodded

at a monitor. That instinct to physically get hold of the data no longer needs to be repressed.

Once inside and familiar with the environment, the only limit is your comfort with the space. You can grab two data points and compare them by eye to see which is bigger. You can rip apart blocks of data to see what's inside.

When you're done exploring a certain set of data, you can simply step back (in real space, that is) and leave the nebula of graphs you have expanded to one side.

This might be 'digging' into data, but it feels a lot more like play.



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Sustainable start-up behind your beer

CAMBRIDGE COMPANY KISANHUB IS CONNECTING COMPANIES SUCH AS GLOBAL BREWERS WITH SUSTAINABLE CROPS. CO-FOUNDER GILES BARKER EXPLAINS HOW IT IS HELPING FARMERS TO OPTIMISE THEIR HARVESTS

Words: Jonathan Symcox

The next time you raise a glass of beer to your lips, take a second to think about the journey it has taken to get there.

You may be thinking of malting, mashing, fermentation or conditioning. Yet brewers are mapping out the entire process months before the core ingredients such as grain even reach their factories.

"When you drink your beer in a pub in London or New York or Mumbai, some grower somewhere has planted that seed and that's come through a supply chain to get to your lips," KisanHub co-founder Giles Barker explains to BusinessCloud.

KisanHub provides its agricultural intelligence software to global beer-makers, enabling their breweries to access local ingredients wherever they are in the world.

"One of the things brewers are focused on is how they can grow more sustainable crops," says Barker. "They use our platform to promote sustainable growing practices and use of natural resources, be it land or water.

"We need to bring new ideas to the table because if we don't, someone else will come along and start to copy what we do and take our market share"

"Say they have around 1,000 growers in a country supplying barley. They use the Kisan platform to connect directly with those growers, who all have access to the application, to supply information about how to grow that crop more sustainably.

"But throughout the season the growers will also enter data, which will then be fed back about how that crop is progressing. So they receive earlier insights about the quality and quantity of the crop, which means they can forward plan. They also get information about the sustainability

of how that crop has been grown. How much water did it need? How much fertiliser is being used? When was that crop harvested? Where did it come from? When was it delivered to the factory?

"Having all that in one place means you're able to aggregate that data quickly, create insight for them as a business and also provide that back to the grower to help them grow a more sustainable, high-quality crop going forward."

COO Barker set up KisanHub with CEO Dr Sachin Shende (above) after the pair met at Cambridge Judge Business School. Before his business management studies, Barker used to help out with lambing and fruit-picking on the family farm barely 15 miles from KisanHub's Cambridge base.

Kisan, the Hindi word for farmer, is a nod to Dr Shende's nationality. He hails from farming stock in India.

"Sachin worked in the financial industry where fund managers

have all the digital and software tools in front of them to take informed decisions using data," says Barker. "We saw the opportunity for farmers to analyse their data and optimise like other industries have. Optimising can cut costs and increase profit margin, but also grow more produce using less resource, which is vital for the growing population. You can't measure unless you're collecting data.

"We were a bit naive about the possibilities in the early stages of the



business: we wanted to count every single farmer in the world as a client. Over time, we started focusing on selling our software to the companies the farmers supplied to rather than the farmers themselves.

"That gave us an economy of scale: rather than selling to 1,000 individual farmers, you're then selling into one big corporate, which makes it easier."

The enterprise SaaS platform can help farmers to manage crops through pest and disease outbreaks as well as increasingly unpredictable weather events. "We work with a lot of potato producers in the UK and they've had it really tough for the last two years: the year before last there was a cold snap and then not a lot of rain; then this year we had a real deluge of rain towards the end of the season," says Barker. "Parts of Lincolnshire, a real potato-producing area, were underwater.

"The consumer still goes to buy their potatoes like nothing has changed but the farmers had to go through massive different stresses to make sure they are there and that the quality is right. Sometimes you may get a bit of a dodgy potato, a bit brown or a bit green, but that's not because the farmer hasn't tried. One of the things we can do is tell that story to help consumers understand."

The majority of KisanHub's business is with fresh produce companies in the



UK. However it also has other clients in India as well as South and North America. "In the next 12 months we'll definitely have a UK focus," says Barker. "We've got some good traction but we need to double down on the UK market because there is a big opportunity there."

"That will then give us the information and confidence we need to be able to enter a new market properly. What's also quite nice about what we do is there's quite a bit of network effect: quite a lot of the time UK clients will have a parent company with operations globally."

KisanHub was chosen as the most innovative technology company by independent judges and our readers in the East of England Tech 50 ranking in late 2019. Expressing surprise and humility at receiving the accolade, Barker said the key was keeping a start-up mentality.

"It's always nice to be recognised for the hard work that our team is doing [but] I don't think Sachin and I feel like we've been successful. We aren't satisfied with what we're doing yet. We're always pushing for more and hustling as much as we can."

"We need to bring new ideas to the table because if we don't, someone else will come along – perhaps bigger or better-funded or more established – and start to copy what we do and take our market share. We need to make sure we stay at the cutting edge of bringing new technologies to our market."

"After speaking to our clients, early next year we're introducing digital contract management in place of paper forms for when deliveries are made."

Barker (above) is full of praise for the Cambridge deep tech ecosystem, which was heavily represented in our Tech 50 ranking. However it will present a challenge when he is looking to supplement and retain the firm's staff. "One of the things we emphasise in the company is that we want people who are technically superior, but we also want a balance of people with an agriculture background to make sure we stay true to our roots," he says. "We are able to attract and retain some really good talent because we're quite mission-focused and an exciting opportunity."

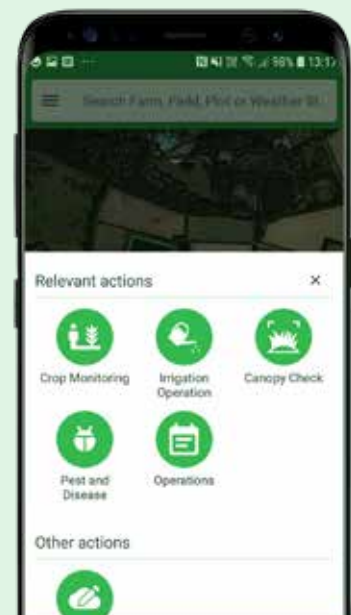
"A lot of my friends who were brought up in cities don't have much of a connection with how their food is produced. I don't think the consumer wants to be informed about everything, but we can provide the information about where food is produced to people who are interested."

"I think the ability to provide that information – and help develop a more sustainable food supply chain – is important and very impactful."

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2013

Funding
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Staff
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Enterprise clients
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IS ONECOIN THE WORLD'S BIGGEST CRYPTO HOAX?

IT HAS ALL THE INGREDIENTS OF A HOLLYWOOD MOVIE: A GLAMOUROUS LEADING LADY, LUXURY YACHTS, A SLICK STORYLINE AND THE PROMISE TO GET RICH QUICK. THE PROBLEM IS INVESTORS HAVE LOST BETWEEN €4-15 BILLION ON A CRYPTOCURRENCY THAT WAS NEVER ACTUALLY A CRYPTOCURRENCY

Words: Chris Maguire



lady in a flowing silk ballgown takes to the stage at London's Wembley Arena to the sound of Alicia Keys' hit *Girl On Fire*. Flames shoot high into the air and hundreds of screaming fans hold aloft their smartphones as they welcome their hero.

The date is June 11th, 2016 and with her trademark bright red lipstick and expensive diamond drop earrings, Dr Ruja Ignatova looks every inch the star. However there's a difference: this isn't a pop concert, but a financial sales presentation.

Dr Ruja is the 'founder and visionary' of a pseudo 'cryptocurrency' called OneCoin that, at the time, was taking the world by storm. Less than 18 months later the self-styled 'Cryptocurrency Queen' failed to show for a OneCoin event in Portugal and things began to unravel. She hasn't been seen since – just like much of the billions that investors all over the world have parted with.

