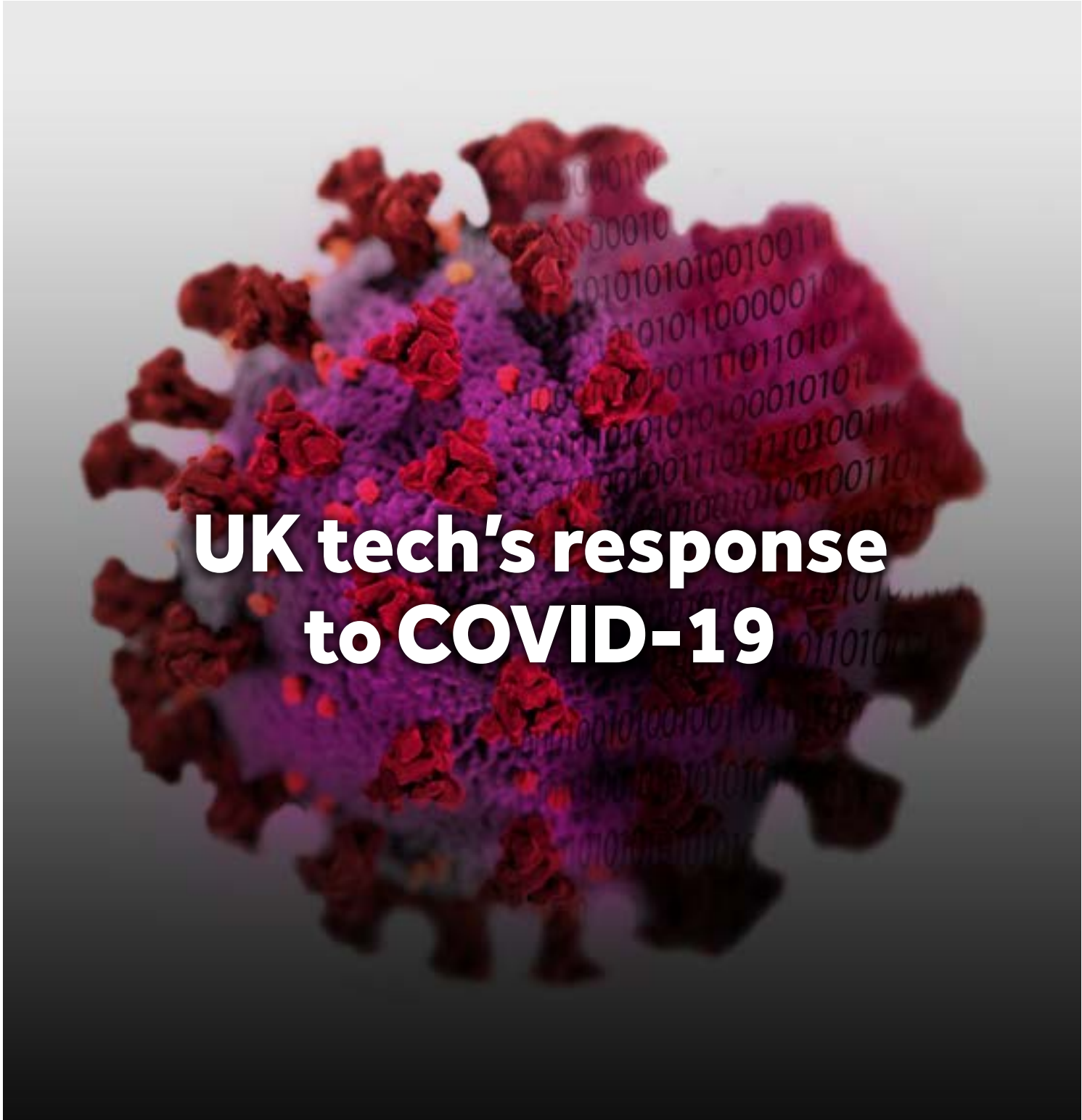


DEMYSTIFYING TECH



UK tech's response to COVID-19

Children's cancer app

100 HealthTech Pioneers

Control your data

Fuelling Growth From Tech.

h*j*

Are you ready to start an online fitness or nutrition business? Looking to engage gym members with a bespoke app? Or are you dissatisfied with the current performance of your eCommerce platform and looking for a new solution?

Whether you're an ambitious start-up retailer or a well-established fitness brand, Harper James has a robust software or eCommerce solution for your business.

Speak to a Harper James expert today on
0845 45 88 444 or
team@harperjames.co.uk

harperjames.com

0845 45 88 444

 [@harperjames_](https://twitter.com/harperjames_)

 [Harperjames](https://www.linkedin.com/company/harperjames)



Tech and the great pivot



The last few months have been among the most challenging for years.

COVID-19 forced a rapid shift to home working while lockdown wiped out the customer base in some sectors and had others scrabbling to find new ways to generate revenue.

We at BusinessCloud were fortunate enough to seamlessly transition to our kitchens as we covered the latest

developments in remote working, tech's role in the fight against coronavirus and inspirational business pivots.

Companies of all sizes were keen to tell their own lockdown story. Our website, coronavirus blog and daily email newsletter were packed with news of COVID-19 packages, partnerships and those who had changed their business model wholesale. Our Tech Counsel feature (p74) in this magazine reveals how several businesses adapted and offers advice for the post-lockdown world.

When times are hard, the entrepreneurial mindset kicks in. Dame Jayne-Anne Gadhia didn't flinch from bringing forward a full launch of FinTech Snoop, which helps save users money, as lockdown bit into personal finances (p24). The former Virgin Money CEO also revealed her reasons for stepping down as UK boss of tech giant Salesforce after just six months.

When banks and aerospace companies put their work with YellowDog, which provides intelligent computing power services, on hold, founder Gareth Williams accelerated its work in the life sciences sector (p42). Sometimes the effect of lockdown has been indirect and more difficult to estimate.

HealthTech is front and centre of this edition of BusinessCloud. Our annual 100 HealthTech Pioneers ranking (p9) showcases the incredible innovations coming out of the UK's universities and tech hubs, from video consultations and communication tools to health monitoring and the diagnosis and treatment of disease. We also have a report on HealthTech's response to COVID-19 (p32).

Touch Surgery, our No.1-ranked company, has developed virtual reality and an app to make operations safer for

millions (p21). It has big plans for artificial intelligence in the operating theatre.

Mark Livingstone knows a thing or two about subscription businesses, having founded LOVEFiLM. Now CEO of Pharmacy2U, he explains how advanced robotics enables the fast-growing company to deliver a repeat prescription every 1.5 seconds (p70).

Our feature on Xploro (p48) recounts how entrepreneur Dom Raban was inspired to create the augmented reality app after he witnessed his daughter's experience with cancer treatment. We speak with Dom and 11-year-old Emmie, one of many former Christie patients helping children understand and own the treatment process.

Cera Care CEO Dr Ben Maruthappu MBE is using AI to help keep the elderly in their own homes following its £30m acquisition of Mears Care (p4), while we also reveal the story behind BioBeats, a mental health start-up which began life when founder Dr David Plans died - briefly - on a business trip (p29).

In our 'On the money' guest column (p68), Storm Ventures principal Pascale Diaine offers insight into how COVID-19 might accelerate US capital into UK start-ups, while Purple CEO and BusinessCloud columnist Gadget Gavin offers tips on making videoconferencing fun (p76).

Away from coronavirus, we take a look around the futuristic home of SmartTech consultant Rob Collingridge (p44); report on how Reaction Engines is looking to unlock space and hypersonic travel (p38); and speak with BioPaxium, a Welsh business turning tide of plastic pollution (p64).

We also have reports on Amazon selling (p60) and the ways in which you can take control of your personal data (p54).

Enjoy the magazine - and get in touch with your own stories around COVID-19 and lockdown.

Jonathan Symcox
Editor, BusinessCloud

 businesscloud.co.uk

 [@jonsymcox](https://twitter.com/jonsymcox)

 [@jonathansymcox](https://twitter.com/jonathansymcox)

CONTACT US

Editor Jonathan Symcox: 07826 517 423; jonathan.symcox@businesscloud.co.uk

Executive editor Chris Maguire: 07826 517 409

Multimedia journalist Alistair Hardaker: alistair.hardaker@businesscloud.co.uk

Advertising & sponsorship: sponsor@businesscloud.co.uk

Designer: Richard Salisbury | Writer: Jenny Brookfield

Subscriptions: businesscloud.co.uk/subscribe

Address: BusinessCloud, Archway 3, Birley Fields, Manchester M15 5QJ



FEATURES

- 09 **100 HealthTech Pioneers**
UK's leading health technology creators revealed
- 37 **Tech 50**
Regional innovation rankings for South East, Wales & South West
- 48 **Christie's new cancer app**
AR platform Xploro helps children own their treatment
- 60 **The Explainer**
Selling on Amazon demystified in six questions
- 69 **UK tech investments**
Top 10 funding rounds in Q2
- 74 **Tech Counsel**
COVID-19 and the art of the pivot

INTERVIEWS

- 04 **Cera Care**
CEO Dr Ben Maruthappu MBE on using AI to keep elderly at home
- 21 **Touch Surgery**
VR and app making operations safer for millions
- 24 **Snoop**
Former Virgin Money CEO launches start-up during lockdown
- 29 **BioBeats**
Mental health start-up resulted from founder's 'death'
- 44 **Smartisant**
Inside the futuristic home of SmartTech consultant Rob Collingridge
- 38 **Reaction Engines**
Abingdon company unlocking space and hypersonic travel



42 **YellowDog**
How COVID-19 altered timeline
of high-flying Bristol firm

64 **BioPaxium**
Welsh business turning tide of
plastic pollution

70 **Pharmacy2U**
Dispensing repeat prescriptions
through advanced robotics

REPORTS

32 **HealthTech**
Entrepreneurs and experts on how
sector met COVID-19 challenge

54 **Personal data**
To what extent are you being tracked -
and how can you take control?

INSIGHT

68 **On the Money:
Pascale Diaine**
"COVID-19 will accelerate capital deployed
by US funds into Europe and the UK"

76 **Gadget Gavin**
"Millions had a crash course in video tech
during lockdown - how can you make it fun?"

AI THAT CARES⁺



ARTIFICIAL INTELLIGENCE SPECIALIST CERA ACQUIRED LEADING CARE PROVIDER MEARS CARE IN A £30M+ DEAL ONLY THREE YEARS AFTER LAUNCHING. IT MARKS THE REALISATION OF DR BEN MARUTHAPPU MBE'S DREAM OF KEEPING THE ELDERLY IN THEIR HOMES FOR LONGER

Words: Jonathan Symcox

If you've ever witnessed the waning health of an elderly loved one, you may also have seen in them a grim determination to remain at home.

My own grandmother, who passed away last year, spent her final years bedridden in the living room. When nurses and carers visited they would ask about the pictures of her husband, their children, grandchildren and great grandchildren. She took great pleasure in recounting stories, and hearing theirs in return. Being in her own home preserved her independence and kept her spark alive.

Grandma was adamant that she wouldn't return to hospital – even if her life depended on it. Her resolve was mostly successful. Yet in this time before coronavirus, the NHS creaked under a weight of hospital admissions for sometimes routine reasons.

Many of these were preventable, says Dr Ben Maruthappu MBE, a former A&E practitioner who also had experience of having to organise care for a loved one. "I saw first-hand that older patients would come into a hospital because they weren't receiving the care they needed in their own home. They'd get unwell in a preventable way, for example if they had chest infections on a repeated basis," he tells BusinessCloud.

"Most traditional agencies run off pen, paper, whiteboards and snail mail. And if you're organising care for, let's say, your grandmother, you know when a carer is arriving, when they're leaving – and you've got very little information on what's happening. It makes it very difficult to coordinate care. Carers are also not well-paid in the sector, and that's partly because these companies and agencies are very inefficient, so they have to take much larger margins.

"I want to build a company that provides great care services by using technology to improve the experience of carers and users – while improving the scalability and the efficiencies of home care so that we can be more affordable while also investing more in our staff."

Dr Maruthappu launched Cera Care with Marek Sacha in 2016 and it has quickly grown into one

of the largest care companies in the country. Following the £30m+ acquisition of the Mears Group's care business – one of the companies which delivered care to my grandmother – it was delivering 10,000 visits a day before COVID-19 hit and holds 50 public sector contracts, including the NHS.

ALGORITHMS

The London firm's SmartCare algorithms can predict health deteriorations among the elderly population with 83 per cent accuracy, helping keep them in their homes for longer. It claims its Dynamic Tasks platform – a 'Google Maps for care' which uses AI to recommend actions to carers – works with 93 per cent accuracy. It may be the first company globally to use AI at scale in social care.



"We are collecting and analysing the data from care visits to predict if someone is at high risk of deteriorating," the entrepreneur explains. "A lot of older people have long-term health conditions and these can vary on a week-by-week or month-by-month basis. There will be subtle signs allowing you to identify if someone is getting worse: maybe they'll be a bit more drowsy, not be eating or drinking as much, going to the bathroom more often.

"Our systems are able to analyse these subtle changes and convert them into a risk [assessment] of someone becoming unwell. This



allows us to escalate care earlier on. It's really helpful to be on the front foot and nip issues in the bud."

Office staff can see the collected data on a risk dashboard and are immediately able to act on it, whether that means contacting a relative, their GP or 111. The software also helps match appropriate care workers to the person, based on their characteristics and experience, while Cera has partnered with IBM to test the use of sensors in the home to detect changes in care needs when carers are not present.

ACQUISITIONS

The Mears deal, which grew Cera's revenues to more than £30m overnight, followed £54m in fresh investment earmarked for driving a series

of acquisitions. "We were looking at a number of targets but we thought this acquisition would allow us to get a real national footprint across the UK," says Dr Maruthappu.

"We thought that our technology and our model of care could really make an impact into what was a traditional care provider - and better empower and support carers on the frontline. Fundamentally, it's about freeing up staff so they can focus more on caring than on paperwork."

In the early days Dr Maruthappu would perform tasks such as proofreading Cera's website as the founding team got things up and running. As Cera scaled he had to become more of a leader and call upon the experiences of a string of high-profile advisors, including former Standard Chartered Bank CEO Peter Sands.

"It's been an amazing journey. There's only one of me and we have 2,000 employees in this business, so building a system



Cera+

IN NUMBERS

Founded – 2016
Total funding – \$90m
Employees – 2,000
Daily visits – 10,000
Offices – 20

and culture where people can really succeed is so important – that’s definitely something I’ve learned along the way,” he says.

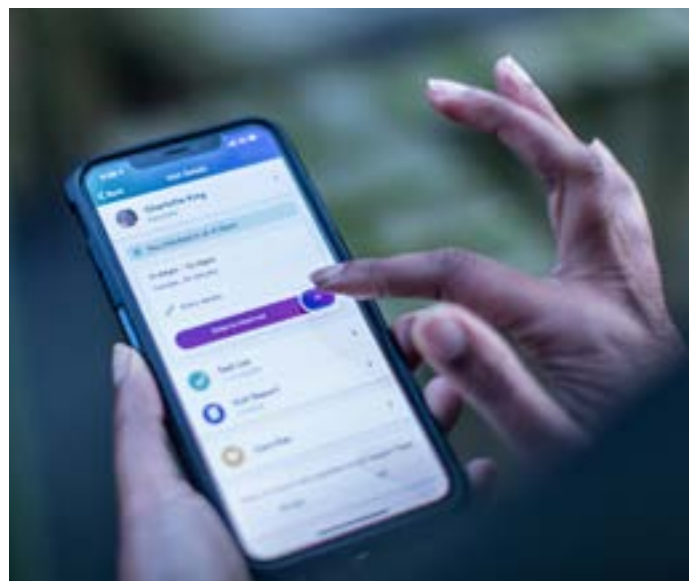
“Peter is one of our earliest investors and he’s really been a great mentor to me in establishing and growing Cera, as someone who understands both the health side and the impact we’re trying to make – but also the financial component too.”