OneCoin was never a legitimate cryptocurrency as it was not underpinned by a functioning blockchain platform that would allow people to buy and sell coins on an exchange. Investors, who believed Dr Ruja's claims that OneCoin would eventually be traded for real money and accepted in shops and restaurants, saw the notional value of their investment soar on their computer screen – but it didn't reflect any true value because it was just a price made up in Bulgaria, where OneCoin was headquartered.

Today Dr Ruja is still missing and wanted by the FBI on allegations of wire fraud, securities fraud and money laundering. The FBI described OneCoin as a 'pyramid

scheme based on smoke and mirrors more than zeroes and ones'.

According to the BBC, her brother Konstantin has admitted his role in the Ponzi scheme-type fraud and could be jailed for up to 90 years while US lawyer Mark Scott has been found guilty for his part in the fraud and is awaiting sentence.

THE MISSING CRYPTOQUEEN

The rise and fall of OneCoin is the subject of a brilliant BBC podcast called 'The Missing Cryptoqueen', with Jamie Bartlett and producer Georgia Catt, and begs two questions: one, how could it happen; and two, could it happen again?

Gavin Brown, a senior lecturer at Manchester Metropolitan University and acknowledged as an expert on all things crypto, answers the second question first. "Yes, it could happen again – and it's probably happening as we speak," he tells BusinessCloud. "Because greed exceeds their level of scrutiny people don't want to miss out. The problem with the cryptocurrency space is it's not regulated so these things can happen."

Before we try and answer the first question we must first understand the process of how cryptocurrencies are normally launched. According to Brown, the first thing you'd do is create a white paper – similar to a business plan –

explaining how the cryptocurrency would work. You'd then launch a second white paper in code, outlining how many coins there would be and how they would be created. For example, Bitcoin stated at the outset there would never be more than 21 million in existence. There are currently 18m in circulation. This helps protect the value.

Once the white papers are produced, you'd then create a team of developers, coders, PRs etc and engage with exchanges that allow customers to trade cryptocurrencies. Once you meet certain criteria, like liquidity, you can launch your cryptocurrency and increase the supply of coins as demand grows.

Just like Bitcoin, the early adopters of a successful cryptocurrency make the most money, which is why investors were so willing to pour investment into OneCoin without a second thought.

"OneCoin was well-organised," explains Brown. "The platform

was well put together. They had an enigmatic speaker. They launched at a time just before the ICO (initial coin offering) craze.

"However for a cryptocurrency to work you have to be underpinned by blockchain. For instance, anyone can see Bitcoin transactions as they happen. You didn't have that with OneCoin. You could go to the website, see how much they said your investment was worth but they were managing it all.

"I wouldn't have invested in OneCoin because I could not see the user case. What does it add to the economy?"

INVESTIGATION

Twelve months ago journalist Bartlett received a phone call from a producer asking if he'd ever heard of OneCoin. "I thought it was bonkers," Bartlett tells BusinessCloud. "Although I'd studied a lot of cryptocurrencies I hadn't heard of it. OneCoin was not

targeting typical crypto investors, it was targeting ordinary people who didn't understand tech."

It was a phone call that sparked a nine-month investigation that took him all over the world, from OneCoin's base in Bulgaria to Germany where Dr Ruja had lived, Holland, Romania, Scotland and even Uganda, where poor farming families had invested in it.

The first OneCoin transactions can be traced back to the end of 2014 although things started in earnest in 2015 and took off from there. The central figure throughout is undoubtedly Dr Ruja. Bartlett never met Dr Ruja, who would now be 39 if she's still alive, but he's seen plenty of the cult-like status that surrounded her.

"She's charismatic, as anyone who leads a large organisation tends to be," he says. "She's very intelligent. Her secondary teacher said she could recite German poetry within a few months of learning the language."



Bartlett said she had to be incredibly 'gutsy' to stand on a stage and speak with real conviction about something that was effectively a scam (something OneCoin has consistently denied). Investors might not have fully understood the technology, but they believed her when she said the future belonged to cryptocurrencies.

What's clear is OneCoin took advantage of the intransigence authorities all over the world seemed to display to the threat, partly because cryptocurrencies are relatively new. "When it comes to cryptocurrencies they're not regulated by anyone," says Bartlett. "It's not clear who is responsible for them."

The UK's Financial Conduct Authority, which is responsible for regulating financial markets in the UK, issued a warning about OneCoin on its website in September 2016 but subsequently deleted it. Such warnings didn't stop the money pouring in from all over the world. Dr Ruja's supporters dismissed the sceptics as 'haters'

'HATERS'

The term 'haters' came up a lot during Bartlett's investigation. "Every allegation we made we would put to OneCoin," he says. "It was multiple times. They said our report would be biased because we were talking to haters."

According to The Missing Cryptoqueen podcast, Norwegian Bjorn Bjercke was offered a salary of £250,000 in 2016 to build OneCoin's blockchain technology but turned it down largely because this should have happened much earlier.

What propelled OneCoin around the world was the involvement of



multi-level marketing which was co-ordinated by its marketing affiliate network. MLM is controversial because usually only a small number of people make all the money. "MLM is the key to understanding how it works," Bartlett explains. "In some senses it would be better to call it a MLM scam rather than a crypto scam. It's a classic pyramid scam that uses a fake cryptocurrency as the product with Dr Ruja as the face."

By the autumn of 2017 Dr Ruja seemed unstoppable but then she disappeared and hasn't been seen since. Bartlett believes she is still alive, but admits there's a chance she's dead. It's been rumoured that OneCoin was linked to organised crime syndicates in Eastern Europe but Bartlett prefers not to speculate.

Although it's estimated that €4bn was invested in OneCoin, some people think the figure could be as high as €15bn with victims coming from as far away as China and Uganda.

OneCoin's website has been taken offline but Bartlett said it's not the end of the story. "The wheels might be coming off, but OneCoin still exists," he says.

Rather depressingly, Bartlett predicts there could be another OneCoin scandal. "It's the strangest thing I've ever worked on. It's a whole world I never knew existed. It opens up your eyes about how easy it is to deceive people by hype."

ONECOIN TIMELINE

2014

Dr Ruja Ignatova founds OneCoin with brother Konstantin Ignatov in Sofia, Bulgaria

H1 2016

British people invest €30m into OneCoin

June 2016

Dr Ruja declares OneCoin a 'Bitcoin killer' at Wembley Arena

Sept 2016

FCA issues warning on its website

Oct 2017

Dr Ruja fails to show for OneCoin event in Lisbon, Portugal

Oct 25th 2017

Dr Ruja boards Ryanair flight from Sofia to Athens and disappears

March 6th 2019

Konstantin Ignatov arrested by FBI in Los Angeles and charged with fraud

March 2019

Dr Ruja charged in absentia for wire fraud, security fraud and money laundering

November 12th 2019

Konstantin Ignatov pleads guilty

INSIDE ABBEY ROAD RED

THE STUDIO WHICH LENT ITS NAME TO THE
SEMINAL BEATLES ALBUM TURNS 90 NEXT YEAR
AND HAS A LONG TRADITION OF INNOVATION - ONE
WHICH IS CONTINUING WITH ITS RED INCUBATOR
FOR CUTTING-EDGE MUSIC START-UPS

Words: Yasmin Duggal

To step inside Abbey Road Studios is to step into music history.

Some of the world's most famous and influential albums have been recorded here, including Pink Floyd's *Dark Side of the Moon* and OK Computer by Radiohead. Studio Two, which was used to lay down much of The Beatles' best-loved work, features pictures of the Fab Four as well as Kylie Minogue and Oasis.

Now a Grade II-listed building, its endearing popularity is evident among the queue of tourists waiting to have their picture taken on the iconic pedestrian crossing – which also has protected status. Even Studio Two's original wooden flooring remains in place.

What is perhaps less well-known is the history of innovation at the St John's Wood institution. From the creation and patenting of stereo in 1931 to holding the blueprint for the modern recording console, the walls and feel of the three-storey townhouse lay claim to a heritage which changed music forever.

Fast forward to 2015 and the studio launched Abbey Road Red. The first music-focused technology incubator in Europe, it mentors start-up music businesses to build on almost 90 years of technological advances.

"We're an incubator, not an accelerator," Isabel Garvey, managing director of

Abbey Road Studios, explains to BusinessCloud. "The support is bespoke, and it's very much about growing the ethos of the founder."

VISION

Having worked across the industry for 14 years at the likes of EMI and Warner Music International, Garvey has experienced the era of digital disruption first-hand. She had her own vision for Abbey Road. "I got a call to look at the studios and asked myself what it could look like in 30 years' time. If we want to be relevant, we need to have a brand presence before and after you come into the studios – and that means being really deeply engaged with tech.

"I was somewhat cynical of what we would find in the digital marketplace, but was pleasantly surprised with the quality of start-ups and technologies we found. As a brand platform, we thought we could be really valuable in helping start-ups shout about what they're doing by using the talent in the building."

Red offers a unique programme to suit businesses' needs over a six-month mentorship, including expertise from Abbey Road residents, access to the studios, financial advice and an outstanding platform for exposure. "It gives us the opportunity to go really



slow, get to know the founders and not force them into any position that won't help the business," says innovation manager Karim Fanous (pictured opposite with Garvey), who came on board in 2018 having immersed himself in tech at industry strategist Music Ally.

Garvey concurs. "We discuss what they want to get out of the next six months, and it really varies. We encourage the businesses to be strategic in terms of what investors bring to the board and how that supports the business. We add most value to businesses that are post-seed financing."

DEMODOY

We are speaking to them before Red's annual Demo Day in Studio Two, where the latest start-ups to graduate – LifeScore, MyPart and Audoo – will be presented on-stage. Abbey Road Red has now mentored 15 companies which have collectively raised almost \$40 million in funding with a valuation in excess of \$200m. The incubator has moved from a yearly application process to sourcing start-ups through constant monitoring of the music tech scene, which better reflects the constant nature of innovation in broader technology.





The passion Garvey and Fanous clearly have for the project is evidence of the human element lying at the crux of what they can offer new businesses. "I think that's what makes it really special. The reason we only take on four or five a year is because we have to invest a lot of time and understanding. It's very human-led," says Garvey.

However intelligence of the artificial variety is also apparent at Red, which Garvey says can augment the inherent originality in music. "Everyone in the 80s and 90s thought the synthesiser meant the end for music because you didn't have to be skilled anymore, but it actually created new genres. AI might just bring about a completely different listening experience – but it will never replace humans."

MYPART

Start-up MyPart (above) is a marketer's dream – an algorithm which helps people find the perfect music for their advert or video.

Founders Ariel Toli Gadilov and Matan Kollnescher are working with leading music execs to catalogue millions of songs forgotten in the archives and make them searchable for brands and companies. It does this through song mining: the ability to deeply comprehend lyrics and music using AI.

Kollnescher worked for seven years for an intelligence agency and also studied music at university. "At some point these worlds collided, and I realised that technology could be utilised to change the way that we search for relevant music," he explains.

We're joined in the interview at Abbey Road by president Ronny Vance, who describes himself as an "old-time music business guy from the States". Having run companies for David Geffen, worked at 20th Century Fox and signed Tupac to Interscope Publishing in the 90s, he explains how he and Gadilov – a former risk manager at Intel – were both attracted to Kollnescher's romantic idea of helping songwriters around the world.

"We went to LA and called upon my pals that run EMI, Sony and Geffen etc. One guy in particular – the head of Universal on the West Coast – asked if we could help him before helping the whole world," Ronny recounts.

Kollnescher explains: "Music publishers and record labels end up with catalogues of millions of songs, and these are immensely valuable but too vast for one person to grasp. One way of dealing with that challenge is tagging. We wanted to do something deeper that actually comprehends and captures the magic of music.

"Our software takes apart the aesthetics and the semantics of what's in the song musically and lyrically. You input a couple

of songs that you feel have something in common and MyPart identifies the coherences between them. It then takes that fingerprint and looks through millions of songs, finding songs that have similar secret ingredients in them."

The team at Abbey Road Red was enthusiastic about the opportunity of opening up MyPart's product to a wider demographic of disenfranchised songwriters when the start-up came on board in June 2019. MyPart "raised its first dollar" two years ago, and that total has now reached \$1.5m with the support of Red.

"We started understanding that there is a lower-hanging fruit which is far easier to get on board," explains Kollnescher. "We're now at the stage of negotiating with three major publishers and several major record labels. We want to open up the platform to anyone so we don't have the limitation of analysing a million songs."

LIFESCORE

Imagine a soundtrack to your own life – a personalised score which ebbs and flows according to how you are feeling.



Start-up LifeScore has made this a reality with an AI platform developed in part by Siri co-founder Tom Gruber for award-winning composer and cellist Philip Sheppard. "I spend my life putting music to picture – why can't that happen in real time when I'm going for my walk? We all carry technology that can cope with that," asks Sheppard (below with Fanous).

"We don't want to be making artificial music – rather beautiful augmented music. If I've never had any training, why shouldn't I still have the tools to enable me to really feel what it's like to carve music in real-time?"

Mirroring the modern phenomenon of constant memorialising through social media platforms such as Instagram, LifeScore is described as creating a "present nostalgia".

Chief business officer Carl Dalby, a patron of the British Film Institute, resonated with the concept and became involved five years ago after a long period spent in tech consulting and management. Between Dalby, Sheppard and Abbey Road Red, there is an impressive black book of musicians they can contact and subsequently build into their ecosystem.



"We record everything in a studio and sample it properly. We've got the Chamber Orchestra of London and Guy Pratt from Pink Floyd already in our demos. Through wearable technology, a soundtrack is carved to your walk in the forest. The platform picks up on [the human] pulse and movement – it is trigger-agnostic. You press play and never hear the same music again – and it's real music, not machine-generated."

Dalby adds: "If it moves you, you can also share, save and replay the score you created."

Dalby demonstrates the incredible tech using his phone: as the device is turned over, it quietens; then as it is turned and lifted, it gains renewed emphasis through the seamless adjustment of levels or addition of instruments.

So is LifeScore set to change the landscape of how we digest music? "It's definitely not a replacement for things like Spotify and vinyl," the pair insist. "We're not looking to threaten the record industry – we're hoping to look at new behaviours."

Artists who called Abbey Road home

THE BEATLES

PINK FLOYD

FLORENCE AND THE MACHINE

KANYE WEST

CLIFF RICHARD

THE HOLLIES

KATE BUSH

RADIOHEAD

OASIS

MIKE OLDFIELD

JAMIROQUAI

THE KILLERS

NICK CAVE

TAKE THAT

MUSE

THE LONDON SYMPHONY ORCHESTRA

LADY GAGA

AMY WINEHOUSE

KYLIE MINOGUE

ELVIS COSTELLO

ROBBIE WILLIAMS

AUDOO

CEO Ryan Edwards was walking through a famous department store when he heard his top 10 hit Domino Effect by noughties indie band The Lines playing.

Looking deeper, he found that no royalties were paid for the airing – which led him to wonder how much money he was missing out on and eventually to found Audoo. “What Audoo does is recognise audio that’s played in commercial spaces – gyms, pubs, retail outlets. The challenge is that nobody really knows what’s been played when it comes to royalty payments,” he says.

“We’ve created an ‘audio meter’ – think of it like a smart meter. You’d have one in every commercial premises to capture what’s been played and report it back so the money goes back to the right artist. We’ve built a digital fingerprinting engine with a massive library of music which came from Abbey Road and Universal, and essentially you match two fingerprints together.

“Any public space playing music is required to have a commercial licence – similar to a TV licence. We’re currently working with royalty societies so that audio meters will be sent out on renewal of these licences.”