Such has been Cera’s impact that Dr Maruthappu was recognised for his services to health and social care technology in the 2020 New Year Honours list. “It was amazing and humbling to receive an MBE. It wasn’t something I expected,” he reflects. “My mother was very happy – and I’m delighted as well!”

“It’s a great form of recognition for the team at Cera, who I think have worked tirelessly to bring about a new model of care and looking after people in this country.”

COVID-19

Companies such as Cera are more important than ever in keeping vulnerable people away from hospitals and safe during the COVID-19 pandemic. “Coronavirus caught many parts of this country and other countries off guard,” says Dr Maruthappu. “There are many more people who need care at home, as either they are discharged from hospital or to keep them well in their home. We saw it as a chance for us



to step up and for social care to have an even more important role in people’s lives, helping them to live well and independently during these challenging times.”

The firm created 10,000 roles as the pandemic took hold and offered to retrain airline staff made redundant or furloughed as a result of lockdown as care workers. “We saw an increase in the number of people who want to become carers as other parts of society started to dial down,” Dr Maruthappu adds. “People are looking for alternative sources of income, and they’re also looking for a way to help during this really important time for our country.”

BIG-NAME ADVISORS

Sir David Behan

Former CEO of the Care Quality Commission

Prof. Dame Carol Black

Chair, Nuffield Trust
Former President, Royal College of Physicians

Peter Sands

Former CEO, Standard Chartered Bank
Former Chairman, Davos

Prof. Thomas Zeltner

Chairman, KPT Health Insurance
Former Vice-Chair, World Health Organisation

Justin Jewitt

Former Chair, Hilton Nursing Partners
Former CEO, Nestor Healthcare Group

Mike Smith

Board Member, UK Homecare Association (UKHCA) CEO, Trinity Homecare

Samantha Jones

Former Director of New Care Models, NHS England

Delivering Digital Expertise

We are a **digital PR, training and communications agency** who support the application of **digital technology across health and social care.**

- Public engagement events, apps, social media, software solutions, video consultation
- Providing healthcare professionals with the confidence and support to use technology
- Digital up-skilling courses and digital champions
- On the ground support to practices
- Helping retain GPs and nurses through the use of technology
- Exploring and implementing the latest technologies



Get the best out of **Microsoft Teams**

Microsoft Teams offers greater control and self-service, promotes collaboration across practices and in networks, presenting opportunities to save time and resources through more productive working.

We can help you:

- Increase knowledge and utilisation of Microsoft Teams
- Improve workflow processes
- Increase digital literacy and confidence of your staff
- Capture best practice

We are helping to **transform Health and Social Care** through **Video Consultation**



Direct video consultation between the GP or nurse and patient



GP or nurse remote consultations to a care home, residential or hospice



Digital up-skilling programmes to support staff and patients



**Redmoor
Health**

E: hello@redmoorhealth.co.uk



@redmoorhealth

www.redmoorhealth.co.uk

100²⁰²⁰

HEALTHTECH

PIONEERS

The UK is a leading light in HealthTech thanks to its outstanding universities and a culture of innovation which spans the breadth of the nation. This ranking of the top 100 pioneering companies showcases a variety of technologies which are changing how we monitor our health; diagnose and treat illnesses; improve services for patients; and transform a creaking NHS. It was compiled from a combination of reader votes and an independent judging panel.

Many thanks to the judges, listed below.

- Corby Ganesh, portfolio director, HETT
- Abeyna Bubbers-Jones, CEO, Medic Footprints
- Nick Prentice, global community support, One HealthTech
- Lauren Bevan, head of health & social care, BJSS
- Jonathan Symcox, editor, BusinessCloud

01. TOUCH SURGERY

London-based Digital Surgery is the firm behind the Touch Surgery platform which provides surgical simulation training inside its app or in VR. The company plans to introduce machine learning tools into operating theatres to assist surgeons and make surgery safer.



02 DR JULIAN

Also based in London, Dr Julian is an app which connects people suffering from poor mental health with therapists. Aiming to put accessible and affordable mental healthcare into the hands of everybody, its tech-connected offering is available both on the NHS and to employees of corporate companies.



03 BABY2BODY

An app providing personalised coaching in health and wellbeing, London-based Baby2Body is focused on women going through pregnancy and motherhood. Described as 'your best friend in your back pocket', it advises on how to stay fit, eat well and live more mindfully.



04 HY-GENIE

See full profile below.

05 ACCURX

A free text-messaging service that connects GPs with patients. The London company's flagship product, Chain SMS, is used by more than a third of GP practices in the UK to communicate with their patients. The firm's focus is on learning and developing ideas for powering communication across the healthcare workforce.

06 ORCHA

A Daresbury-based firm used by governments and health and social care organisations to evaluate the more than 325,000 available healthcare apps. ORCHA conducts reviews for NHS Digital and NHS England is accelerating the uptake of its service across the NHS. Many of the app-based businesses on this ranking cite their ORCHA rating as validation of their product.

07 ZESTY

Zesty is a healthcare patient engagement platform. Based in London and recently acquired on a conditional basis by listed HealthTech Induction Healthcare, it allows patients to manage their hospital outpatient appointments, read their administrative and clinical correspondence, attend a video-based consultation and store a personal copy of their clinical record.

08 ANDIAMO



Hackney-based Andiamo was founded by Samiya and Naveed Parvez to fast-track the process of designing and manufacturing custom-made splints and braces to support the spine and limbs of disabled children. Their motivation was the suffering endured by their tragic son Diamo, who suffered unimaginable pain before dying from complications

associated with his cerebral palsy at just nine years of age. They now hope to help millions of others.

09 ADAPTTECH

Adapttech has developed a technology that helps improve how prosthetic legs are fitted. The Birmingham business' INSIGHT system combines laser scanning, wearable technology and a mobile app to make it faster and easier to correctly fit lower-limb prostheses and monitor a patient's entire rehabilitation process.

10 ELECTROSPINNING COMPANY

Established in 2010 as a spin-out by the UK Science and Technology Research Council (STFC), the Electrospinning Company is based at the Harwell Science and Innovation Campus in Didcot near Oxford. It helps design, develop and manufacture biomaterials products to be implanted into human body.

04 HY-GENIE



+44 (0)151 318 0761
info@hygenie.io
www.hygenie.io
@Hy_genie_io

Hy-genie is a product developed by Hand Hygiene Solutions Limited, a collaborative venture between Nova, a Liverpool-based start-up consultancy, and Deepbridge Capital.

It was founded by Dr Richard Cooke, who has been working as a 'Medical Founder' in the Innovation department at Alder Hey since his retirement in 2017. He previously worked at Alder Hey as a Consultant Medical Microbiologist and was the Trust's Director of Infection Prevention and Control.

The product is an innovative automated hand hygiene monitoring system that measures the usage, in real time, of hand hygiene stations within the hospital setting. This data can then be plotted and displayed against base metrics to further improve staff hand hygiene compliance.

The Hy-genie system is designed to integrate into existing hospital workflows, with minimal interruption to healthcare service. This lowers the barriers to adoption.

The data collected on an individual's performance is only viewable by that individual, allowing healthcare workers to take ownership of their personal hand hygiene performance without concern of being closely monitored.

Members of the hospital Infection Prevention and Control (IPC) teams and management are able to view aggregated data at a ward/department/role level, in order to make targeted decisions on hand hygiene improvements in their hospitals.

In response to the COVID-19 pandemic the team have developed Hy-genie Lite, a scaled-back version of the full system to allow for rapid installation into healthcare settings.

11 DOCTIFY

Doctify enables patients to search, book and review clinics and hospitals online. Based in London, the comparison app includes dentists and aims to empower people to make informed decisions.

12 3D LIFEPRINTS



Liverpool start-up 3D LifePrints makes silicon body parts for the medical profession. It aims to make these affordable and efficient for hospitals to obtain through the provision of a service package of hardware, software and staffing. It is looking to open hubs throughout the UK, Europe and worldwide.

13 LANTUM

London company Lantum enables health workers to find locum shifts and says its mission is to help save the NHS £1bn in staffing costs. Used by 2,000 healthcare organisations and 20,000 clinicians, more than five million patients have been seen by Lantum doctors.

14 AQUARATE

See full profile below.

15 PATCHWORK

Founded by NHS doctors Anas Nader and Jing Ouyang in 2016, Patchwork aims to support hospitals in filling vacant shifts with existing staff, cutting agency spending. The London start-up, which also has offices in Manchester and Liverpool, has partnerships with NHS Trusts and plans to also move into the private sector.

16 SKY MEDICAL TECHNOLOGY

Daresbury's Sky Medical Technology is the parent company of firstkind, which has developed the geko wearable device and accompanying OnPulse platform. Resembling a wristwatch and worn on the lower part of the leg, this stimulates improved blood flow for wound healing, treatment of oedema and prevention of deep vein thrombosis. It has also potentially helped save lives by reducing the risk of blood clots in COVID-19 patients.

17 ELVIE



Leading FemTech firm behind the Elvie Trainer, an award-winning app-connected Kegel trainer that helps women strengthen their pelvic

04 AQUARATE



Aquarate believes that people who need healthcare can live life to the fullest, for longer.

In the UK alone, up to 40,000 people die of preventable hydration-related illnesses such as Acute Kidney Injury (AKI) each year. Yet research shows that ineffective, inaccurate, manual fluid balance charts are still in use. This is where Aquarate will make a difference.

We craft innovative healthcare solutions to ensure effective hydration for the people that need it most. Our first innovation, the AQi System, is an intelligent service that tracks patients' daily fluid consumption and is designed to work behind the scenes in hospitals, care homes and assisted living environments.

Aquarate helps people achieve their recommended daily fluid intake by monitoring how much they've had to drink. Our technology sends friendly reminders, motivating you to maintain healthy hydration levels in order to reduce infection and cognitive impairment from preventable dehydration-related illnesses.

In 2017, smart hydration monitoring was just an idea in a pool of many other opportunities. Since then we have relentlessly tested new technologies, observing users of our prototypes to find the right solution. So far, the response from healthcare professionals has been beyond expectation! Our technology integrates directly into electronic patient records, allowing care staff to proactively manage fluids.

The smart cups will be coming to market in 2020. For more information on how your organisation can pilot our system first hand, please get in touch.



+44 (0)7827435754
rebecca@aquarate.com
www.aquarate.com



@AQUARATE

floor. The London company's second product, the Elvie Pump, is the world's first silent wearable breast pump.

18 SENSYNE HEALTH

Oxford firm Sensyne Health is accelerating the discovery and development of new medicines. The listed company uses artificial intelligence to develop software that connects patients, clinicians and researchers and works with several NHS Trusts.

19 UMED

uMed enables healthcare providers to deliver cutting-edge research to their patients. Based in London, it links real-time health record data to scalable and compliant patient engagement across an international network of healthcare providers.

20 HERO WELLBEING

See full profile below.

21 BENEVOLENT AI

London's Benevolent AI applies artificial intelligence, machine learning and other advanced technologies to reinvent the ways drugs are discovered and developed. Its mission is to deliver life-changing medicines for patients suffering from the thousands of diseases that have no treatment through analysing large scientific research data sets.

22 INOTEC



Based in Cambridge, Inotec is behind the Natrox device which heals and treats complex chronic wounds with pure humidified oxygen. The business currently provides products to the NHS and health providers in key markets including the US, Italy, Southeast Asia and the Middle East.

23 KHEIRON MEDICAL TECHNOLOGIES

By harnessing the power of artificial intelligence in its screening software Mia, Kheiron Medical Technologies is seeking to enable earlier detection of breast cancer. After breast screening services were paused as a result of COVID-19, the London firm won an Innovate UK grant for a six-month clinical evaluation of Mia to determine how best to automate screening services and tackle the backlog.

24 CLINSPEC DX

Brain tumours are difficult to detect, meaning that patients often receive their diagnoses far too late. Glasgow-based ClinSpec Dx is behind an AI-enabled spectroscopic liquid biopsy test which could help detect these patients earlier. The blood analysis tech could also be useful for early and cost-effective detection of other cancers and diseases.

20 HERO WELLBEING



hero was formed to have a positive influence on individuals, organisations and communities by supporting all types of healthy behaviour.

Supporting organisations in proactively looking after their employees is the driving force behind one of the most comprehensive health and wellbeing platforms on the market today.

Now established as the 'go to' provider of wellness solutions, hero's award-winning Navigator web and app platform offers a wide variety of company-wide tools and insights. Individuals can track habits; engage in programmes and challenges; gain access to comprehensive education; and access personalised health improvement strategies with the support of trained and qualified specialists across physical and mental health.

When we feel healthy, something magic happens: we are more confident, self-assured and have a positive mindset. We are also more giving and open to helping others. Healthy and highly-engaged employees are, on average, up to 30 days more productive and organisations promoting health and wellbeing are 3.5 times more likely to be creative and innovative.

By using Navigator, organisations can expect to see higher participation and engagement rates by using a more personalised and varied approach, focusing on every aspect of health from mindfulness, sleep, nutrition, activity and health goals based on personal objectives.

hero's Navigator platform allows this activity to be measured, bench-marked and valued. The ability to personalise health and wellbeing is vital: organisations which recognise this will be the true winners.

www.herowellbeing.com/contact/
@herowellbeing

25 B-SECUR

Belfast-based biometrics company B-Secur has developed a monitoring tech capable of identifying an individual from their unique heartbeat. Heartkey can detect fatigue several minutes before it becomes dangerous, which could be huge in the fields of cyber security and health.

26 BIOS

BIOS is developing a neural interface platform to decode and encode the signals from the brain to the body. The Cambridge firm, which has an R&D base in Canada, envisages a future where patients' chronic conditions are managed via the nervous system in a personalised fashion by AI - replacing drugs and changing the lives of millions of people.

27 THINKSONO



ThinkSono's aim is to allow any healthcare professional, including nurses, to use ultrasound to assess and diagnose a multitude of problems. Based in London, its first product, AutoDVT, can detect potentially deadly deep vein thrombosis in under 10 minutes. This could also be vital in saving lives in rural areas and developing countries which lack access to advanced technology.

28 VINE HEALTH

London's Vine Health helps cancer patients. It tracks medication-taking, symptoms and lifestyle, allowing people to feel more in control of their treatments and the corresponding side effects. The platform also collects large-scale data on how particular

drugs affect patients' quality of life, creating evidence for the development of new treatments.

29 PERSPECTUM DIAGNOSTICS

Oxford-based Perspectum Diagnostics provides non-invasive technology for identifying and monitoring multiple diseases. Its first diagnostic product, LiverMultiScan, uses software to extract quantitative data from current MRI scans to aid with the detection of chronic liver disease.

30 ADVANCED DIGITAL INSTITUTE

The digital health products of Saltaire-headquartered Advanced Digital Institute include MyPathway communication software which has delivered more than 500,000 health and care communications to NHS patients since 2017. These include referral and appointment information, healthcare questionnaires, service information messages, signposting to support resources and self-management goal reminders.

31 SUREPULSE

University of Nottingham spinout SurePulse is behind a wireless heart rate monitor for newborn babies and goes by the mantra 'every second counts'. Many existing solutions are not suitable for newborns which can sometimes mean clinicians do not have the information they need to manage the baby's care optimally.

32 HEALTHUNLOCKED

The 'world's largest social network for health', London-based HealthUnlocked has more than a million members across the globe. It connects people with the same health conditions, allowing them to share experiences and get answers to questions about their chronic conditions and wellbeing needs.

33 PANDO HEALTH

Pando, formerly Forward Health, provides free technology for secure communication between NHS staff - reducing their reliance on bleeps, switchboard and WhatsApp. Based in London, the platform is used in more than 200 hospitals and has more than 45,000 users.