The team met Abbey Road Red in early 2019. Now nearly 18 months old, it has grown from two to 10. In the last six months Edwards has taken the concept to Australia, Ireland and the US, gaining traction in commercial conversations as they go.

“The biggest advantage was working with Universal and getting access to their catalogue. They got us to the right people. We’re now in commercial negotiations in a couple of territories around the world to go and launch in a full market later this year,” explains Ryan.

Audoo will shortly launch its pilot across 250 locations in the UK and within a variety of commercial environments.

The alumni

CloudBounce

Cloud-based online mastering service combining machine learning and autonomous processing to provide a fast and cost-effective alternative.

Uberchord Engineering

Start-up behind app which combined chordal recognition with adaptive learning to help people to learn to play the guitar.

Titan Reality

Developing advanced musical interfaces using 3D sensing technologies and physical modelling techniques.

The Audio Hunt

Online marketplace and community that gives musicians, engineers and producers access to audio gear and services.

Qrates

Unique all-in-one integrated crowdfunding solution for releasing music on vinyl.

Scored

Next-generation library music service combining a user interface with a new form of dynamic composition, allowing users to adapt music to fit their productions.

Vochlea

Software capable of taking the humming or singing of professional musicians and translating it into an instrument.

AI Music

Machine learning that empowers and harnesses the dynamism behind music and audio.

Lickd

Third-party subscription-based platform which pre-clears music from right-holders through deals with labels and companies.

Humtap

Generative composition app that turns your humming into original music across a variety of genres almost instantly.

COTODAMA

A wireless, translucent speaker with real-time animated lyrics that scroll across the front while high-quality sound blasts from speakers at the back.

BROOMX

The MKplayer360 is an immersive projector offering a different kind of interactive, visual experience, allowing you to pick from a library of audio-visual content.



Data intelligence can protect your business



**UKFast CTO
Neil Lathwood
explains how
automation
can protect
businesses
against security
threats – and
where this
technology is
headed**

At UKFast we have a wide variety of security products which generate a lot of data when there is an event such as a distributed denial-of-service attack, threats to a customer's infrastructure or hosted applications or log data from firewalls and web application firewalls.

We ingest this vast quantity of data and analyse it alongside third-party data – such as static blocklists or other streams of information made available from vendors or open data sources – then process it into various formats and utilise it to make automated decisions across our network and products to protect clients.

It has to be done in real-time, 24/7, because security never goes to sleep. The bad guys are always out there,

whether it's 2am or 2pm, and we need to ensure that our clients' applications and infrastructure are protected.

If it's the early hours of the morning, we don't want to be ringing a customer to inform them of an attack and asking them how they would like us to react. We want to act on their behalf to protect them immediately then send a message to let them know of the attack and what measures have been put in place to mitigate the attack.

So whether it's mitigating against sudden DDoS attacks or protecting them from web application attacks such as SQL injection, we're constantly monitoring this and using the data we've already got to mitigate against them.

This analysis is mostly done automatically using smart technology tools. It would be impossible to do it in a fully manual fashion: you would need an army of staff and the end result would be far inferior!

Using automation, we can also start making calculated decisions based on the sector that clients are in. For instance, we've got quite a wide range of customers who host gambling services: if one of those customers is being subjected to a DDoS attack, or being blackmailed, we then have pre-emptive data which tells us that this could potentially happen to other people within that same

sector. We can then put the same mitigations in place across all those customers rather than just one of them, in turn providing an extra level of proactive security rather than the traditional reactive type.

The wider the variety of customer base that we have and the more different types of attacks that we see, the more data we have to make these real-time decisions on behalf of clients.

Over the last few years, processes have become more and more automated in all sectors, and security is no different. Once upon a time you had analysts essentially looking at static lists of data and making decisions based on that; nowadays this is all happening automatically and in real-time. Rather than having to expand the team around the product you're offering to be able to cope with the increased demand, how you automate across all aspects of analysing data – then make decisions based on that – is what makes the difference.

Over the next five years we will see an increase in the ability to predict attacks before they happen – and therefore protect clients against them. Take zero-day viruses and vulnerabilities, where the information surrounding an attack is yet to be publicly disclosed: the organisations who get hit on day one are the guinea pigs that software and antivirus vendors then use as a case study to patch the software or release the updated definitions of antivirus to protect other companies or software technology stacks.

Currently, there is always somebody who loses in that situation, but it would obviously be much better if you could actually start to mitigate against some of these threats before they even happen. In the future, we should be able to apply machine learning to data across various platforms to do this in real-time and to start predicting the likelihood of such things as DDoS attacks.

That is where our advancements are now going: security which is more proactive than reactive and protects everybody from day one.

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COLLABORATIVE WORKSPACES

As WeWork slims down and other collaborative spaces spring up, property entrepreneurs and tenants explain all you need to know about co-working

Words: Jonathan Symcox



Technology start-ups, freelancers and scaling businesses are increasingly turning to collaborative methods of working.

It is a phenomenon which began in California in the 1990s as fledgling tech entrepreneurs and workers banded together in shared apartments and houses as part of the 'dot-com boom'.

There is now widespread recognition that great ideas only manifest as great platforms and products when they are bounced off other people. So where better to start that process off than in a co-working space?

"It's maybe the alternative to the spare bedroom at home for start-up entrepreneurs," Colin Shenton, UK CEO at 'pay-per-minute sitting room' Ziferblat, tells BusinessCloud. "People are sociable creatures and it can be quite soul-destroying to just sit at the dining table all day and continually have to motivate yourself.

"However co-working is not the same thing as a traditional serviced office. It is supposed to be short-term and flexible, but not necessarily more expensive. It's just a different way of running your office portfolio."

One company which has incorporated co-working into its portfolio is Bruntwood. Josh Hancock, head of

commercial at Bruntwood Works, explains how this works in a building such as Neo in central Manchester.

"We've got every product line in the same building. An artificial intelligence company called Peak has taken the entire top floor, but they still benefit from the collaboration," he says. "Peak have certain teams that work on projects and you might find them working in the pods outside, in meeting rooms, within the shared space.

"As a start-up begins to scale you can move up and down – and even the larger businesses in the building can still benefit from all the shared space."

OBI Property worked with Allied London on the Bonded Warehouse at the old Granada Studios site.

"We've seen a shift," OBI director Will Lewis says. "Before the Bonded Warehouse, we spent a lot of time looking at co-working in New York.

"They had massive open spaces for people to work in but also areas with sort of stable doors – so they weren't completely closed off – for groups of maybe 8-10 people. That was their space.

"I think people do like an element of privacy, especially when they reach five people or more."

Is it better than working from home?

Firmware engineer James Hough, who has worked on projects for the likes of Jaguar Land Rover and Barclays, abandoned a serviced office to work from home but is open to the idea of moving into a modern space which offers hot-desking – where you don't have a dedicated desk – or co-working, where you do.

"My last experience of a serviced office in Rawtenstall [in Lancashire] was a nice big old mill which had been made into boxes. I was there 18 months and I saw one resident, so there was no social aspect," he says. "There was a monthly business breakfast, but nobody attended.

"I used to develop products and sell them as an entrepreneur but after building an office at home, I lost all that creativity and impetus because there are no external influences.

"However some people I know who are in co-working offices get nothing done because they're too busy socialising! It would take a big push to step away from my office now after having the convenience of being at home."

Lucy Menghini, co-founder of eCommerce firm Six Stories Bridal and podcast agency Hear and Tell, says: "Co-working can prevent that feeling of isolation and just being out of the loop. Otherwise you can very quickly fall into this pit staying in your pyjamas all day – you stay inside your own mind."

"The underpinning thing in a co-working environment being successful or not is community. How do you create that real solid tight-knit community that will add value to each other's experiences?"

Is an amazing community guaranteed?

IWG is headquartered in Luxembourg and provides thousands of workspaces in around 130 countries. Its UK CEO Richard Morris told BusinessCloud last year that it was looking to increase the number of its locations around the UK from 400 to 3,000 in the next five years.