34 RESCAPE INNOVATION



Based in Cardiff, Rescape Innovation works to develop virtual reality products that help patients deal with pain, rehabilitation, stress and anxiety by distracting the brain. The technology allows the patient to be immersed in a different reality, helping the brain to reduce pain and ease the feelings of anxiety.

35 MOODBEAM

Hull-based HealthTech start-up Moodbeam has developed a wearable device which monitors emotional wellbeing. The connected bracelet allows users to track their mood and identify the triggers and patterns that define it at a particular moment.

36 PHOREMOST

PhoreMost is behind a SITESEEKER phenotypic screening platform which is aiming to drug 'undruggable' disease targets. This has the potential to significantly increase the diversity of novel therapeutics for cancer and other unmet diseases.

37 XPLORO

See full profile below.

38 MEDIC CREATIONS

Newport-based Medic Creations' core product is Medic Bleep, a secure patient-focused solution to the communication challenges that healthcare professionals face while going about their everyday work. Features include group text and audio messaging, audio calls, file sharing and reporting tools.

39 OPTELLUM

Optellum was founded so that every lung cancer patient is diagnosed and treated at the earliest possible stage - and cured. Based in Oxford, its AI-enabled clinical decision support software consults the world's largest clinical data set and identifies at-risk patients while expediting optimal therapies.

40 THRIVA



London-based Thriva is behind fingertip blood tests which can be carried out at home and analyse for indicators of heart disease and diabetes as well as vitamins, minerals and hormone function. Designed to help customers with different conditions understand and improve their health, it is launching personalised health plans and supplements as it scales up partnerships with healthcare providers.

41 OPEN BIONICS

Open Bionics has created low-cost 3D-printed bionic arms. The 'Hero Arm' can be used by children as young as nine and is controlled via sensors that detect and respond to movement in the upper arm muscles. The Bristol firm enjoys licences with Disney, Marvel and

Pixar to accessorise its prosthetics with superhero characters.

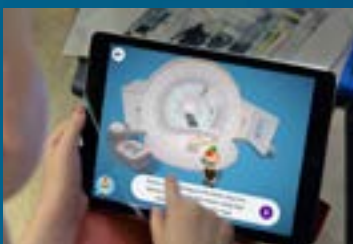
42 PHARMACY2U

Before COVID-19 Leeds-headquartered Pharmacy2U dispensed repeat prescriptions to a quarter of a million NHS and private patients every month. Robots in its fulfilment centre pick 60 per cent of its dispatches and assist with the rest. In October it will open a second facility in Leicester which will ultimately increase its capacity to seven million items of drug per month.

43 ACURABLE

Acurable is the commercial company behind the AcuPebble sensor, a wearable device capable of accurately diagnosing and managing respiratory conditions at home. The product of a decade of research at Imperial College London, it claims to give readings which are five times more accurate than current solutions.

37 XPLORO



+44 (0)161 838 0808
info@xploro.health
www.xploro.health/
@xploro_health

Xploro is a clinically proven digital therapeutics application which uses augmented reality, gameplay and artificial intelligence to deliver health information to young patients, reducing the anxiety associated with hospitalisation, improving health literacy and fostering better engagement with health services.

Xploro consists of a mobile application for patients, a web application for parents and a management portal for clinicians. The Xploro mobile app uses 3D augmented reality interactive models, an artificially intelligent avatar guide and a series of multi-player games to introduce patients to hospital environments, staff and processes.

Our management system allows clinicians to gather invaluable patient-reported outcomes and experiences from their patients.

By putting health information in the hands of children, using language they understand and interaction paradigms they are familiar with, Xploro aims to reduce their anxiety and improve their clinical outcomes.

By reducing the fear associated with procedures Xploro aims to reduce repeat procedures and shorten treatment times. By encouraging patients to keep a mood diary Xploro aims to gather meaningful feedback for clinicians.

Finally, by improving child health literacy Xploro provides the foundations for a generation of patients better able to self-manage their healthcare.

We're starting with children with cancer - but we're building a health information platform for any patient, any age, any condition, anywhere.

44 **FEMEDA**

Headquartered in London with manufacturing and operations in Northumberland, Femeda develops medical devices to combat female urinary incontinence. Its Pelviva product is a disposable intra-vaginal device containing a microprocessor which delivers pulse technology to the pelvic floor muscles, causing them to contract.

45 **OXFORD GENETICS**

Oxford Genetics, now trading under the name OXGENE, accelerates the discovery and development of cell and gene therapies. Its automated CRISPR platform discovers antibodies against previously intractable membrane proteins.

46 **UNMIND**



Unmind's digital solution empowers employees to take a proactive and preventative approach to mental health and wellbeing. The London firm is now supporting more than 350,000 people in more than 50 countries with tools to help with sleep and nutrition plus work and life stressors.

47 **BABYLON HEALTH**

London unicorn Babylon Health provides digital-based healthcare, which includes access to a doctor via video chat, prescription deliveries and health checks. Offering thousands of remote consultations each day, covering millions of users, the firm also has a chatbot 'virtual doctor'.

48 **BIRDIE**

Homecare management tech provider Birdie is aiming to improve the lives of a million older adults within five years. Thousands of carers now work with Birdie's solution to drive the standards of care up by being more transparent, person-centred and proactive in the management of client health and wellbeing.

49 **UMOTIF**

Since 2012 the uMotif platform has captured data generated in clinical trials to support new insights. The London company powers some of the largest virtual trials around the world and its tech is used by leading academics, BioTechs, medical device firms and pharmaceutical companies.

50 **DOC ABODE**

A provider of workforce software for the healthcare sector, Bradford-based Doc Abode is developing algorithms which match capacity to demand and create a safer and more responsive care system. By harnessing digital technologies, it aims to boost adaptability within the workforce through a flexible talent mix and new ways of working.

51 **ZAVA**



A discreet prescription medication service, digital doctor Zava can assess around 35 symptoms from flu-like infections, headaches or sleeping problems to gastrointestinal disorders. The London firm also refers patients who cannot be treated remotely to a local doctor and has delivered four million treatments to date.

52 **ZENTRAXA**

Spun out of the University of Bristol, BioTech Zentraxa is commercialising Zentide, a manufacturing process to produce biological adhesives for use in sectors including healthcare.

53 **IESO DIGITAL HEALTH**

Ieso Digital Health provides one-to-one cognitive behavioural therapy online on behalf of the NHS and some of North America's biggest healthcare providers. The Cambridge company also uses AI to assist therapists treating patients who suffer from mental health conditions.

54 **SUTRUE LIMITED**

Colchester's Suttrue has developed an automatic stitching device for safer, better medical and veterinary stitching. By enclosing the suture needle in a cartridge, its devices minimise the risk of accidental puncture of the skin and protect healthcare workers from HIV, hepatitis and other blood-borne viruses.

55 **STEEPER GROUP**



A Leeds company celebrating its centenary in 2021, Steeper started out creating prosthetics for veterans of World War I. Now led by founder Hugh Steeper's grandson Paul, its products today include upper extremity prosthetics alongside a tech platform.

56 ZOOMDOC

With a network of more than 500 GPs across the UK, ZoomDoc's on-demand service allows instant worldwide video consultations. The London firm also provides instant prescriptions and continued care with referrals to private specialists and hospitals.

57 CMR SURGICAL

Cambridge firm CMR Surgical is among the fastest-growing businesses in the UK and has offices on four continents. Versius, its surgical robot and first product, is a 'biomimicking' arm for surgeons which can help to perform minimal access surgery.

58 PUSH DOCTOR

Manchester-based online GP service Push Doctor has a reach of more than a million people and is aiming for its technology to be in 75 per cent of the country's GP surgeries inside five years. Its appointments are 10 minutes long and available privately or for free when booked through NHS partnerships.

59 C THE SIGNS

A digital tool combining AI and evidence to help GPs identify cancer early, C the Signs supports GPs to identify patients at risk of cancer at the earliest and most curable stage of the disease. It is currently being used in the NHS.

60 C7 HEALTH

Based in Henley-In-Arden, Warwickshire, C7 Health's technology helps clinicians deliver better care to their patients. These include electronic referral, scheduling and workflow management software.

61 EYOTO



Eyoto originated as a spinout from Aston University's School of Optometry and is tackling problems facing the optical industry. It is now developing a range of hardware and software products incorporating recent advances in artificial intelligence, low-cost optics and mobile processing power.

62 ARETE MEDICAL TECHNOLOGIES

Cambridge-based Arete Medical Technologies develops hardware and software to help with chronic respiratory diseases, which reduce the quality of life of millions of people worldwide and are a major cause of death. Decreasing sensor costs, artificial intelligence and biomechanical modelling allow for precise, personalised and preventative management.

63 ARTHRONICA

Arthronica is a digital HealthTech start-up focused on chronic arthritic conditions. The London firm uses computer vision to support doctors in diagnosis, monitoring, treatment and rehabilitation, with the goal of offering remote care across the world.

64 METIX

Glasgow's Metix has developed a portable device, Coremed, which it pairs with a remote dashboard to improve patient monitoring. Its analytics help clinicians make informed decisions that will improve patient treatment, triaging and reporting.

65 SPILL

London-based Spill, a therapy app to improve workplace wellbeing, starts by asking four questions through communication platform Slack. Through this it spots which employees need extra emotional support and allows them to book video sessions with qualified therapists, browse tools or access content.

66 CONGENICA

Congenica aims to convert genomic data into actionable information. The Cambridge firm's automated software platform can analyse the entire human genome to identify a problem and interpret the details via trillions of data points.



67 EXSEED

The exseed home sperm test turns a smartphone into a powerful microscope that lets users test and track semen quality in the privacy of their own home. Based in London, it also provides a personalised lifestyle programme to improve the quality of sperm and increase fertility.

68 AXIAL3D

Belfast-based axial3D gives clinicians access to patient-specific 3D-printed models. It aims to make 3D printing accessible throughout the healthcare sector through innovative software and services.

69 HEALX

Cambridge's Healx aims to improve the lives of rare disease patients by utilising AI to accelerate the discovery and development of treatments. Its Healnet platform claims to move clinical trials for new treatments 80 per cent faster, 80-90 per cent cheaper and with a greater chance of success than conventional drug discovery methods.

70 BIOBEATS

London firm BioBeats has developed a wearable device to collect biometric data – such as sleep cycles, heart rate and physical activity – alongside psychological and neurological data, psychometric tests and questionnaires. This is connected with an app, BioBase, which allows users to keep track of their mental and physical health and make suggestions on how they can improve wellbeing – or even refer them to therapy.

71 HUMA

Acquisitive Huma, rebranded recently from Medopad, produces applications that integrate health data from existing hospital databases as well as patient wearables and other mobile devices. The London firm securely transmits this for use by doctors and also uses AI to predict conditions.



72 ROUTE KONNECT

Route Konnect has developed Internet of Things sensor networks to track real-time traffic and congestion. Based in Cardiff, its solution improves response times for emergency services.

73 ALLERGY THERAPEUTICS

Based in Worthing, Allergy Therapeutics is an immunology business with specialist experience in the research and development of allergy treatments. Aiming to treat the cause rather than managing symptoms, its technologies are added to vaccines to advance results and drive beneficial immune responses in cancer and infectious disease.

74 MYCOGNITION

London's MyCognition is dedicated to understanding and improving cognition. Taking a research-based approach has resulted in has an NHS-approved platform that allows a user to comprehensively track, change and consolidate their cognitive health, strengthening their health and mental resilience.

75 REFEYN

Spun out of the University of Oxford's chemistry department, Refeyn was founded to commercialise mass photometry. A new technology application in molecular mass measurement, it effectively weighs biomolecules using light.

76 CERA CARE

London-based Cera claims its SmartCare algorithms can predict health deteriorations among the elderly population and keep them in their homes for longer. The firm has 50 public sector contracts, including with the NHS, and has partnered with IBM to test the use of sensors in the home to detect changes in care needs when carers aren't there.

Cera+

77 PERFECT WARD



A smart document analyser for healthcare inspections, the Perfect Ward app helps staff spend less time doing admin and frees them up to care for patients. The London firm's tech is usable across all clinical areas, including wards, theatres, care homes and community and social care.

78 BIOSIGNATURES

Biosignatures is a Newcastle start-up marrying cutting-edge blood testing with machine learning software to diagnose disease early. It is hoped that the disease-specific clinical diagnostic tests it is developing will be performed on one blood sample and be targeted at cancers and dementia.

79 INDUCTION HEALTHCARE

Listed HealthTech Induction, headquartered in London, has two platforms. The Induction app helps more than 140,000 users – mostly doctors – to securely share phone numbers and bleeps, bookmarks, documents and messages in a clinical setting; while the MicroGuide app, used across approximately 75% of NHS trusts, has 173,000 users.

80 DOCTORLINK

A platform using automation to triage and redirect GP appointments, London's Doctorlink is preparing for further growth after coronavirus accelerated its uptake. Through messaging and video and phone consultations provided to a patient's own NHS GP, the firm claims that it was reducing call volumes by a third even before coronavirus.

31 NOURISHED



Based in Birmingham, Nourished 3D-prints customised vitamin supplements. Created by piping a sugar-free vegan formula into a chewable sweet, the seven layers are personalised from a possible 28 vitamin and supplement options after users complete a lifestyle questionnaire.

32 EXSCIENTIA

Oxford-based Exscientia is aiming to transform the economics and productivity of drug discovery. Collaborating with some of the world's largest blue chip pharma companies, it applies AI to the wealth of published literature to achieve a far greater understanding of targets than any individual experiment.

33 EMIS HEALTH



EMIS Health provides electronic patient record systems and software to primary care, community pharmacies, hospices, specialist services and secondary and community care. Based in Leeds for 30 years, its technology today is used by more than 10,000 organisations.

34 OXFORD NANOPORE TECHNOLOGIES

Unicorn Oxford Nanopore has developed a real-time DNA/RNA sequencer and can assist with accurate, rapid testing in cancer and infectious disease. Its devices are being used in scientific research worldwide and also playing an extensive role in research around COVID-19.



35 CLOSED LOOP MEDICINE

Digital therapeutics start-up Closed Loop Medicine's software generates data and insights about how a patient is responding to treatment. The Cambridge firm can help them tailor drug and non-drug therapy to prevent, manage, or treat a medical disorder or disease.

36 NANNA THERAPEUTICS

Cambridge firm Nanna Therapeutics is developing novel drugs to address age-related diseases. These include mitochondrial, neurodegenerative, cardiovascular/metabolic, joint/tissue disease as well as cancer.

37 ONCIMMUNE HOLDINGS

Oncimmune Holdings is a Nottingham-based immunodiagnosics group which is driving commercial adoption of its product EarlyCDT Lung, a CDT test that measures the levels of seven autoantibodies to tumour-associated antigens. It claims to detect all types of lung cancer at all stages of disease with high accuracy.

38 BOND DIGITAL HEALTH

Based in Cardiff, Bond Digital Health has strategic partnerships with life sciences and medical device innovators to create digitally connected lateral flow diagnostics. These data tools provide an elevated user experience and enable enhanced real-time decision-making.

39 ELUCID MHEALTH

eLucid mHealth is behind the Pill Connect smart medicine dispenser. The Manchester company's product allows for remote monitoring of each dose in real-time and supports adherence with digital dispensing controlled by their schedule.



40 PREDICTIMMUNE

PredictImmune develops pioneering tools for guiding treatment options in immune-mediated inflammatory diseases like Crohn's and ulcerative colitis (IBD). Based on 10 years of research at Cambridge University, its test kits help both clinicians and patients to understand, at the point of diagnosis, the likely course of disease and opens the possibility of better treatment choices from the outset.



91 FUNDAMENTALVR

London firm FundamentalVR is behind education platform Fundamental Surgery, a virtual reality software system which uses haptic feedback to simulate how surgery feels. Its measurable and repeatable scenarios allow training surgeons to refine their skill.