Formerly known as Regus, its upcoming facility on Deansgate in Manchester will provide 120,000 sq ft of serviced office space across 12 floors and be the largest of its type in the UK, according to area manager Scott Gray. BT has taken the top five floors and a co-working space is also planned for the building.

"The underpinning thing in a co-working environment being successful or not really is its community," says Gray. "The challenge I have is that there's such a mixed bag. It's not really industry specific – so how do you create that real solid tight-knit community that will add value to each other's experiences?"

"Supported by our regular networking events and great surroundings I'm optimistic those varied organisations and skillsets will complement each other."

Phillip Bennison, technical director at agency Fablr, is based in Bruntwood's Platform building in Leeds and also works out of Beehive Lofts in Ancoats in Manchester.

"We were in the old Futurelabs space in Leeds and when they closed it down, everyone moved over to [the co-working floor in] Platform. We brought our community with us – and that has been a core part of what's in that space."

"We organise events, we have socials, we do board game nights. It's about the personality of the space."

Do spaces focus on a particular sector?

Jamie Hall is projects director for Profolk Space, a converted Grade II-listed bank building in Stockport which features private offices, co-working desks and event space.

"We focus our space on design, creative and tech industries because they'll be the best people to collaborate," he says. "We've actually turned people down and told them they wouldn't work well with our other clients. It's really difficult to do that as a start-up business, but it's very important."

"The best space I've seen is Baltic Creative in Liverpool. It's amazing. They're a CIC company so everything they do, they put back into the community – and you can really feel it. You walk in there and everyone feels like they know each other."

Michelle Rothwell, founder and CEO at Watch This Space, adds: "We have one co-work space, That Space, which has gone really well. It's focused on the property sector and we've got 19 different businesses in there."

"As a property developer, I based myself in there and there were other people in that same industry such as landscape architects and project managers. It worked well, because we could all bounce ideas off each other."

"From my experience, it only works well if you're really offering something of value."

Is flexibility key to co-working?

Revlifter is an online personalisation tech provider based in a WeWork building in London. After reaching 24 staff globally, it is now looking to potentially expand its office space.

Head of people Samantha Cornwell says: "One of our key considerations when looking for office space is can we grow

in it? We want to make sure we have the flexibility to scale when that time comes."

"Our headcount growth could change in 6-12 months and we don't want to keep moving to accommodate our growth."

Has WeWork been good for the sector?

American firm WeWork was viewed as a huge success story as it rapidly opened hundreds of co-work spaces around the globe and was valued in the tens of billions of dollars.

However a planned IPO was postponed amid mounting losses and accusations of poor corporate governance. It is now selling off many of its subsidiary businesses and cutting staff and services such as free beer and wine for residents.

Property developer Rothwell, who is based in the centre of Manchester, says: "I think WeWork has been brilliant for Manchester and I hope they do survive."

"A growing co-working space is a good indication that we are becoming a more European city because a large proportion of people who take space in these co-work spaces are new to the city."

Hear and Tell's Menghini says: "For a lot of people, they want to pay a little bit extra for a WeWork because you've got that shiny brand."

Indeed that option of hosting investors and clients in style in almost any prominent city is a tantalising one – and also an option for customers of IWG, which is a profitable company.

"If you take a private office, you get a membership inclusive with that. The benefit is you could plug into any of our locations internationally. There's close to 4,000 of them now so it's a huge benefit," says Gray.

"In Manchester WeWork has gone in, secured leases on buildings and spent lots of money kitting them out – then charged about 40 per cent of what should have been their desk rate. I think

that's how they've ended up in this real sticky situation.

"We don't quite go the whole hog with all the services included: you pay extra for your teas, coffees and meeting rooms, so it's more 'pay as you go'."

Ziferblat's Shenton says: "When WeWork started it didn't just provide space – but a directory for all the other businesses based in WeWorks around the world. I could be a graphic designer and find an accountant, send them a message and do business with them."

Revlifter's Cornwell says of its WeWork base: "The breakout spaces are used a lot by our team. At any one moment, you might have five people in our [20-person] space and others could be out – whether it's in a phone booth having a client call, utilising a meeting room or downstairs making use of the in-house barista coffee."

What is the future of co-working?

Shenton says international business Ziferblat is seeing demand for meeting room space from enterprise companies, with 17 meeting rooms available in its three Manchester spaces alone.

"We've just hit a million pounds of annual revenue for meeting room space in Manchester alone – it's averaging £20,000 a week across the three branches and makes up 40-50 per cent of our total revenue," he says.

Menghini's view is that the serviced office, which is less space-hungry for property companies than co-working, may become more desirable.

"I think it might be cyclical and that we will probably go back that way," she says. "I find it really difficult to work in those massive vertical spaces. I think I'd rather sit in a box."

Gray adds: "It's a buyers' market right now: there's a great spread of places that will allow you to scale your business."

"The standard is so high that I think you're going to get pretty decent service, wherever you go."



Will Lewis,
director,
OBI Property



Michelle Rothwell,
founder and CEO,
Watch This Space



Josh Hancock,
head of commercial,
Bruntwood Works



Lucy Menghini,
co-founder, Six Stories
Bridal/Hear and Tell



Samantha Cornwell,
head of people,
Revlifter



Scott Gray,
area manager,
IWG



Colin Shenton,
UK CEO,
Ziferblat



James Hough,
freelance
firmware engineer



Phillip Bennison,
technical director,
Fablr



Jamie Hall,
projects director,
Norfolk Space

INTERVIEW

Revved up for growth

LONDON TECH
BUSINESS REVLIFTER
IS USING ARTIFICIAL
INTELLIGENCE TO
PERSONALISE DEALS
FOR SHOPPERS

Words: Jenny Brookfield

We've all searched for discount codes when shopping online: you're at the checkout but pause to do a quick search for a voucher. After all, there's nothing better than feeling like you've bagged a bargain.

But how often do you actually find a suitable code that saves you some money off the price?

The experience can leave shoppers frustrated and, in some cases, abandoning their baskets, says London-based Revlifter. "You put something in your basket but you want a voucher code so you open up another tab so look for a discount code that works, but when you click on one you realise it's just a sale message or it's no longer in date," co-founder and chief executive Simon Bird tells BusinessCloud.

"The chances are that link is dripping with affiliate cookies so, even if you go back to the retailer's website to complete your purchase, the chances are that retailer will pay commission to that affiliate for something you would have bought anyway.

"The consumer has had a lousy experience looking for something that doesn't work and, even if you do find a voucher that works, the retailer is then paid for a lower sale than would have happened anyway."

IMPROVED SYSTEM

Bird and co-founder Ryan Kilszat came up with the idea of personalising the discount process to benefit both shopper and business. Melbourne-born Bird's background is in affiliate marketing, where publishers – such as a cashback website or site about holidays – drive consumers to retailers and receive a small fee if a sale occurs. But he believed the system could work much better.

"I came up with the idea where I'd say to a retailer 'let me build you your own voucher code page', and I took that hypothesis out to the marketplace a year and a half ago," he says. "If a shopper finds a voucher code on an affiliate site, even if that code doesn't work the affiliate site still gets rewarded for that. It's a massive problem and we're solving it."

The result is Revlifter's AI-powered technology, which reads a shopper's basket to understand who they are as a consumer and then personalises the offers accordingly. "If they have £60 in their basket you could then offer them X per cent off if they spend £80," Bird says. "That way the retailer is saying 'we're willing to give you a great offer but you have to put more in your basket'."



The product, RevPage, was launched 18 months ago and is already used by 90 retailers in seven countries. It processes five million baskets every day and results show order values increase by up to 30 per cent and conversion rates double.

RevConvert launches subtle messages as users engage with a retail site, suggesting products and offers to help people spend more. The specific messages they receive are based on their purchase history and preference as well as the retailer's own objectives. Rules can be built around certain elements to make offers in real-time, such as offers around repeat purchase if the user looks like a new customer.

"We can show the right deal to the right customer at the right time – we see ourselves as a business personalising offers across the internet," says Bird. "We're building retailers an amazing database of offers, applying logic and rules whereas in the past offers have been a fairly blunt instrument. We can allow an offer to be flexed based on a one-to-one consumer level."

US BASE

The business has an office in Atlanta, with Bird and Kilszat believing the US market represents a huge opportunity.

"Americans grow up using coupons so there's a great opportunity for growth there," he says, adding that there is also potential to add other countries. "We're pretty much hearing from a big retailer every week and the ones





that are using us say we're making a big impact on their business because they're engaging more with their customers. We're making happier consumers and happier retailers."

He sees deals personalisation only becoming better as the tech progresses and retailers get on board. "A retailer could sell a pair of jeans to a shopper and then, a year later, they could say 'we noticed you bought these last year, have an offer for another pair of jeans'," he says. "Retailers need to jump into personalisation and we can get a client on board in a couple of weeks."

Revlifter is about to approach a Series A round which will speed up growth and enable it to further develop the tech, with the co-founders harbouring big ambitions.

"We want to be seen as the best real-time incentive personalisation platform in the world," Bird says. "We have global ambitions but we're prioritising English speaking countries first. The US is really important and we see Brexit and all sorts of other things speeding up the process."

Bird, who moved to the UK 16 years ago, has a background in psychometric testing and recruitment tech and was involved in voucher code websites before setting up Revlifter. He has an interest in business growth generally too, sitting on the boards of several other businesses including Move Bubble, which aims to disrupt the rental market, and WeGift, which solves the problem of lost gift cards, with buyers only being billed if a recipient spends the cash.

He also helps out with his local community hall. "I'm very passionate about tech and community," he adds.

Revlifter in numbers

Founded:
2017

Staff:
24

Investment:
£2.3m seed

Clients:
90 retailers in
seven countries

Baskets processed:
5m daily



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Artificial Intelligence: worth the hype?



Yasmina Darveniza, an investor at leading PropTech VC Round Hill Ventures, says AI can have a major impact in real estate

The amount of venture capital money flowing into UK artificial intelligence start-ups hit a record-breaking \$3.2 billion in 2019, making it one of the hottest sectors to be in.

This financial boost, along with bolder algorithms, Big Data and better infrastructure, is bringing founders and funders to the AI equation. Yet according to a recent report, 40 per cent of European firms classified as AI start-ups do not actually use artificial intelligence.

Is AI then just a fad – or is it worth the hype?

AI makes it possible for human capabilities to be undertaken by technology at scale. While rules-based programs have existed

since the 1950s, AI nowadays usually relates to machine learning – providing systems with the ability to automatically learn from data and improve from experience without being explicitly programmed. This can be applied to a wide variety of prediction and optimisation challenges, from predicting when patients will get sick to teaching self-driving cars to understand their surroundings.

To utilise this technology, start-up founders need access to talent around applied AI, access to large and proprietary data training sets, and domain knowledge to provide deep insights into the opportunities within an industry. Founders need to identify a sizeable target market and understand the problem they're trying to solve.

I see no better target market for AI applications than real estate. Not only is it the world's largest and most important asset class, but also one of the last industries to adopt technological change.

A great example is Israeli start-up **Skyline AI**, which takes the guesswork out of investment decisions by training its technology on the most comprehensive data set for US multifamily assets. Mining data from over 130 sources and analysing 10,000-plus data points on each property for the last 50 years, its tech estimates asset value, predicts future performance and discovers investment opportunities.

AI can also optimise both property development time and cost. Nordic start-up **Spacemaker AI** is a development tool used to maximise the potential of building sites. Property professionals can use it to generate and assess billions of possible solutions to multi-building developments in hours – analysing designs for a range of different parameters such as sun exposure, noise pollution and apartment size. The company has partnered with leading developers in Europe including Skanska, OBOS, AF Gruppen and Bouygues to help them reduce critical planning time while increasing sellable space by up to double digits.

Using Big Data and machine learning algorithms, Iberian start-up **CASAFARI** enables a higher level of efficiency and transparency in asset management. The software provides users with downloadable historical and descriptive data sets for all property cases – and is working to build the cleanest, most complete database in its geographies. Asset managers can use it to set data-driven rental prices and identify the best time to sell assets.

AI has almost unlimited potential across multiple industries and especially real estate. Not every solution requires it, but knowing how, when and where to effectively use the technology can be a key lever for start-ups and businesses alike.

 @RoundHillVC

Email jonathan.symcox@businesscloud.co.uk to contribute to our 'On the Money' Insights section

BIGGEST UK TECH INVESTMENTS

These UK-headquartered companies raised the largest funding rounds in Q1 2020

1. Farfetch (London)	£190m
2. Snyk (London)	£114.8m
3. Oxford Nanopore Technologies (South East)	£110m
4. Arrival (London)	£85.6m
5. Options Technology (London)	£76m
6. Currencycloud (London)	£61m
7. Receipt Bank (London)	£55m
8. Partnerize (North East)	£38.4m
9. Liberis (London)	£32m
10. Demica (London)	£22.8m



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INTERVIEW

THE 'ELECTRICITY' POWERING UK START-UPS



WHAT DO TRANSFERWISE, MONZO AND DELIVEROO HAVE IN COMMON WITH FACEBOOK AND OTHER SILICON VALLEY HEADLINERS? THE ANSWER IS 'CONTINUOUS INTEGRATION' PLATFORM CIRCLECI, WHICH IS HELPING THE WORLD'S FASTEST-GROWING TECH START-UPS STAY AHEAD OF THE COMPETITION

Words: Alistair Hardaker

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Rapid growth is a problem any start-up would love to have – but for tech firms, it can prove a minefield.

As their user base grows, meeting sky-high customer expectations can become difficult as they seek to evolve as a business and add features to their fledgling product. The modern 'agile' way of working – where companies embrace continuous change and become more responsive to the customer-driven marketplace – is vital to remaining at the cutting-edge.

Step forward build platform CircleCI. The San Francisco-based platform is a pioneer of 'continuous integration', which is a term rarely spoken outside the walls of fast-growing tech start-ups – but is fundamentally a straightforward concept.

When two or more brains begin tackling a single project, mistakes, misunderstandings and miscommunication are inevitable. Vast, ever-growing machines like

from a build, test and release perspective," Jim Rose (pictured opposite page), CEO of CircleCI, tells BusinessCloud. "It's like electricity: it's that thing that you absolutely need, and you don't want to think about it, you just want it to work.

"If something breaks, we want to alert you immediately, and then you can go fix it, so that you can get back to your day and do the thing that makes you special."

Launched eight years ago in California, the firm made its first venture into the EMEA region with the launch of a London base at the end of last year. Its second international hub after Japan, the new Shoreditch office is designed to be a closer option for clients other than its Silicon Valley headliners Facebook, Spotify and Kickstarter.

London equivalents Transferwise, Monzo and Deliveroo are also customers, and have experienced the 'good problem' of fast growth, which leaves them financially stable, but time-poor.

"They're trying to

figure out how to get platforms and processes and standards in place to help them manage their growth," Rose says of Deliveroo.

Rose's previous venture, CI firm Distiller, was bought after only eight months by CircleCI, and he was appointed to COO. Now CEO, he has welcomed tech veteran Nick Mills to drive adoption and business growth within the EMEA region. On London's tech scene, Mills adds: "They all seem to use integration and continuous



delivery as the critical enabler to help them rapidly accelerate the speed with which their engineers can work – and ultimately products and value that they can create."

About 10 per cent of its employees are based in the new UK office, serving the region which accounts for around 20 per cent of its business. However the majority of its workforce is remote. "They are working from somewhere, their home, a cafe, the beach, wherever they happen to be," says Rose.