92 E-THERAPEUTICS

Listed Oxford company e-Therapeutics has created a computer-based approach to drug discovery. Its proprietary technologies are Network-driven Drug Discovery, which is based on network science, statistics and machine learning; and Genome Associated Interaction Networks, a novel approach to functional genomics.

93 ORCHARD THERAPEUTICS

Orchard Therapeutics is developing potential cures for rare and often-fatal diseases. Headquartered in London, its ex vivo gene therapy technology is designed to use a person's own blood stem cells and insert into those cells a working copy of the missing or faulty gene - with the aim of permanently correcting genetic disorders with a single treatment.

94 CLIN-E-CAL



Manchester University spinout Clin-e-cal is behind interactive games to help young children with their inhalers and spacers. Its apps are underpinned by Sound Response technology.

95 BIOFIDELITY

Biofidelity is a Cambridge company identifying low-frequency genetic mutations in DNA to enable earlier detection of disease and better targeting of treatments. Applications for its molecular diagnostic assay span oncology, pre-natal testing, infectious disease and organ transplant monitoring.

96 ELDER

The My Elder app provides live-in care for the elderly and matches self-employed carers to families in need using algorithms. The London firm claims to be able to find a carer anywhere in the UK within 48 hours and says it adds the equivalent capacity of a care home to the market every 12 days.

97. FEEDBACK MEDICAL

Feedback Medical has developed medical imaging tech. The Cambridge firm's products are used by radiologists, clinicians and medical researchers to research diseases, particularly cancer.

98. BICYCLE THERAPEUTICS

Bicycle Therapeutics is developing a new class of small, chemically synthesised medicines called Bicycles. Headquartered in Cambridge with a base in Massachusetts, its clinical stage BioTech is targeting diseases that are underserved by existing therapeutics.

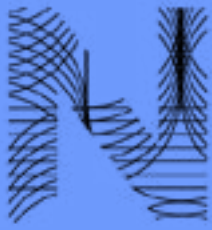
99 ENDOSCOPE-I

The endoscope-i is a smartphone attachment allowing doctors to take pictures of the inner ear or throat. Alongside an accompanying app, the Birmingham firm claims to reduce hospital visits and improve diagnosis time.

100 HOWZ

A smart home monitoring system for the elderly, Howz uses a combination of software and hardware – including movement sensors – to build up a pattern of daily behaviour and alert families if anything is out of the ordinary. The Manchester firm is working with EDF Energy on the tech.





NOVA

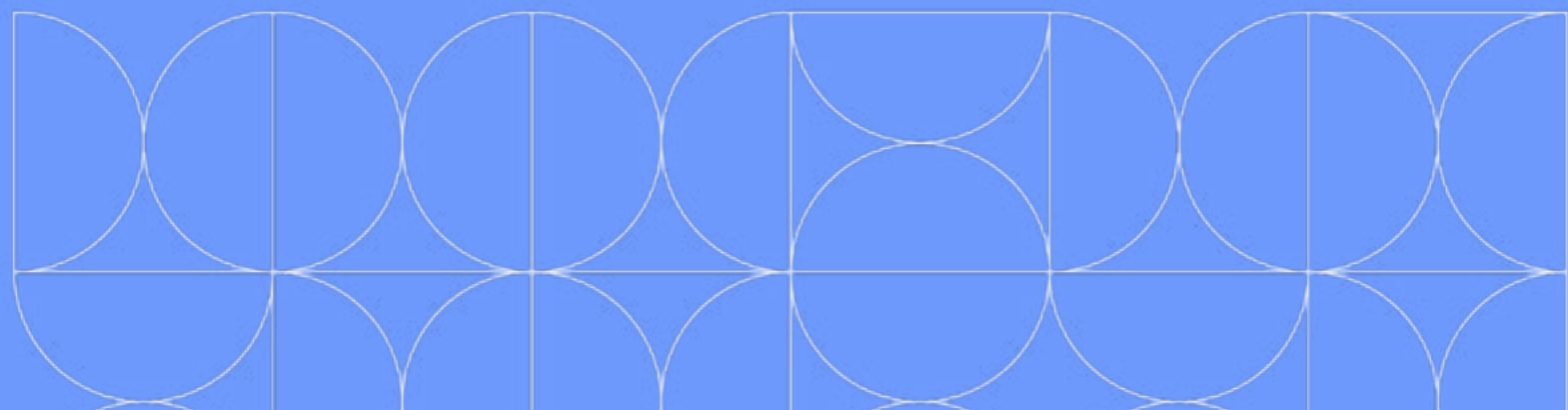
@wearenovauk

wearenova.co.uk

0151 558 1989

Fundamentally changing the way
startups are *founded, funded* and
scaled.

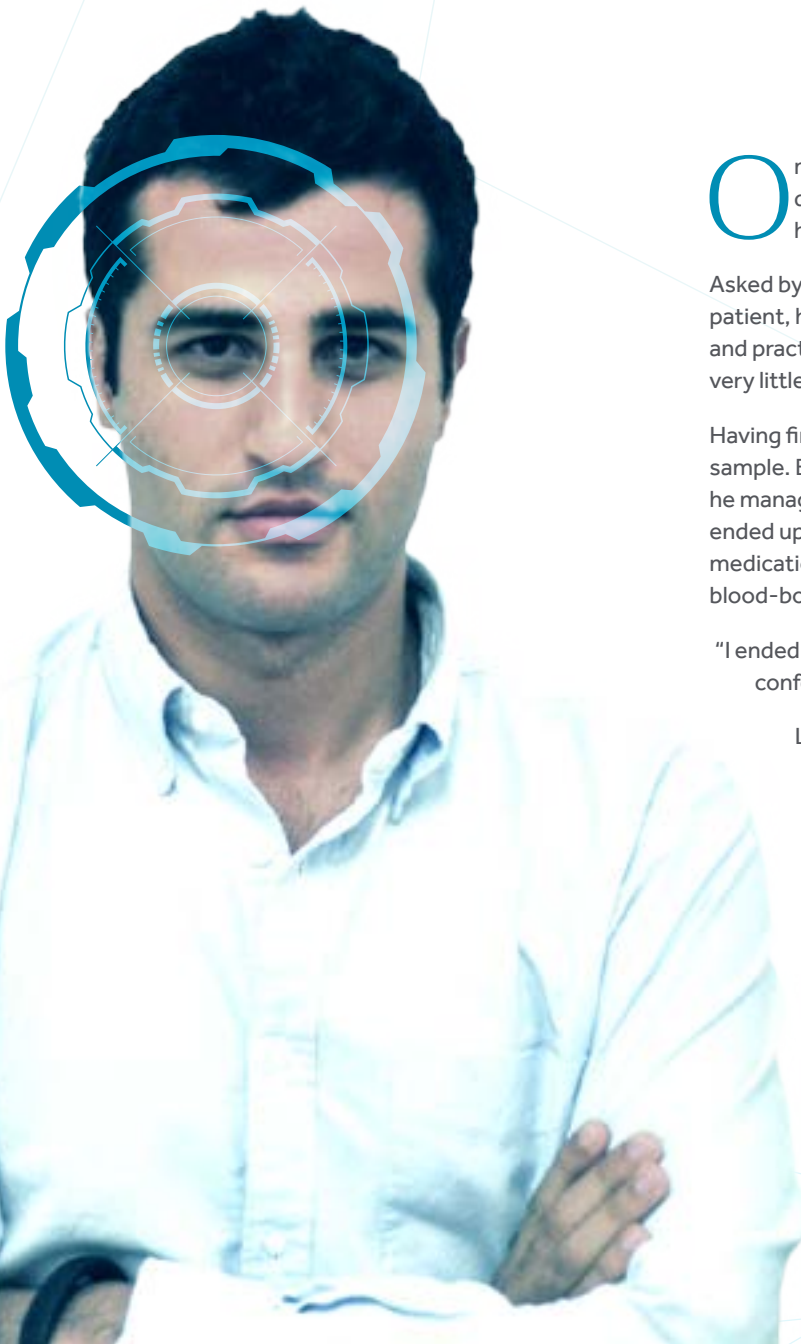
Mentorship • Investment • Team



A CUT ABOVE THE REST

TOUCH SURGERY, WINNER OF OUR 100 HEALTHTECH PIONEERS RANKING, IS MAKING PROCEDURES SAFER FOR MILLIONS – AND READYING MACHINE LEARNING TO REDEFINE PRECISION IN THE OPERATING THEATRE

Words: Alistair Hardaker



On Jean Nehme's first day as a junior doctor, he made a mistake which could have had disastrous consequences.

Asked by a senior to take blood from a high risk patient, he realised that years of passing exams and practising on mannequins suddenly meant very little: for Nehme was petrified of blood.

Having finally found a vein, he managed to take the sample. But in transferring it to the storage vessel, he managed to stab himself with the needle – and ended up in the emergency department taking medications to prevent himself from contracting blood-borne conditions.

"I ended up doing worse things with scalpels," he confesses to BusinessCloud.

Londoner Nehme says studying to become a surgeon was a rewarding experience but did not prepare him for the transition to practice. "There's a lot of theory, and turning that theory into practical knowledge is the challenge," he says.

When it comes to operations, this practical knowledge was carried out under the maxim 'see one, do one, teach one', he recalls, but he felt that 'seeing one' wasn't enough: "You should see hundreds."

INTERVIEW

It is believed that diseases requiring surgical procedures cause more deaths worldwide than HIV/AIDS, TB and Malaria combined.

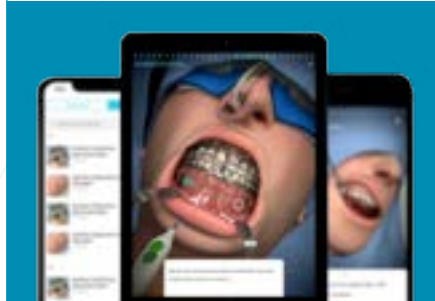
Against this backdrop, in 2013 he and fellow doctor Andre Chow founded Digital Surgery. Its Touch Surgery platform offers access to immersive, interactive surgical simulations and videos which doctors can use to learn, rehearse and test for their next procedure. Nehme says it is now being used by millions.

The web platform and mobile app includes instructions for around 200 surgical procedures in 17 specialities (see boxout on opposite page). For example, a 'basic lumbar puncture' is listed under anaesthetics, COVID-19 and emergency medicine.

MILESTONES

It is a world away from the meagre resources Nehme and his peers were once accustomed to. "I used to go into a hospital and I'd have my phone – this little computer on which I could search for anything and order food – but inside the hospital I'd be taking out a pager and would have to fax requests," he recalls. Among the entrepreneur's significant milestones

are raising more than \$90m in investment – among the largest amounts for a HealthTech globally –



and its acquisition in February of this year by US-based medical technology company Medtronic. Nehme wouldn't reveal the size of the deal, but says it was significant.

Still based in London, the growing team is now building tech which has moved from the lecture hall to the operating theatre. Its surgical video storage and analytics platform, Touch Surgery Professional, is a secure place for the recording and playback of surgeries. It offers a chance to review surgery performance, annotate and share with others.

But Nehme says the third arm of the business is the one he is most excited about: artificial intelligence and robotics. While there are already keyhole surgery machines in the operating theatre which could be considered robotic, he says they "aren't intelligent, smart robotic systems – they are still controlled by surgeons".

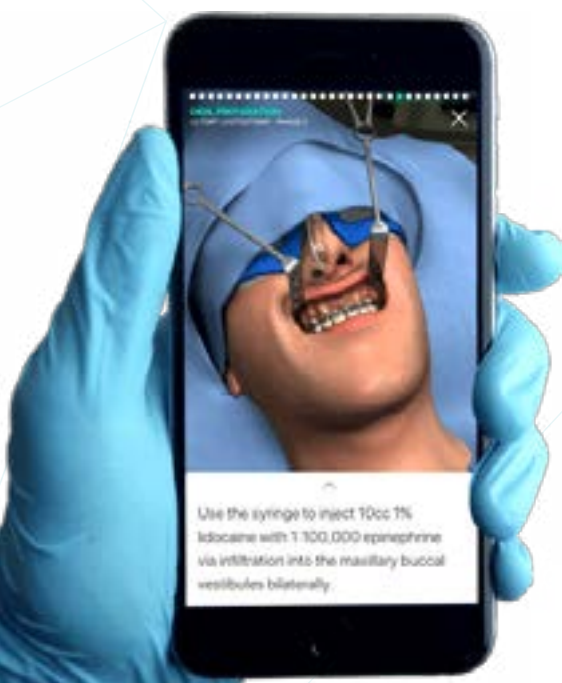
That could change within five years, he predicts. "What we demonstrated just over two years ago was that we could bring a computer into the operating room. With the same type of technology that is in self-driving cars, we trained a computer to understand the surgical process so it can predict the surgeon's next step."

Using that autonomous vehicle analogy, he says you first need a map, then journey planning – in this case surgery and procedures – before

integrating the technology into cars (theatres) to assist drivers (surgeons). Digital Surgery's technology is not designed to replace the person behind the wheel, but to keep people as safe as possible.

RED TAPE

The health sector is often slow to adopt cutting-edge tech for fear of errors and red tape, a bridge which Nehme says is a "hard one to cross". However he argues that risk aversion is in fact the core benefit of the firm's new machine learning surgical assistant. He argues that even the best surgeon cannot be aware of everything happening during a surgery: an instrument could turn on accidentally, for example, and either remain unnoticed or cause a distraction.





"We don't want to replace surgeons, we want to support them," he says. "Surgery is complicated enough: it requires a huge amount of brain power and there are always risks. Any technology which can take away risk is valuable for patient and surgeon."

However bringing this new machine learning technology into the operating room means more computing power: "More chips in operating rooms, whether that's Intel or Nvidia, processing inputs in real-time."

The firm, which now sits within parent company Medtronic's robotics division, is playing "a supporting role in their robotic activities".

Nehme says a step-change is happening in healthcare thanks to the types of computational technologies it is developing. However he has not ruled out the possibility of one day returning to the surgical table himself, and recently volunteered his skills during COVID-19.

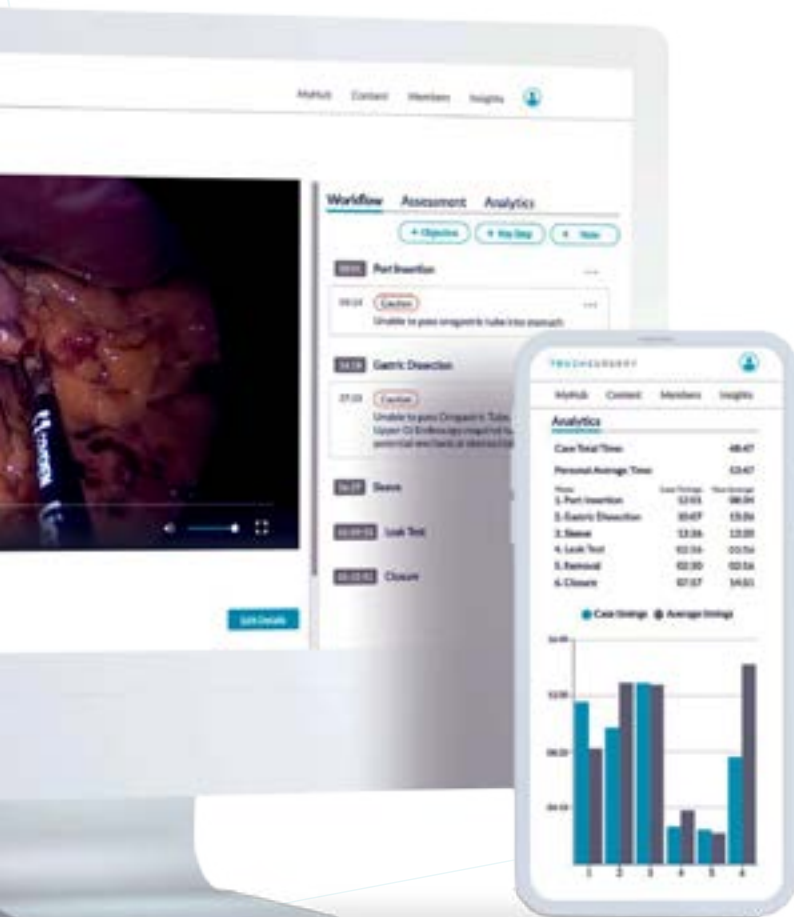
Despite a goal of helping the potential five billion people who don't have access to safe surgical services, he says he misses surgery because it is rewarding to directly make people better.

"I remember small things like children who had injured themselves, who three weeks later would have scars healing and be better," he says.

COMING TO A THEATRE NEAR YOU

Surgical categories covered by Touch Surgery platform

- Anaesthetics
- Cardiothoracic surgery
- COVID-19
- Emergency medicine
- General dentistry
- General surgery
- Global surgery
- Neurosurgery
- Obstetrics & gynaecology
- Ophthalmology
- Oro-maxillofacial surgery
- Orthopaedics & trauma
- Otorhinolaryngology
- Plastic, reconstructive & aesthetic surgery
- Respiratory therapies
- Trauma & emergency surgery
- Urology
- Vascular



NEHME ON TOPPING 100 HEALTHTECH PIONEERS RANKING

"This is welcome recognition of the importance of surgery.

"Sometimes surgery is forgotten in healthcare but it is a very important part because it is curative.

"I'm incredibly thankful to people for recognising the technology.

"Everybody on the list is a winner. It's a cliché to say so, but making healthcare better is not just an exercise in making better technology – but helping people in their time of need."



(ON BIG BUSINESS)

A decade as CEO of Virgin Money gave Dame Jayne-Anne Gadhia a front row seat for the open banking revolution. She explains why she launched a FinTech start-up during lockdown – and the reason for leaving her role as UK CEO of tech giant Salesforce after just six months

Words: Jonathan Symcox

For three decades the word Snoop immediately conjured the dreadlocked image of a certain American hip-hop artist.

But type Snoop into Google today and the top result is not of a multi-platinum-selling rapper, but a FinTech taking the fight to big business on behalf of consumers (yes, it's a paid advert).

If Dame Jayne-Anne Gadhia has her way, her start-up will also be the first Snoop on everyone's lips. "We did think about that, but decided we couldn't change our name because of him," she jokes in an interview with BusinessCloud. "If he decides to sue us, it'll make us even more famous!"

As CEO of Virgin Money for more than a decade, Gadhia witnessed first-hand the unstoppable rise of open banking and FinTech following the 2008 global financial crisis. "It started to become clear to me about three or four years ago that the big banks are going to continue to be very successful because they've got the money to develop – and so the challenger banks really need to be at the forefront of technical and digital innovation," she says.

"At Virgin Money we were focused on building a new digital bank which we hoped would be able to compete with the likes of Monzo and Starling in the new generation of banking."

However it all came to an abrupt end when Clydesdale acquired the firm in 2018. "They'd already got their own digital bank, which was a sort of digital front-end for their traditional



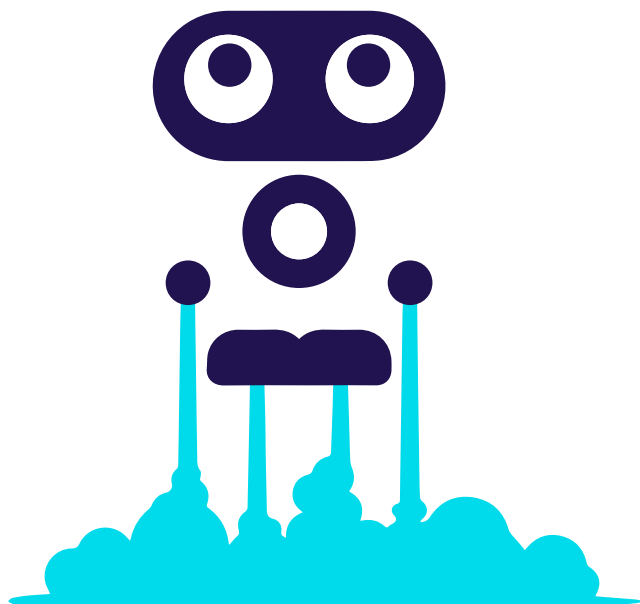
banking systems. My more innovative Monzo-like digital team were made redundant," she states matter-of-factly.

Soon afterwards they met for coffee and conversation quickly turned to the future. "They were obviously miserable that the excitement we'd all felt about building this new future wasn't going to happen," says Gadhia. "They said to me, 'Look, why don't we just do it anyway?'"

"One of my friends and colleagues over many years, [Snoop co-founder and CFO] Dave Dyer, said, 'I don't want to build another bloody bank!' We all agreed with that – but realised that we understood banking, systems and technology. So why not use all of that to go beyond banking, and to use banking experience to give customers a better deal?"

The idea for Snoop was born. The FCA-approved app connects to a customer's bank accounts and, using a mix of artificial intelligence and human expertise, gives tailored insights into how they might be able to save money. Suggestions range from swapping home insurance or energy provider to supermarket food deals and entertainment services.

These are delivered either through notifications or by directly visiting the app itself. "We knew that we had to make it simple and engaging and straightforward because banking is none of those things," explains Gadhia. "We're trying to help people see their banking in quick and easy ways that suit them, so they can categorise their spend, and see how to spend more efficiently."





You can certainly see the influence of Monzo on Snoop. Yet if you've always hated spending your free time researching multiple providers in order to make a saving, using the app could result in even greater personal benefits. "Historically part of the reason banks make profit is the apathy of customers. You think it might be costing you a few quid extra, but you can't be bothered to change – it's too complicated.

"One particular woman dropped me a note on Twitter to say how Snoop told her she could save £727 on her utility bill – and that it was quickly 'all done and dusted'. My development director was the first tester of our app and it told him that his Sky package had increased from £18 to £80! He rang up Sky and they reverted it to £18.

"After a long day, I myself just want to put my feet up and have a glass of wine – and I find out that I'm getting ripped off as a result. It shows how we've all overspent because it hasn't been that simple to see previously.

"This is you snooping on the big companies to find the better deal. We want to help customers to use their data for their own benefit, rather than the other way around."

Perhaps the name has negative connotations – particularly in the wake of the Facebook Cambridge Analytica scandal – but Gadhia has no regrets about adopting it. "People don't ask me how my new business is going – they say 'how's Snoop?' It's very memorable and

that's a powerful thing when it comes to branding.

"Virgin was a controversial name to use for the brand of a company back in the 1970s. But it's done it no harm at all!"

The firm, which employs 23 full-time staff in London and Norwich alongside another 20 at development company Hi Mum! Said Dad, attracted 5,000 beta customers in January 2020. The founder and executive chair says these testers urged her team to launch fully when COVID-19 hit – and it did so as the UK entered lockdown. A few weeks and a £3.2m funding round later, Snoop had 25,000 users.

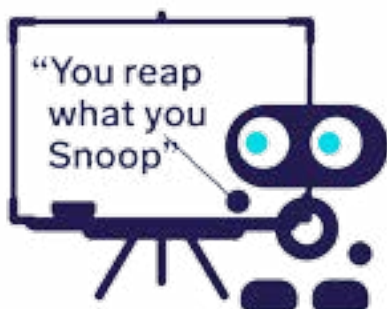
"RBS closed down [its challenger bank platform] Bo recently [just five months after launching]. Bo had less customers when they closed it than we got in our first week. Isn't that fascinating?" she asks mischievously.

"The big banks are obviously critical for the economy and for society, but I wonder whether in the future they will become more like utility companies: they'll provide the platform for banking while apps and services like Snoop will enrich customers' financial experience – because it's different to banking.

"When we launched Virgin in financial services [in 2007] I slept under my desk for days on end while we were testing systems and putting patches in place, getting the thing right. To be able to launch this business from lockdown so effectively, because of the technology, I find thrilling and extraordinary." She says her team



used to “jump through hoops” to gain access to marketing data which was potentially months out of date. In contrast, all of Snoop’s marketing spend is digital and can be viewed in real-time. “Our marketing director will work out how much money he wants to spend each day and with



which social engine – and by 11am he can see what’s working and what isn’t working and tweak it to optimise the day. It’s almost like doing a Sudoku!”

Having founded Snoop in January 2019, Gadhia accepted an advisory role at Silicon Valley software giant Salesforce, in part to learn more about the tech sector.

Upon meeting its billionaire entrepreneur Marc Benioff she found herself accepting the UK CEO job – but six months later returned to her original position.

“Salesforce is a brilliant company and Marc is an inspirational leader.

We hit it off and he asked me to run the London business as CEO,” she recounts. “Dazzled by his brilliance, I said: ‘Yes!’

“The truth of the matter is, when you’re working for a big American firm based in San Francisco, that

being a CEO in London isn’t the same as running your own business. You’re part of a big matrix. And effectively, that meant that I’d be a sales director, because all of the strategic decisions, the financial decisions – which is what I’m good at – that’s really all done out of San Francisco.

“I probably knew that when I signed up, but it wasn’t immediately clear to me until I was actually in the London office. They are lovely people, but it’s a sales team. And the role really was what we in the UK would call sales director. And that’s not what I am.”

Snoop has received “substantial and significant” financial backing from Salesforce’s investment arm as part of its total £10m funding. The firm, which has long-term ambitions to grow internationally, hopes to raise a Series A round towards the end of this year.

In 2015, Gadhia led a government review into the representation of women in senior managerial roles in financial services. The resulting report prompted HM Treasury to launch the Women in Finance Charter. There are now 320 companies signed up to this – but Gadhia is concerned that coronavirus may stem the tide of change.

“I worry because the problem with gender work is that, particularly if it remains the task of the HR department rather than the CEO, when trouble hits it can be something that falls low down the priority list,” she says. “It’ll be really interesting to see, as we all come back to work after the crisis, if we are coming back as a more diverse work population – or not.

“Diversity might not be at the fore of everybody’s thinking as we start to crank the handle again. Part of me understands that – and part of me is fearful of it.”

SNOOP IN NUMBERS

Founded – January 2019

Staff/developers – 43

Customers – 25,000

Total funding – £10m

Featured providers – 1,000

DAME JAYNE-ANNE GADHIA PROFILE

BUSINESS

Chartered accountant,
Norwich Union

Founder, Virgin Direct/
Virgin One account

MD, RBS mortgage/consumer
finance divisions

CEO, Virgin Money

UKI CEO, Salesforce

Founder, Snoop

PERSONAL

Awarded CBE for services to
banking and voluntary service to
the community (2014)

Appointed government’s Women
in Finance Champion (2016)

Published Empowering
Productivity: Harnessing the
talents of women in financial
services report (2016)

Founder, government’s Business
Diversity and Inclusion Group
(2017)

Published autobiography The
Virgin Banker (2017)

Made a Dame for her contribution
to financial services and women in
the finance industry (2018)

Only with great people,

is a great business
possible.



Specialists in technical and creative recruitment

We match people with roles by looking beyond skills and experience. We discover who they really are and what they stand for. Our unique approach matches shared values, ethos and ambition, finding the perfect fit for both the candidate and business.



Our psychometric profiling techniques enable us to move beyond CVs and traditional interviews, providing insight into candidates' goal orientation, drive and beyond.



Aptitude testing breaks down a candidate's strengths and growth areas, helping to ensure that responsibilities within new roles match the candidate and business needs perfectly.



Our consultants are specialists in disciplines and locations; they're able to share insight, key market data and competitor analysis giving our clients an advantage identifying and securing top talent.

Start the conversation today

0161 215 3818 | [MySort.co.uk](https://www.mysort.co.uk)



MY '**DEATH**' LED TO MENTAL HEALTH START-UP

When scientist Dr David Plans suffered a cardiac arrest and flatlined through pure overwork, he began a quest to build an artificial intelligence system capable of warning others

Words: Jonathan Symcox



//

You know, you people in suits usually stay dead. As you survived, I can tell you there's nothing wrong with you – you just died because you worked too much."

As far as advice goes, it doesn't get much starker than that delivered to Dr David Plans in a Belgian ambulance.

Scientist Dr Plans, who was overseeing an unsuccessful business merger at the time, was running for an aeroplane in Brussels Airport when he suffered a cardiac arrest. "It felt like an elephant sitting on my chest, and then I passed out," he recounts to BusinessCloud of that moment back in 2003. "I woke up briefly and it felt like I'd been hit by something enormous, like a train, perhaps: massive pressure, all at once.

"I remember being in an ambulance and lots of shouting. I flatlined in the ambulance. They brought me back, but the nurse who woke me up let me know that there was nothing wrong with me – I had simply died of overwork and exhaustion and starvation."

It was another decade before Dr Plans would found BioBeats, a digital health start-up aiming to help identify the

warning signs in others. However the journey began right then and there as the artificial intelligence expert sought reasons for his collapse.

"I didn't believe that I could just die like that, running for an aeroplane, as young as I was," he explains. "I didn't make serious changes to my lifestyle and my behaviour until years later because I was convinced that there must be something wrong with me.

'NOTHING WRONG'

"The more I studied, the more I figured that there was nothing inherently wrong – so I was convinced that I had some rare neurological disease. But it turned out that the nurse was absolutely right: there was no illness or disorder. There is absolutely nothing wrong with me."

Exploring the phenomenon of 'overwork death', Dr Plans found that the Japanese have a word for it: *karoshi*. "It quite literally means death by overwork and starvation. What primarily happens is people forget: they get so stressed out that they forget to eat and drink; to take care of themselves; they sleep badly; and this all

leads to a cycle of anxiety and depression which can then lead to death.

"Being busy can kill you if it is never managed against the needs of your body. Your mind loves to be busy and it will prioritise it, no matter what your body says, because it wants to be entertained and engage with everything. Your body, on the other hand, has different needs. And some of those are really basic, like eating and getting hydrated, but some are really complex emotional needs like touch and safety.

"So beyond a certain level of stress, there are things that the body needs that just simply don't get resolved and the more unresolved they become, the more out of touch you become with your body.

"I wanted to build a system that could detect the sort of mental disorder which might lead to this sort of death and warn people that this is happening."

The contradiction of building a start-up to help people find balance in their lives is not lost on Dr Plans.

"You know how doctors smoke and cobblers' children have no shoes? The last thing you want to do if you really want to have a stress-free life is to run a start-up! There's a confluence of interest: you want to build a platform to have an impact in society and at the same time, you have competing interests, such as those of your investors and those of your family.

"So you end up potentially working 20-hour days even when you're designing a platform that literally warns people that they shouldn't do that."

The firm has developed a wearable device to collect biometric data – such as sleep cycles, heart rate and physical activity – alongside psychological and neurological data, psychometric tests and questionnaires.



This is connected with an app, BioBase, which allows users to keep track of their mental and physical health and make suggestions on how they can improve wellbeing – or even refer them to therapy.

It is working with businesses such as JP Morgan and KPMG while late last year it launched a pilot programme with WPP Health Practice which is available to staff in its London, Milan and Sydney offices. All data sent to a company is aggregated and anonymised to flag up trends rather than individual reports.

“Most people don’t have very much control over their jobs so we help them start to cope with stress better and to organise and optimise for it,” says Dr Plans. “It could be to take more

exercise, get better sleep – or advice which is more complex than that.”

ACCIDENTAL CEO

Several seed investment rounds have helped build the business over the last five years. Describing himself as an “accidental CEO”, Dr Plans returned to the top leadership role in 2018 having appointed someone with “more industry experience” for a brief 10-month period.

“We found somebody awesome and he left us in a much better place than when he came in,” he says. “I learned a great deal from him, watching how processes are put in place and how teams are built – anything from hiring to training and HR practice.