Rose points to one of the company's now departed founders, Paul Biggar, who is from Dublin, when talking about its roots in Europe. "We've always had a strong footprint on the engineering side and on the product side, in the broader European market," he says. "We're now investing in those areas to help customers that already have the platform to grow by having local resources, local support, people inside of the country, and really help feed their growth over time."

Getting in on the ground floor is CircleCI's business strategy. By targeting promising start-ups with the good problem of being busy, the firm hopes to help developers to embed the product into their projects early, and to bring CircleCI along as they grow.

Rose, talking at once about his younger self and future potential clients, says timing is crucial and mistakes are inevitable, but repeating mistakes is something to avoid. "When you start out as a 24-year-old CEO



Spotify and Facebook are powered by many tech brains, each working on a single cog which has to fit perfectly.

When the gears do grind, it costs these machines time, money and the threat of global outcry from millions of users. The modern CI process, used by these very tech giants, is a set of tools for checking the cogs – or in this case code – to ensure things keep spinning.

"A CI platform automates all of the compute requirements that you have

INTERVIEW

you have a vision, but not a lot of intelligence or experience in terms of what to pay attention to," he says.

"Even if you're the greatest entrepreneur with the greatest entrepreneurial team, there's still an element of timing and luck involved with all great businesses. Over the course of your career, you just get better at identifying patterns and not making the same mistakes."

And that is the pair's pitch: the introduction of automation helps to avoid tripping up over the same mistakes again and again. "The average cost of a developer minute in Silicon Valley is about \$1.42, and that's just every minute that a developer has in a seat and the meter is running. Whereas the average cost for a machine on the CircleCI platform is six-tenths of a penny, so it's 237 times less expensive," says Rose.

"If there's any tasks that you do more than twice, those are great opportunities to basically outsource and put them on a platform so that you don't have to think about it. That is an incredibly powerful concept – and it's the thing that really propelled this business in the beginning."

In the EMEA region, this pitch is now the responsibility of Mills (below). "There's obviously been some challenges in Europe over the last few years from a perception perspective, but I haven't seen anything changing in terms of the amount of companies launching and talent in the market here," he says.

"There's a lot of talent, and there's obviously a fantastic ecosystem here including accelerators, incubators, VC firms, as well as M&A, banking specialists and legal specialists."

In fact, Rose adds, every business is a software business and potential client. "Most companies are realising that they're in a software business at this point," he says. "The primary channel between themselves and the customer is usually mediated by some kind of screen which is running software. Companies are really wrestling with that reality at different rates."

As the agile approach to business grows beyond the likes of eCommerce, gaming and FinTech, so too does CircleCI's client base widen.

"Every company is trying to figure out how to be more agile from a software development perspective, and we're just one of those tools. So regardless of whether you're delivering a banking product, or a new eCommerce experience, or trying to launch a rocket, it's basically the same underlying process," concludes Rose.



AGILE PROJECT MANAGEMENT PRINCIPLES



- Individuals and interactions over processes and tools
- Working software over comprehensive documentation
- Customer collaboration over contract negotiation
- Responding to change over following a plan

CIRCLECI IN NUMBERS



Founded in 2011

Runs 30m jobs per month

Used by 600,000 developers at 30,000 companies

\$115.5m VC funding

BIG-NAME CLIENTS

deliveroo

monzo

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Driverless future needs tech for busy cities

WORDS: ALISTAIR HARDAKER

CEO OF LONDON FIRM WHICH IS RETHINKING HOW SELF-DRIVING VEHICLES NAVIGATE BUSY STREETS WANTS TECHNOLOGY TO BE GLOBAL STANDARD

The CEO and co-founder of a London-based AI firm says the tech must be focused on busy cities rather than "sunny California Highways".

Humanising Autonomy has developed a way to predict pedestrian behaviour from inside a vehicle. Returning from CES, where the company demonstrated its technology on the

streets of Las Vegas, Maya Pindeus said the vision for the firm is to build a "global standard for human interaction with automated mobility".

Without technology of this type, Pindeus predicts that autonomous vehicles will not be capable of navigating the tight streets of busy cities with safety and efficiency.

"If the automated revolution is to happen, which we believe it will, it has to function not just on a sunny California Highway but in real cities," she tells BusinessCloud. "Our focus is what we believe to be the missing, crucial key in order to make automated vehicles at scale a reality."

Pindeus co-founded the firm with chief product officer Leslie Nooteboom and CTO Raunaq Bose. She says the start-up is now focused on winning more contracts and licensing the technology.

It is already working with the likes of Transport for London, Arriva and Airbus to help better predict the actions of those potentially in the path of a vehicle driven by computer. "Without being able to understand what pedestrians, cyclists, wheelchair users – the most vulnerable road users – in any city are doing, the technology remains unsafe, so there won't be a large-scale adoption of automated vehicles in cities such as London and Tokyo," she says.

Without it "the billions and billions that has been put into autonomous vehicle development won't happen", she adds.

The software is built to sit alongside existing navigation software in modern vehicles such as fully autonomous, semi-autonomous and fleet vehicles. It doesn't do the driving; instead, it plugs into any



existing hardware and software to add a similar intuition to that of a human driver.

Autonomous vehicles already have the ability to recognise when a pedestrian is in the road in order to avoid a collision, but Pindeus said Humanising Autonomy's technology can predict what a pedestrian or cyclist will do next, which gives back crucial seconds to make alternate manoeuvres.

"The vision for us is to build a global standard for human interaction with automated mobility," says Pindeus. "There needs to be an entity that defines what is safe and when it is safe enough to operate in pedestrianised environments."

The company, which is based in the centre of London, is currently focused on use in densely populated cities. Its team of behavioural psychologists and technologists use their local streets

to test extensively in Soho and Covent Garden, as well as in cities such as Japan and the US. And while pedestrian safety is always the most pressing concern, she says that without the ability to predict pedestrians' intent, traditional software remains overly cautious.

According to Pindeus, vehicles without this human-like intuition have to be very careful in busy environments "meaning it can't really drive at normal speeds around people".

She adds: "Every time a car would see a person, it would have to slow down or stop completely. This leads to a lot of false positives. If a vehicle has to be so cautious around people that it actually doesn't even get to move properly, that means that there will likely not be any adoption of the technology."

The firm's AI-powered tech quantifies data points including a pedestrian's intent to cross the road and if they

are looking at their smartphone. More than 150 of these factors are currently analysed, with more in development. These factors combine to give a car a 'risk index' of every pedestrian. This also takes into account broader influences: a pedestrian or cyclist in one city may act differently at the roadside than those in another.

Pindeus explains that a "fusion between behavioural psychology and deep learning AI models" makes these differences possible to learn from and better prepare for. "We quickly realised that cultural behaviours are different from location to location or environment to environment," she says.

The technology is claimed to be capable of spotting dangers more than two seconds earlier than a human, and though the firm is keeping statistics close to its chest ahead of the publication of a whitepaper, Pindeus says the team counts every preventable accident avoided as a win.

"We don't provide the decision-making; that lies with whoever provides it, which is likely to be the manufacturer," she explains. "The liability and responsibility of the vehicle always lies with the OEM [the original equipment manufacturer]. We provide a likelihood of any event happening.

"Our approach is to say that this is the crucial technology that every manufacturer and every supplier requires, and there's no way around it."