“But there comes a point where, if what you’re building doesn’t exist in the world, especially as it’s very complex, it’s very unlikely other people are going to understand it as well as you do.”

The London-headquartered company is also looking to build out its team in San Francisco.

“Ultimately, the market is largest in the US,” says Dr Plans. “The kind of thing we do, engaging with corporate and insurance companies, is ubiquitous over there, whereas here only larger corporations have private medical insurance and most people rely on the NHS.

“However the UK is the most fertile market for experimentation in the world, so it made sense to build here and to be headquartered here.”

BIOBEATS IN NUMBERS

Investment
\$6M+

Staff
20+

Offices
LONDON & SAN FRANCISCO

ARR target
£1.6M

DR DAVID PLANS – A POTTED PROFILE

THE STUDENT

- DPhil, Experimental Psychology, University of Oxford (ongoing)
- MSc, Experimental Psychology, University of Surrey
- PhD, Electroacoustic Composition, University of East Anglia

THE TEACHER

- Senior Lecturer in Organisational Neuroscience, University of Exeter (ongoing)
- Lecturer in Entrepreneurship and Innovation, University of Surrey
- Lecturer in Music, University of Hull
- Lecturer in Digital Programmes, Brunel University
- Spoken at the European Conference on Artificial Life, IRCAM, the Darwin Symposium and the Computer Arts Society
- Member of the INDEX group
- Researcher at Alan Turing Institute

THE ENTREPRENEUR

- CEO/chief science officer, BioBeats (ongoing)
- Director, Adaptive Media Labs
- CEO, Mindful Sound



HOW UK HEALTHTECH RESPONDED TO COVID-19

THE HEALTHCARE SECTOR TYPICALLY ADOPTS TECHNOLOGY WITH CAUTION, AS EVERY DECISION TAKEN COULD BE A MATTER OF LIFE AND DEATH. HOWEVER THE ARRIVAL OF COVID-19 FORCED IT TO INNOVATE AT GREAT SPEED. ENTREPRENEURS AND EXPERTS EXPLAIN HOW THEY MET THE CHALLENGE

Words: Alistair Hardaker

TRANSFORMING COMMUNICATION

WITH PATIENTS

Zesty's platform allows patients to manage their hospital outpatient appointments, read correspondence, attend video-based consultations and store a personal copy of their clinical record.



"We're moving away from the idea that you can communicate effectively with a patient by writing them a letter," explains co-CEO James Balmain. "Most of the correspondence takes five, six days to arrive. Whereas if you deliver these things digitally, it's fairly instant."

The technology also allows for a series of communications instead of a single letter designed to detail complex pre-procedure checklists. Balmain says this decreases the chance that a patient will be turned away, for instance before an MRI scan if it is discovered that they have metal inside their body.

With regards to COVID-19, Balmain says that cancelled routine hospital appointments will still have to be dealt with. "What's really important is how all the technology vendors can actually help hospitals to get back on their feet again, and deal with this once we get back to some semblance of normality."

ON WARDS

Traditional hospital workers looking to speak to colleagues have historically relied on pagers or phoning a floor to locate them.

During a pandemic, these extra seconds become even more valuable. "It might take five or 10 minutes for them to connect with where they want to go, so being able to save that time by calling directly is just time-critical," says Hugo Stephenson, an Australian doctor and CEO of Induction Healthcare.

The firm's Induction app allows more than 140,000 users – mostly doctors – to securely share phone numbers and bleeps, bookmarks, documents and messages. Its MicroGuide app, used across approximately 75% of NHS trusts, has 173,000 users and supported Barts Health NHS Trust in the Nightingale London project with antimicrobial and COVID-19 content.

"A junior doctor could be sat at two o'clock in the morning trying to get through to somebody that

can help them," says Stephenson. "That is not the time to be fishing around, looking through papers, trying to search the internet or work out how you can actually get help."



WITH STAFF

BJSS has been involved in the creation of the NHS' core app since its inception in 2018.

Lauren Bevan, its head of health and social care, says its digitised sick notes feature was used 400,000 times in the first few weeks as NHS staff affected by coronavirus looked for ways to justify their absence without leaving home. Its messaging service saw one billion messages sent between March and May.

"We've been working with NHS Digital to flag to GP practices which patients need to be self-isolating," says Bevan of coronavirus-related measures. "That was quite a quick fix for us, but it's a longer-term thing to make sure that the information on there is correct."

bjss

REMOTE CONSULTATIONS

VIDEO-CONFERENCING

The MyGP app is designed to provide digital-first care including appointment booking, medical records, repeat prescriptions and now video consultations.

With 1.6 million patients and 6,500 GP surgeries signed up, the platform saw a 1,695% growth in these remote consultations between February and April.

"This situation that we've sadly found ourselves in has forced everyone to adopt it and realise this is the future. It's just sped things up a little bit in our timelines," says communications and PR manager Louise Kitchingham. "Now every practice in the country has got a remote consultation and facility in place – and they've had to adopt it."

"I can't imagine [that in the near future] you'll be sat in a waiting room for 40 minutes flicking through your six-month-old OK magazine before you go and see a GP."

She says clinicians previously hesitant about embracing the new tech had found it a welcome surprise. "There's so many things that could be managed remotely. GPs' thoughts have definitely fast-forwarded a few years."

VIRTUAL TRIAGING

Library House Surgery in Chorley is one of 8,000 in the UK and has nearly 17,000 patients, 23 consulting rooms and a range of nurse practitioners.

In March it moved to a triage system which largely relied on phone calls and video consultations, with a select few in-person appointments in a designated 'red zone' for the likes of blood tests and anti-natal services.



Six months earlier the firm had begun a pilot of remote video consultations using accuRx software, with the aim of creating more sessions for patients and a more flexible working environment for its clinicians.

IT and operations manager Simon Elcock says the technology went from 'nice to have' to essential when coronavirus hit. "COVID gave us that push, and pretty much overnight we went from clinicians being reluctant to use remote ways of consulting to it becoming embedded," he says. "It's unbelievable – I've never seen anything happen so quickly."

He says it will be difficult to return to its previous way of operating. "Even the clinicians who were reluctant to work remotely now get to spend more time with the family and seem a lot less stressed out.

"The workload is still very high, but I think it's given them a balance. It's given them that breathing space, and allowed them to see how they can work differently."

TREATMENTS

HALTING INFECTIONS

Hy-genie is a smart hand sanitiser dispenser which communicates with hospital staff's name badges and is designed to measure which parts of a hospital are adhering to hand-washing guidelines.

Richard Cook, a former director of infection prevention and control at Alder Hey Children's Hospital, came out of retirement in 2017 to create the product. When COVID-19 swept

the UK he rejoined the front lines, with Gavin Delaney having already taken over as CEO.

Coronavirus prompted Hy-genie to quickly develop a 'Lite' version of the product which forgoes the tags and individual usage data in favour of measuring overall usage. It is currently being used in Alder Hey, which has invested in the start-up.

Delaney says basic 'paper and clipboard' monitoring of sanitisation in other hospitals "went out the window" as they reacted to



the pandemic. "We're trying to make sure that we get Hy-genie Lite ready, properly developed and established to get a beachhead in one hospital, and then we'll look to roll it out across other trusts.

"Everyone we've spoken to clearly recognises the need to wash your hands. It's a universal message that we hope people won't get bored with."

BLOOD PRESSURE TECH

Sky Medical's geko device (pictured left) is an alternative to blood pressure cuffs.

The wearable, worn on the leg, helps to increase blood flow in the deep veins of the calf by stimulating the common peroneal nerve with painless, regular electrical impulses. It is aimed at preventing deep vein thrombosis in inactive patients, who have often recently left surgery, as well as treatment of oedema and wound healing.

But when a third of coronavirus patients admitted to hospital began to present blood clotting, the device took on new responsibility. It was quickly prepared for use in Nightingale venues, although these overspill field hospitals did not ultimately overflow with COVID-19 patients.

"The primary mechanical means of preventing deep vein thrombosis or blood clotting formation is to use something called IPC, which are like blood pressure cuffs that fit around the legs," explains EMEA distributor manager Chris Walker. "A pump inflates and deflates them, which pushes venous return to stop clot formation.

"The issue was the sheer number of units they would have needed to cover the number of beds they were planning to have open for those patients. They simply weren't available through manufacture.



"The geko fitted the bill as a single-use disposable, because of the infection risk with COVID, and as it fits all sizes of patients, because you just don't know what's going to come through the door. In COVID patients, you've got a clotting risk all over the body because of the way the body's reacting to the disease."

MENTAL HEALTH

LOCKDOWN BLUES

Kaido's digital wellbeing platform gives a firm's staff the opportunity to self-manage mental and physical health through gamification and personalised interactive content.

Currently serving 300,000 employees, founder Rich Westman made the product free for SMEs for a trial period as part of a coronavirus support package. He says wellbeing support has traditionally been "a luxury of the blue chip enterprises".

"Employees are having to adapt to new ways of working and they're more anxious and disconnected from their teams," he says. "For employers, there's also been a real challenge in keeping those remote and furloughed employees engaged and connected. There's a need for a welcome morale boost now and again."

PROTECTING THE ELDERLY

Engineering and prototyping firm DefProc might not class itself as a HealthTech, but its consideration

for social good has brought its latest innovation into the spotlight.

MD Jen Fenner, part of a wife-and-husband team, developed Push to Talk, a connected device designed for those feeling isolated. Pressing its button connects a user's landline phone with the phone of another user who has also recently pressed their device.

The device relies on a new technology called LoRaWAN, a low-power wide-area network protocol similar to Bluetooth, as elderly people often do not have Wi-Fi.



"The idea is that you talk to lots of random people, as you would in the street," says Fenner. "It gives people the sense that they're not on their own."

Coronavirus has given this side project new urgency. "We've had a lot of contact from care homes, housing associations and the local council. They reached out to us to ask how we can get this up and running across the city."

The firm has received support to get the product ready for manufacturing and is working with Liverpool City Region to raise funding.

REMOTE TECH RISKS 'TWO-TIER' NHS

Dr Victoria Betton, CIO of Mindwave Ventures, warns a hasty transition risks excluding millions



"I think there's a real risk that, if we don't pay attention, we might be in danger of creating a two-tier health system."

"We need to make sure that we don't leave those people behind; that we help them become included; that we look at assistive digital."

"This whole notion of a digital-first NHS might actually disadvantage significant groups of people if we're not careful."

"We also need to consider the fatigue associated with looking at a screen in the way we all are for significant periods of time."

"However there has been this real case of advocacy for technology if we can leverage this moment; pay attention to things like implementation; and really get some of these technologies well embedded in practice."

"I think we could see some real positives in terms of efficiency, flexibility, experience and outcomes."

"GPs I have spoken with have shown a decrease in professional reluctance when it comes to new technology. The benefits [of remote consultation] suddenly massively outweigh the barriers or the reluctance to engage with technology, because people are concerned for infection and their lives."



Advanced platform for marketplace and vendor management solutions.

Powering your business ecosystem.

MET enables retailers, buying groups and brands to adopt an e-commerce marketplace model streamlining supply chain, expanding inventory, increasing customer base and scaling into new markets.

www.mercartoenterprise.com

hello@mercato.com

PROCUREMENT - RETAIL - SOURCING - DROPSHIPING - PIM - COMMERCE - MARKETPLACE





REGIONAL INNOVATION WINNERS

**BUSINESSCLOUD'S LATEST RANKINGS CROWNED THE MOST
INNOVATIVE TECH CREATORS IN THREE UK REGIONS.**

SEE THE FULL RANKINGS AT BUSINESSCLOUD.CO.UK

South East



1. Reaction Engines
2. Brill Power
3. Oxford nanoSystems
4. Swiftaid
5. Electrospinning Company
6. Sparkbox
7. Altitude Angel
8. GoHenry
9. Percept Imagery
10. PassivSystems

Wales



1. BioPaxium Technologies
2. Rescape Innovation
3. Antiverse
4. Confused.com
5. Health and Her
6. Signum Health
7. Urban Intelligence
8. Veeqo
9. Amplyfi
10. GPC Systems

South West



1. YellowDog
2. Ultraleap
3. Recycling Technologies
4. Filmily
5. Archilime
6. City Science
7. KETS
8. Industrial Phycology
9. Onbuy.com
10. DeGould

Advertising opportunities:
sponsor@businesscloud.co.uk

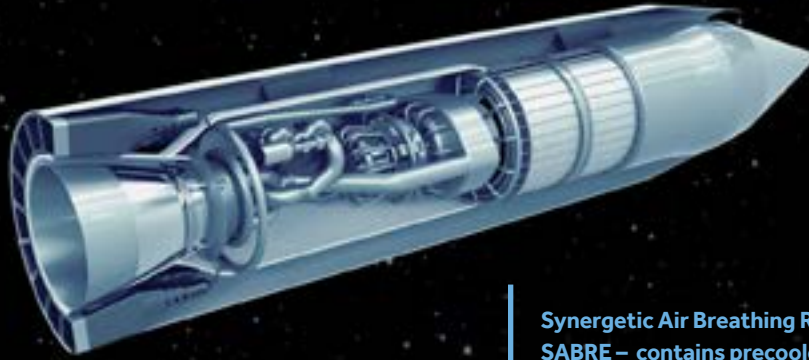
General queries:
Editor: Jonathan Symcox - jonathan.symcox@businesscloud.co.uk

THE UK FIRM PLANNING TO UNLOCK SPACE

PROPULSION TECHNOLOGY DEVELOPED BY SOUTH EAST
TECH 50 WINNER REACTION ENGINES COULD ONE DAY
ENABLE DAILY TRAVEL TO AND FROM SPACE. CEO MARK
THOMAS OUTLINES HOW ABINGDON'S "WELL-KEPT
SECRET" IS LOOKING BEYOND THE NEXT CONCORDE AND
TO HYPERSONIC TRAVEL



Words: Jonathan Symcox



Synergetic Air Breathing Rocket Engine – SABRE – contains pre-cooler technology able to deal with extreme temperatures found at incredibly high speeds

On a trip to Manchester Airport's Runway Visitor Park I was privileged to climb aboard Concorde.

Graced regularly by the likes of the Queen, Elton John and Madonna, the world's first supersonic airliner was decommissioned in 2003 after 27 years of commercial service.

Almost two decades on, supersonic travel is set to return – eventually – with companies such as Aerion and Boom

established, people will want to push faster and go beyond that. We're looking to go hypersonic – which is more than double the speed again. And that's a completely different threat domain."

Reaction Engines has developed a Synergetic Air Breathing Rocket Engine – SABRE – which contains pre-cooler technology able to deal with extreme temperatures found at incredibly high speeds.

speed of sound, the air temperature as it impacts the airframe or the engine is 1,000 degrees centigrade. It causes steel to glow red and other metals to actually melt.

"The ability to take that away as a problem and have a supercooler is hugely powerful in being able to engineer a vehicle that can go very, very fast. Many, many people have tried it in the past in different ways and failed.

"WE HAVE A TECHNOLOGY THAT TAKES AWAY MEGAWATTS OF THE ENERGY INSTANTANEOUSLY. IT'S A UNIQUE TECHNOLOGY AND A UNIQUE POSITION WE FIND OURSELVES IN."

"Concorde was twice the speed of sound. The Lockheed SR-71 Blackbird spy plane was three times the speed of sound and therefore had to be made of higher temperature capability materials," says Thomas. "It had all sorts of challenges

"We have a technology that takes away megawatts of the energy instantaneously and allows you to build an engine which will operate successfully around that. It's a unique technology and a unique position we find ourselves in."

Thomas joined in 2015 following a 25-year career at Rolls Royce. He recounts: "At the beginning, when I met the people and saw some of the technology, I thought: 'I've got to be part of this. I've got to do this now, or never.'

Aerospace confident that they can make it an economically viable proposition once more. However one company based in Oxfordshire is aiming far beyond that.

"We're looking beyond the next Concorde," Mark Thomas, CEO of Abingdon-based Reaction Engines, tells BusinessCloud. "The speed of air travel has actually gone down over the last 40 years because people have been focused on efficiency. That is obviously a huge imperative – but there is also a need for speed and there are people who will pay for it.

"Once Aerion and Boom Aerospace are

and was right on the limits of technology capability."

A trial last year with US hi-tech agency DARPA – a body widely credited with helping to establish the framework of the internet – saw Reaction Engines' tech successfully deal with temperatures associated with Mach 5, or five times the speed of sound.

"As you go faster, the heat energy goes up exponentially," explains Thomas. "There is a heat barrier you've got to punch through if you want to go beyond three times the speed of sound. At five times the

"It's a really great company and exciting place to be. It's deliberately designed to look a bit different to the norm. Even if you include me in the management team, the average age is about 32. For an aerospace business, that's really unusual."

BAE DEAL

The company would move its focus from pure research and development to industry sponsorship. Thomas



secured a £20.6 million deal with BAE Systems for 20 per cent of the business, which he says was a "big deal" as it was a deviation from BAE's usual approach.

"We've got a pretty high profile within the industry that we play in, but outside it we've been a fairly well-kept secret," he says. "The BAE deal definitely got us on the radar in a big way. People started to sit up and pay attention."

Further strategic fundraising from big-name partners followed in 2018 and the firm's workforce has since grown from 65 to more than 200. However the huge investment brought added pressure to deliver meaningful outcomes – and the DARPA test was final proof that Reaction Engines has a technology with the potential to reinvent air and space travel.

"Being brutally honest, a large number of people thought we were not going to pull that off. And we did it with 100 per cent success," he says. "To run a massively successful test campaign under the eyes of government agencies with a high level of industry awareness was a big deal."

"Our tech is of interest to defence customers because they want to get somewhere as quickly as possible. But it is also of interest to commercial and there's a big predicted market for hypersonic travel in the future."



Boeing are also very public about their plans to do high-speed air travel."

MOONSHOT

Reaction Engines is working with Formula 1 to look at ways of including its tech into the cars while it also has an eye on clean energy and waste heat recovery as it looks to commercialise. However a larger and more eye-catching project could take it beyond the Earth's atmosphere – and it may not even be a 'moonshot'.

The company has worked with the UK Space Agency and European Space Agency, with the UK government investing £60m in SABRE as part of a 'strategic approach to space'. The propulsion tech could make space access far easier and more affordable.

"We're all reliant on services that satellites provide. It would be very hard to imagine even an hour without space, because everything we do is reliant on it," says Thomas. "But we also see the bigger vision that people like [Amazon boss] Jeff Bezos talk about: one day a lot more will be done in space. It is totally possible that we'll be doing in-orbit manufacturing or onward transit to other planets because the technology to enable that is coming fast."

"What's our role in that? A new type of engine that's multiple times more efficient than a rocket engine and enables you to build a truly reusable vehicle that could just shuffle payload – whether satellites, infrastructure or people – to and from orbit on a daily basis."

"That's the direction of travel of the industry."

TIMELINE TO MACH 5

1989 – Company founded

Rolls Royce propulsion engineers Alan Bond, Richard Varvill and John Scott-Scott evolve work on RB545 engine

2001 – First angel investor

Paul Portelli's investment kick-starts experimental lab programme and proves out heat exchanger/frost control tech

2004 – First major investor

Nigel McNair-Scott, keen to enable 'reusable' space access, develops global shareholder network

2008 – EU LAPCAT study

€2m government research contract allows firm to demonstrate Mach 5 heat exchanger capabilities

2012 – SABRE development begins

UK government commits £60m to project after manufacture of first fully operational precooler

2015 – BAE investment

Mark Thomas joins and moves focus from R&D to industry sponsorship with £20.6m deal

2018 – Further strategic investment

Likes of Boeing and Rolls Royce become backers with £26.5m of strategic fundraising

2019 – Hot HTX test

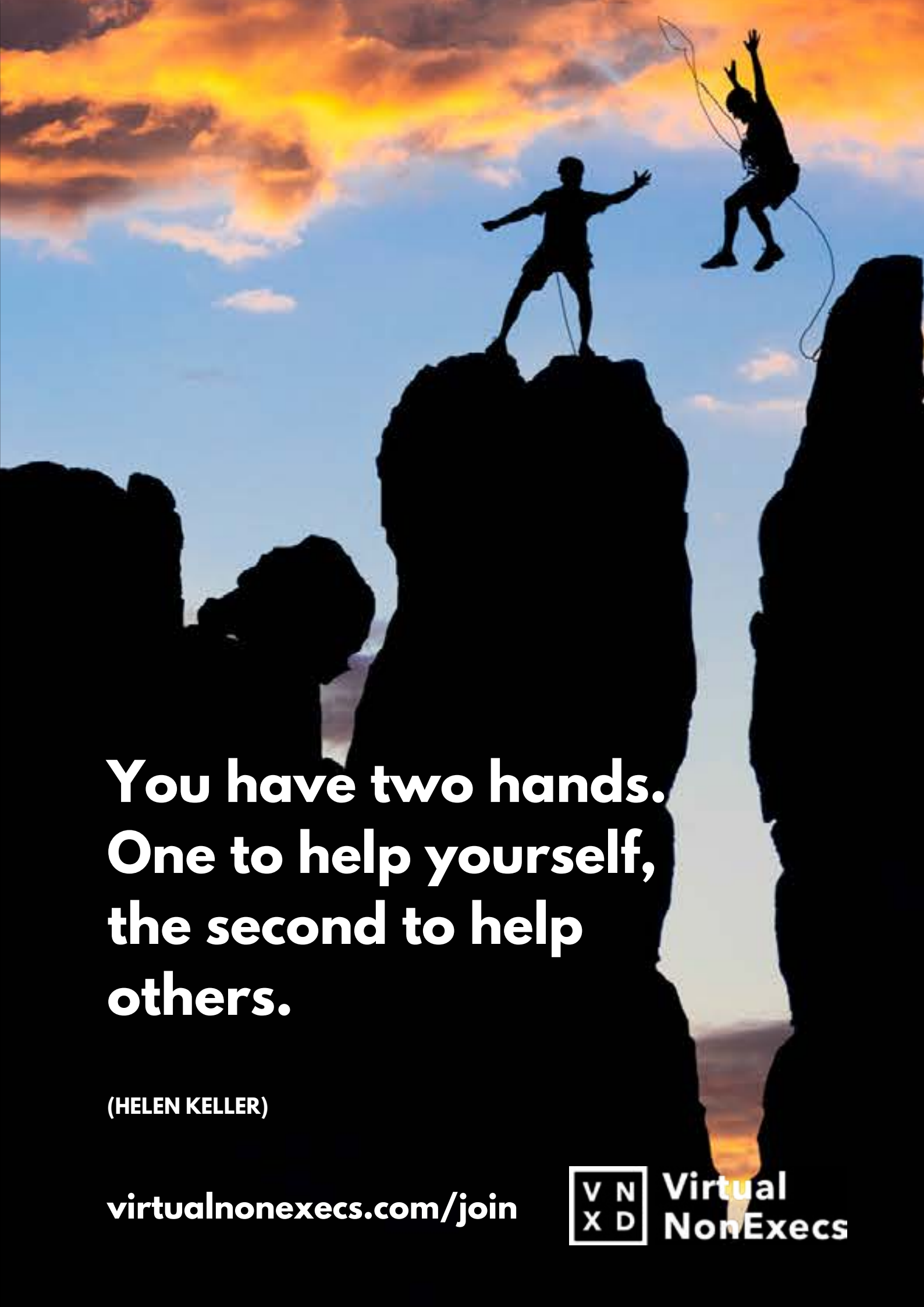
High-temperature airflow testing in Colorado sees tech successfully deal with 'Mach 5 temperatures'



CEO ON TOPPING SOUTH EAST TECH 50 RANKING

"It's just a huge accolade. The company has taken a long time to establish itself and we have people that work extremely hard on this because they really, really want to do it."

"To see that recognised by reputable bodies such as yours against tough competition and more established businesses is really incredible. It really gives me a lift, and the team deserve it. They never fail to impress me."



**You have two hands.
One to help yourself,
the second to help
others.**

(HELEN KELLER)

virtualnonexecs.com/join



OPPORTUNITY KNOCKS

STUDIOS DESPERATE FOR MORE COMPUTING POWER TO RENDER CGI ANIMATION CONVINCED GARETH WILLIAMS TO STRIKE OUT AS AN ENTREPRENEUR. FIVE YEARS ON, YELLOWDOG HAS DIVERSIFIED INTO OTHER MARKETS. WHEN COVID-19 HIT, SOME DOORS CLOSED WHILE OTHERS OPENED

Words: Jonathan Symcox

C OVID-19 has clearly hit some sectors harder than others – but sometimes the effect is more difficult to estimate.

Bristol-based YellowDog serves up intelligent access to cloud computing power for the likes of entertainment studios, financial services and aerospace. With 2,500 customers in 50 countries, and 200 per cent year-on-year growth over the last three years, it was no surprise to see it top BusinessCloud's South West Tech 50 ranking for 2020.

The casual observer might consider such a company relatively unaffected by the pandemic – but they would be wrong.

"It's been pretty intense, to be honest," CEO Gareth Williams confides to BusinessCloud. "We have been impacted. We sell to big businesses – such as banks and aerospace companies – and all the emerging technology projects, which we are classified as, have been put on hold."

New business in the entertainment sector has also dried up. "Imagine people making animated features or visual effects for the likes of Marvel and Disney – the security they have around making these productions





is insane," he explains. "The security assessment that we had to go through to get Disney-certified has been far more stringent than anything we've had to do for a bank.

"They've had to remote-enable their entire workforce, which they've never had to do before. So there's been like a 60- to 90-day delay on those sorts of new sales coming through."

Williams has been forced to cut his workforce from 32 to 21. He describes the decision as "rubbish, horrible, disappointing... but necessary".

But as doors into some sectors closed – temporarily, at least – others have now opened. A long-term goal to eventually serve its software into life sciences has accelerated to the point where YellowDog recently signed deals in virology and drug discovery – projects of great relevance to the fight against coronavirus.

"We didn't think we'd be doing any business in life sciences this year at all – we thought it'd be an exploratory business development, building relationships," says Williams. "We're now working with an institute which researches viruses that go from animals to humans; and another one looking at bringing drugs to market faster."

Rewinding to 2015, Williams left behind a career in product management at the likes of Orange, Experian and Arieso to set up the business. That initial door swung open as business conversations increasingly highlighted a lack of access to computing power.

"When you hear businesses talking about urgent, pervasive problems, there's opportunity there," he says. "The way we designed the platform was to accelerate complex computer-hungry

applications – such as rendering CGI, risk models in banks, weather forecasting or computational fluid dynamics in aerospace – to ensure they are delivered on time and on budget."

Depending on the requirements of the client, the software can automatically source the cheapest, highest-performance or most environmentally source of compute from within the business itself or across multiple cloud providers.

The platform's power was best illustrated when a Thai studio looking to create a virtual reality experience for LEGO came calling. "They were going to be late in delivering it – and they couldn't be late," says Williams. "We used so many GPUs across multiple different cloud providers – Alibaba, AWS and Oracle – that when you added it all together, the production ranked, in terms of Petaflops, as the eighth fastest supercomputer in the world."

YellowDog secured £2.5 million funding in March 2019 and intends to grow its presence in France and Germany as well as North America. Williams expects its next round of investment to take place over the next 12 months, having been delayed by COVID-19, and says it is rethinking its approach to international expansion.



"We have plans to set up a sales and operations office on the West Coast of America. It's possible to work with people on the West Coast when you're in the UK, but the time zones are challenging; same in Australia," he says. "But in the post-COVID world, is that the right way to do things? We don't know. It's going to be an interesting six months or so to see how things settle out."

YELLOWDOG'S CLIENTS

Giant Animation

Fulcrum Asset Management

PriestmanGoode

AECOM

Brown Bag Films

Powell Dobson

Blue Zoo Animation

WILLIAMS ON TOPPING SOUTH WEST TECH 50 RANKING

"We are surprised to be voted number one in the ranking. I'm very flattered, given the quality of the other businesses in the South West.

"In Bristol alone you've got Graphcore, Ultraleap, Open Bionics, Blu Wireless – some amazing companies. We're really, really, really, really pleased."

SOUTH WEST TECH 50 TOP 5

1. YellowDog (Bristol)

Helps companies source computing power

2. Ultraleap (Bristol)

Virtual touch technology

3. Recycling Technologies (Swindon)

Turns all post-consumer plastics into oil

4. Filmily (Totnes)

Automatically curates films from events based on fan-based content

5. Archilime (Torbay)

Architectural visualisation and training academy

Home is where the smart is



SMART TECH CONSULTANT ROB COLLINGRIDGE BELIEVES THE HOME OF THE FUTURE SHOULD DO MUCH MORE THAN PROVIDE A ROOF AND FOUR WALLS

Words: Jenny Brookfield



Hair straighteners were switched off at 7.28am this morning at Rob Collingridge's Ipswich home, having been used for three minutes and 40 seconds.

The garage door was opened at 12pm and someone entered the master bedroom at 12.53pm, after the room had been empty for two hours, nine minutes and 11 seconds.

The previous day the shed door was opened at 9.49am, activating a security camera, and earlier that same day a coffee machine was switched on at 8.47am, using 644.5W of electricity.

So says the Twitter feed reporting activity in the smart home Collingridge has built for his family over the past 12 years. The account, @Smartest_Home, was set up to demonstrate the potential for smart home technology, a passion he developed during 30 years working for BT, latterly as an innovation consultant. One of the first four people within BT to work on internet services, he worked on Campus World, the telecoms provider's first internet service for schools.

Now a smart technology consultant with his own company, Smartisant, his approach is to practise what he preaches. "At BT I had to do demonstrations to show technologies working and that can be challenging because it's not a real-life environment," he tells BusinessCloud. "Because me and my family are living with these smart technologies, we can see real stuff happening in real time, which is much better than lab testing."

His ethos is that smart tech should be for a purpose rather than being introduced just for the sake of it. "It's easy to get hung up on 'gadgety' tech and the wow



factor but the primary aim that's driving me is that it should improve quality of life," he says. "For me the smart home is about how we get to the home equivalent of a self-driving car – something that works intelligently around us and makes life simpler. There's a lot of consumer tech out there but it's very much about products to sell to people without much thought about it fitting into the bigger picture."

300 SENSORS

The result of 12 years' work is that his home is fitted with about 300 sensors, all measuring and monitoring the way the building is used – and it's a growing body of work. The first smart tech he installed was automated lighting – lights coming on when the sensors say it's dark and turning off when it becomes lighter – and

then thoughts turned to making it more intelligent to factor in room occupancy. "That was when I started to write my own smart home controller because I couldn't find anything that did what I wanted on the market," Collingridge says.

What followed were smart functions around the home's security, heating and energy efficiency, and aspects like water and irrigation. A keen gardener, his conservatory plants are monitored by a smart irrigation system, which ensures they are watered when the soil moisture levels go too low. There are PIR sensors detecting movement in rooms and temperature sensors ensuring the home is kept at the optimum temperature and energy efficient at all times.

"My smart home now sees everything going on and that allows it to make much better decisions, which can be a difficult thing to do if you're buying bits and pieces from online vendors and having to link it all together," he says.

CONTEXTUAL

In his opinion, the 'contextual smart home' – one that sees everything – represents the next generation of smart homes. It knows the state of everything connected to it, such as which appliances and lights are on and which rooms are occupied, collates information from external sources such as current weather, forecasts, sunrise and sunset times, UV levels, pollen count and air quality.