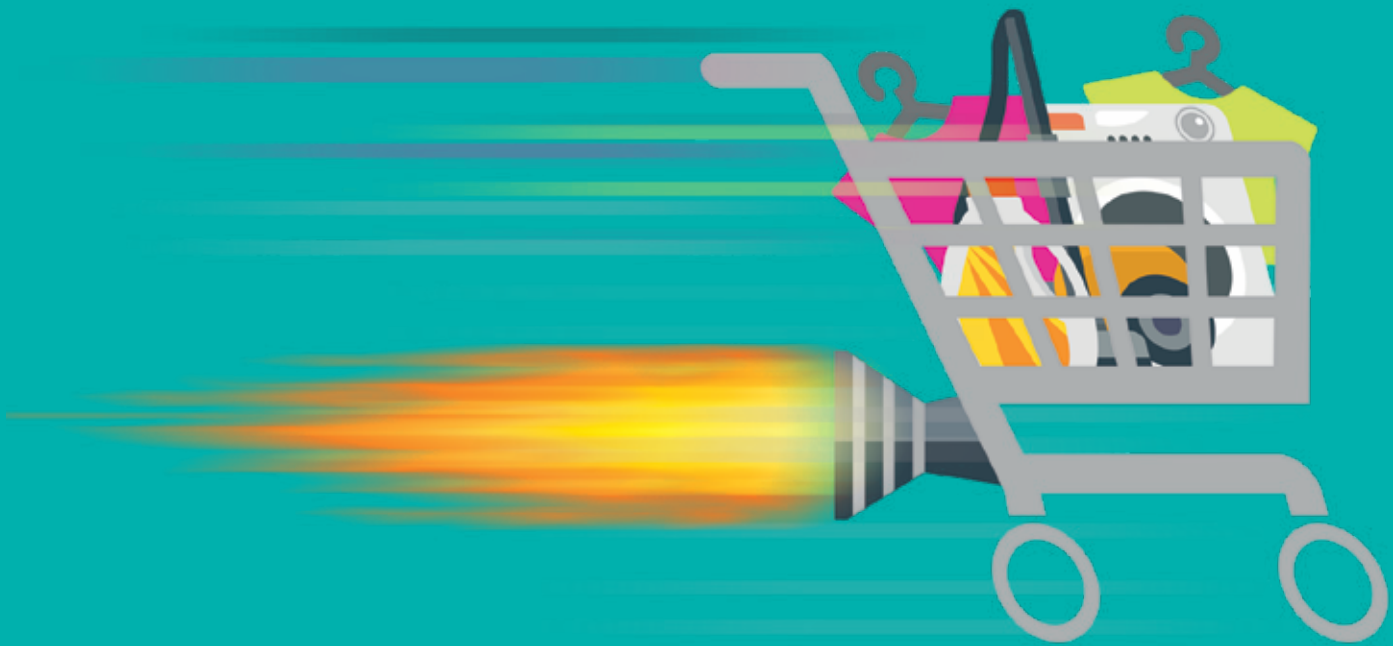


HUMANISING AUTONOMY IN NUMBERS

Founded: 2017

Staff: 25

Funding: \$5.3m (seed)



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Marc Schmid, founder, Redmoor Health

"Although there has to be a named person in overall charge of data, I believe that every staff member has a responsibility for data and GDPR. You can introduce lots of checks and balances but ultimately any system is only as strong as the weakest link."



Nicola Weedall, founder, Autopaid

"Everyone has responsibility, from the person or company who initially provides it right through to the people in your organisation. It's also an organisation's responsibility to ensure third party suppliers they use have adequate data security procedures in place ahead of providing access."



David Chamberlain, co-founder, Viddyoze

"It depends on where the data sits: it could be on-site or off-site. If it's outsourced externally to a data storage company or cloud provider they'll normally have some responsibility for it but you have to remain vigilant yourself."



Pete Hanlon, CTO, Moneypenny

"The data protection officer is the figurehead, but it's a company-wide responsibility... from the technology teams ensuring data is transmitted and stored securely, ensuring the supply chain is secure, access controls are enforced and that DLP (data loss prevention) solutions are in place."



Chris Bulmer, head of sales development, Linten Technologies

"Data responsibility is owned by the data controller under GDPR. However, it is ultimately always the responsibility of the business owner or MD to ensure this is managed correctly as, despite appointing someone internal, they will be held as responsible."


Daniel del Soldato, head of communications, Wireless CCTV

"Businesses tend to compartmentalise any responsibility as belonging to an individual or department. With data security, that just isn't an option. So while we have a Data Protection Officer and a steering group, we've made it part of our wider culture through regular training and reinforcement."


Richard Hagan, managing director, Crystal Doors

"When GDPR was introduced we had to clean our data and we're very responsible about how we handle it. Because we collect commercial information we test our cybersecurity every couple of months. The responsibility ends with me but the whole company takes it seriously."


Dianne Walker FCA, non-executive director

"The general public is now much more educated about data breaches, their rights, the regulations and the consequences. While accountability starts with the CEO and board, cybersecurity is a shared responsibility across every function and level."


Rob Mukherjee, director of transformation, EveryCloud Security

"Many businesses who use the likes of AWS, Microsoft and G-Suite assume that those cloud providers are responsible for the security of their data. Don't kid yourself. Your business is responsible for what goes on with your data in the cloud."


Michelle Rothwell, founder, Watch This Space

"Data is critical in business so how it's stored and transmitted is a big priority. Larger companies have a data protection officer, but it's vital that all the companies have the right culture when it comes to data."


Adam Pritchard, founder, ShopIt

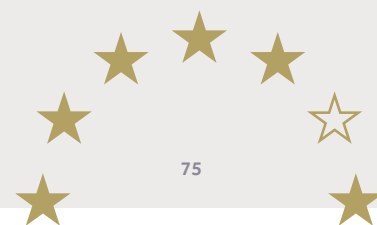
"There is the data protection side; then there is the Big Data and marketing data. Any eCommerce company will be getting streams of data on their browsing and buying customers. It can be overwhelming. Data is only as useful as what you do with it."


Elizabeth Clark, co-founder, Dream Agility

"The key is to put processes and software in place that, wherever possible, removes the need for people to export and send data. Nobody is able or allowed to download or email sensitive data in our organisation. Our rules on retaining and deleting data are strict and adhered to."


Peter Denby, director, Hyper Group

"For modern organisations, the intelligent use of data should now be table stakes. Some data tasks will need specialist skillsets, but people across an organisation should be empowered to easily interrogate data to answer their pressing business problems, realise opportunities and mitigate risks."



CES 2020's top gadgets



Gavin Wheeldon highlights the gadgets which lit up the Consumer Electronics Show in Las Vegas, which turned 50 this year

1. TECHNICS WIRELESS EARBUDS

The beautifully designed EAH-AZ70W buds come with adjustable noise-cancellation, 18-hour battery life and excellent sound quality.

2. SONY VISION-S CONCEPT CAR

An ultra-wide screen shows driving information and is also a high-tech visual entertainment system. Image sensors can also analyse the road ahead – but Sony does not plan to release the vehicle commercially.

3. LENOVO X1 FOLD

The world's first foldable PC is the flashiest piece of tech that Lenovo has produced. Comes with an Active Pen for content creation and a Bluetooth Mini Fold Keyboard which charges wirelessly.

4. ONEPLUS CONCEPT ONE

OnePlus can make the camera lens on your phone 'disappear' by shooting an electric current through the glass. It's unlikely that you'll ever be able to buy the OnePlus Concept One itself – but the technology may be coming to their standard smartphones.

5. MARSCAT

This £699+ robotic cat from Elephant Robotics responds to touch, voice and can even play with toys. A great substitute for those who have allergies or live in rented accommodation.

6. SAMSUNG SERO

This 47-inch 4K QLED Smart TV is straight out of a sci-fi movie! It changes viewpoint so you can watch Facebook, Instagram and Snapchat videos in portrait mode.

7. SAMSUNG NEON

Surely the most incredible announcement. STAR labs (Samsung Technology and Advanced Research) is doing its best impression of Delos from Westworld with this artificially intelligent digital avatar which has its own personality and can also remember and learn.

8. RAZER E-RACING SIMULATOR

This driving simulator will probably cost more than your actual car! A hydraulic racing seat, high-tech gaming wheel and pedals are combined with a 128-inch curved projection screen offering a 202-degree field of view. A separate motor tightens the racing harness as you drive, while pitch and roll movements fully recreate the suspension and vehicle movements of a real race car.



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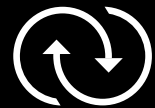
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