It also knows about the people present within it as Collingridge has enabled the smart home to monitor his IP network so



it can see devices coming and going. "If my smart home can see my smartphone connected to the network then it knows I'm home," he says, adding that sensors in the beds show which bedrooms are occupied. "If the PlayStation is switched on, it knows a particular room



is occupied because that device has a fixed location." When son Ethan was younger, he set up the system to send a message to both of them to warn when he had been in front of the screen for a set amount of time, but now he is older that has been removed.

This is the beauty of the system. Rather than be bombarded with messages about everything, he can set up specific rules so that he is alerted when something unusual happens, for example if a side gate is opened late at night. Similarly, none of the data is stored on the cloud so it doesn't actually leave the home, safeguarding the privacy of the Collingridge family, which also includes wife Kim and daughter Emma.

His overall aim is to make the current complexity of smart tech more accessible and more passive. For

example, he has used wired sensors in many cases to remove the need for constant changing of the batteries and unsightly boxes that come with wireless methods. That's meant coming up with ways to embed sensors in doors, but ultimately it will result in a more user-friendly system that will be easy to set up for those who aren't tech-minded.

"There are so many advantages, including the energy you save when you leave a room and the light switches off behind you, but the challenge is choosing the right technology and making it intuitive enough to give the right user experience," he says. Bathroom extractor fans, generally switched on when a light cord is pulled, are an area of focus and can be controlled by a humidity sensor instead, meaning less unnecessary heat loss. It takes the control away from the user, which Collingridge believes could be useful in rented accommodation to prevent damp and mould problems where tenants haven't been proactive in ventilating rooms.

This is where his consulting work comes in. Collingridge is working with the likes of housing associations, boutique hotels,

charities that deal with people with injuries and construction companies to advise on smart technologies. The issue isn't always cost – he says he's spent just £1,500 on hardware in his own home – but on the ease of retrofitting some of these measures, which is why he believes developers should factor in smart tech during the planning stage.

NEW-BUILD DREAM

Another side of his business is in coming up with new products, including a wired flood sensor that alerts the resident to a burst pipe and then shuts off the water supply. This was inspired by a friend who was away on a two-week holiday while a loft pipe poured water into their home, ruining ceilings, photo albums and a Porsche in the integrated garage, and necessitated six months of remedial work.

Then there's his ultimate goal, which is to fund a new-build home designed purely with smart tech in mind. He believes he is 12-18 months away from work starting. "I can only do so much retrospectively in our home so I want to show how much better it would be if you had this stuff in from the start," he says. "I'm really interested in the green side of it, so I want to generate all the electricity locally so that it's off grid and the smart home tech will massively improve your footprint on the environment, which is a huge benefit.

"The building industry has a long way to go, at the moment it seems to be smaller companies willing to consider smart tech as a way of differentiating themselves, so hopefully we can help them. I'm trying to make life simpler for people and that's an easy sell, because everybody just wants life to be simpler."

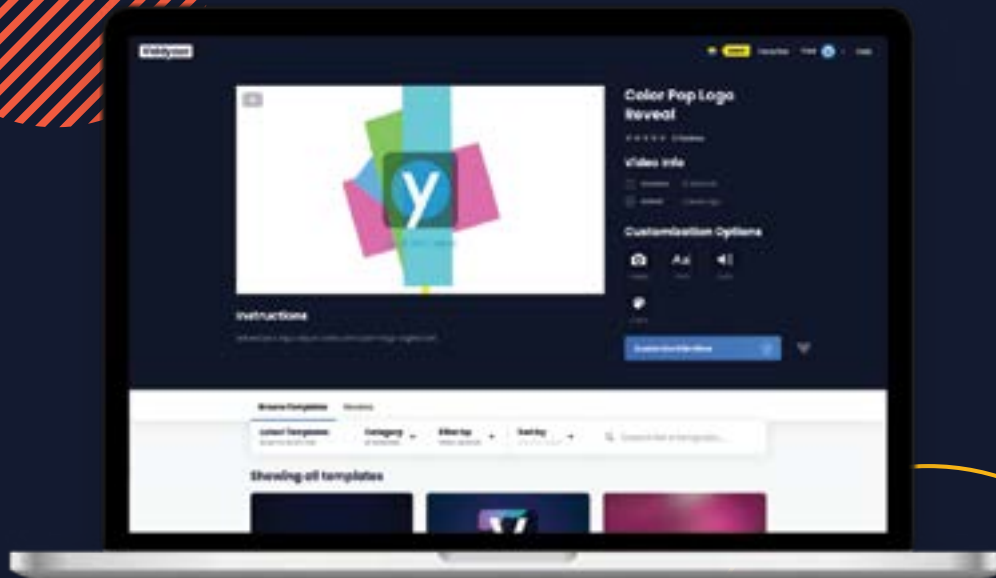


Viddyoze



The Home of Incredible Video Animation

viddyoze.com



Trusted by:

SONY

TESLA

PHILIPS

vodafone

DHL
EXPRESS

verizon

SCANIA

FIGHTING CHILDREN'S CANCER FEAR



COMBINING CUTE CHARACTERS
WITH TECH CLOUT, THE XPLORO
APP IS HELPING YOUNG CANCER
PATIENTS AT THE CHRISTIE OWN
THEIR TREATMENT AND SPEED UP
RECOVERY - AND IT ALL STARTED
WITH AN ENTREPRENEUR'S
DAUGHTER

Words: Alistair Hardaker

When Dom Raban's daughter was diagnosed with a rare type of cancer, he saw first-hand how daunting the treatment journey can be for children.

Issy was just 13 when she was diagnosed with Ewing's sarcoma, a cancerous tumour that grows within bones and the surrounding soft tissue. Seven years on and cancer-free, she is helping her father's vision of supporting others faced with the same terrifying scenario.

"It's weird to still be talking about children with cancer every day – but it's really cathartic," Raban, founder of digital agency Corporation Pop, reflects in an interview with BusinessCloud.

While he acknowledges that information was made available through books and leaflets, the designer and entrepreneur saw an opportunity to rethink the process. Raban first revealed the existence of the resulting side-project to BusinessCloud in 2016 – and last year Xploro, as it would later be known, became his full-time focus.

Among the app's team of developers is none other than Issy, now 20. "It's



incredibly rewarding to see young children, who are going through similar treatments to my daughter, being helped by Xploro," Raban says.

Like many games for children, the Xploro app centres on a user's customised 3D avatar. This cheerful, personalised virtual friend doubles up as an all-knowing guide full of information about upcoming treatments.

The character can explain in simple terms what the child should expect from his or her next appointment – and even take them through a CAT scan to highlight how the procedure doesn't hurt despite the scary

chamber and loud noises. Its design is inspired by lifestyle simulator The Sims while the language could be straight from a Super Mario game.

"Nintendo's language style is non-patronising to younger children, but simple enough for younger people to understand. We've mimicked that approach," says Raban.

However the character is a great deal more than a prewritten proxy: children can chat to and confide in their new guide through the app like they would a friend, have them appear on their bed or the ward through augmented reality, and be reminded of upcoming appointments.

All this seemingly simple functionality requires a powerful back end of tools. Xploro's custom-built AI is the 'brains' of the character and can answer questions, understand sentiment and even tell jokes. It has also been built to interpret misspellings you'd expect from a child who might – for example – want to know about chemotherapy without necessarily being able to spell the word.

A mood diary and calendar of events to help children are also included to give the users control of their day. This part of the app can be managed via the parent or guardian, who also have a space to keep a journal. A clinician's management system allows for the customisation of some content, including the addition





of those events, and detailed analytics for monitoring patient feedback.

And when children get tired of talking, there are also games modelled on how the treatments are working to battle the cancer.

A trial of the app among children aged six to 16 was held at cancer care specialist hospital The Christie (see Emmie boxout, opposite page), which has since become Xploro's first paying customer. A research team at Edge Hill University – led by Lucy Gray, a Professor in Child Health Literacy and leading figure on the information needs of children going into hospital – determined that the app improves clinical results. The evaluation of 80 children, half of which had access to Xploro, found that access to it showed a statistically significant reduction in procedural anxiety.

"That's really important, because there's lots of research evidence that says that if you can reduce anxiety, then you can improve clinical outcomes," says Raban, who also highlights the anecdotal feedback received by the Xploro team.

When the mother of a nine-year-old girl being treated for the removal of a benign brain tumour got in touch, they readily provided her with access to the app. Within a few days the daughter was markedly less afraid and openly talking about going to hospital. "She was internalising all of her fears but, through familiarisation, she went from being terrified to actually talking about the experience.

"That sums up what we're trying to achieve. It's what success looks like."

The aim is for the app to be used by "a dozen or so NHS trusts". "We'll then use that as a reputational door opener for the European and US markets," Raban adds (see international boxout, p52).

The key to the UK market, he says, is for clinicians to become aware of Xploro and make a case for it to the hospital's own charity, rather than seeking NHS funds. "Finding the money to pay for the software can become quite a protracted process," he qualifies.



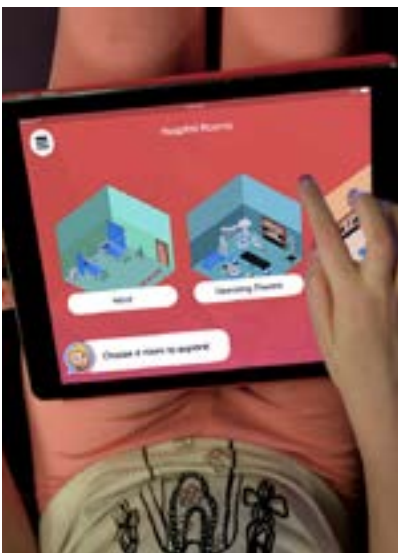
MEET EMMIE, 11 – AN XPLORO EXPERT

EMMIE IS PART OF XPLORO'S EXPERT ADVISOR GROUP, WHICH TESTS THE APP AT THE CHRISTIE



The firm plans to broaden its content to include people coming into hospital for basic procedures. Over the next year to 18 months, it will work with clinical partners to develop content for diabetes, respiratory illness and mental health: "Once we've done that, we want to develop versions for other age groups. Developing that content for adults is actually quite simple, in terms of the differences we'd need to make. It's more of a change to the user interface than the whole structure of the app."

Around 25 million people in the UK reported high levels of anxiety during March due to the COVID-19 pandemic, according to the Office for National Statistics. Should another coronavirus wave sweep the planet, the app would be well-placed to help reduce this.



Emmie has been lending her experience of hospitals and treatments to the company for two years.

"It is very scary," she tells BusinessCloud of entering hospital as a young patient. "I didn't know what was going on, so for other children the app can help you see what is going to happen with different machinery. There were different procedures I didn't know, which I know now because of the app."

Emmie is a gamer and keen user of Roblox, an online platform where people can design their own games and play those created by others. She says Xploro is better than her other games because the content is all free to use. "There are some games that use coins, but Xploro is free so you can customise the characters however you want."

Mum Eve says her daughter enjoyed making a character which didn't look exactly like her, and that the design choices of the character were a good way to strike up a conversation with new friends in the same hospital bay. "You can use the app to become friends with new people in your bay, because they are all playing the same game," Eve says.

Emmie adds: "If you have a favourite nurse you can put in their name and customise [the character] to look like them."

She says her friends can also use the app to get a better idea of what she has been through. That ability to communicate the experience in new ways extends to Emmie and Eve's relationship too.

"As a parent, the app gives lots of opportunity to talk with Emmie about what might be happening at the hospital," she says. And when Emmie wants questions answered privately, the chatbot is there as a safe space accessible only to her.

The diary and mood journal, while a useful space to express feelings, also keeps a record of her progress. "She might feel quite unwell one day, but by the time we'd gone to see the consultant, she'd feel fine," says Eve, who explains that the consultant can use that mood journal data to build a better picture of her progress.

Emmie is still on the advisory group, and is brimming with ideas for new features – including adding VR and being able to take on the role of a doctor or nurse in the simulation.





"There's definitely a role for Xploro to play in explaining 'what is a virus?' and 'how do you treat it?'" says Raban. "We haven't got that content, but were something like this to happen again in future, I could see Xploro playing an important part in reducing anxiety."

Raban has also had conversations with eager users who want the app to work for treatments outside of hospital, for example at home or in school.

"The long-term goal is any age, any condition, anywhere in the world."



XPLORO'S INTERNATIONAL CHALLENGE

A SPANISH-LANGUAGE VERSION OF THE APP IS BEING TESTED IN BARCELONA – BUT THE END-GOAL IS TO PENETRATE THE US MARKET



This means that the current 3D model of a ward in Xploro's app (left) was confusing to its Spanish users. "That's just one minor example of the cultural differences which need to change."

Raban, who acknowledges the ambition of attempting to get into multiple countries at once, says the US – a market where 13 per cent of people

speak Spanish as a first language – is the biggest fish it is looking to catch. "The States has always been a really important market to us. We spent quite a lot of time reworking the software last year so that it can be localised easily," he says.

A planned trip to the US, curtailed by coronavirus, formed part of the firm's conversations with the US National Cancer Institute. Together they are detailing potential work with a number of US hospitals.

Raban admits that COVID-19 has left "everything up in the air at the moment" but sees the first year's sales coming from the UK, followed by 60% of sales coming from the US in 2021.

The challenge facing Xploro if it is to achieve global success is to weed out the cultural differences around healthcare.

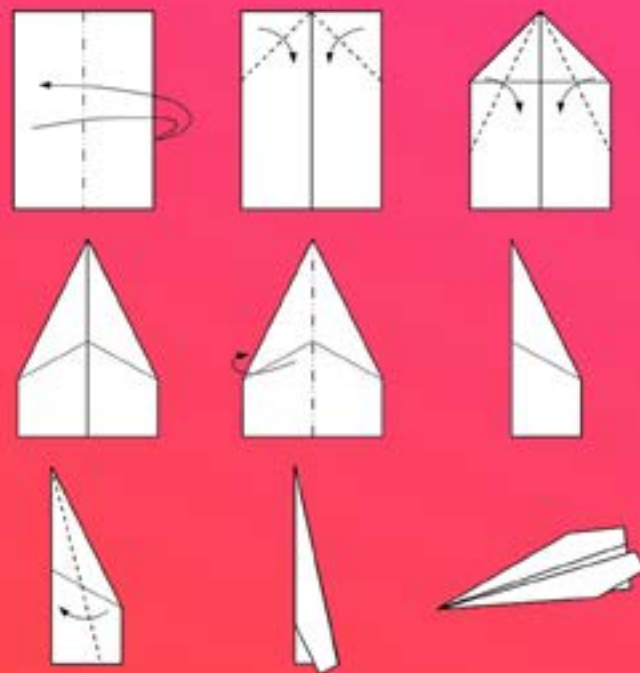
The firm is currently working with Hospital Sant Joan de Déu in Barcelona, a teaching hospital specialising in the fields of paediatrics, gynaecology and obstetrics, to develop and test the Spanish-language version.

Raban is working to get new patient user groups to evaluate the app. "Last year we were successful in getting some European money to help us produce a Spanish language version of Xploro," he says. "One of the things we noticed is that they don't really have wards. Most patients are treated in their own rooms."

The sales process, he says, is entirely different to that of the UK. "People tend to think of the NHS as a single body. In fact, each NHS trust operates completely differently from the next. One thing which unites them is a really complex digital procurement system.

"Rightly or wrongly – and emotionally I think wrongly, but as business person rightly – selling in the UK is quite difficult, whereas in the States you're dealing with hospitals that are operating more like conventional businesses."





At Campfire we specialise in creating memorable and engaging experiences for your customers on social media. Like the time we created a number one global Twitter Trend on Black Friday... want to know how we did it?

*Just
Scan This*



In the meantime, share this message the way our ancestors did before social media existed, turn this page into a perfect paper airplane, and toss it as far as you can. You'll find some instructions above.



MISSGUIDED

MYPROTEIN



THE INKEY LIST

sky atlantic

now TV

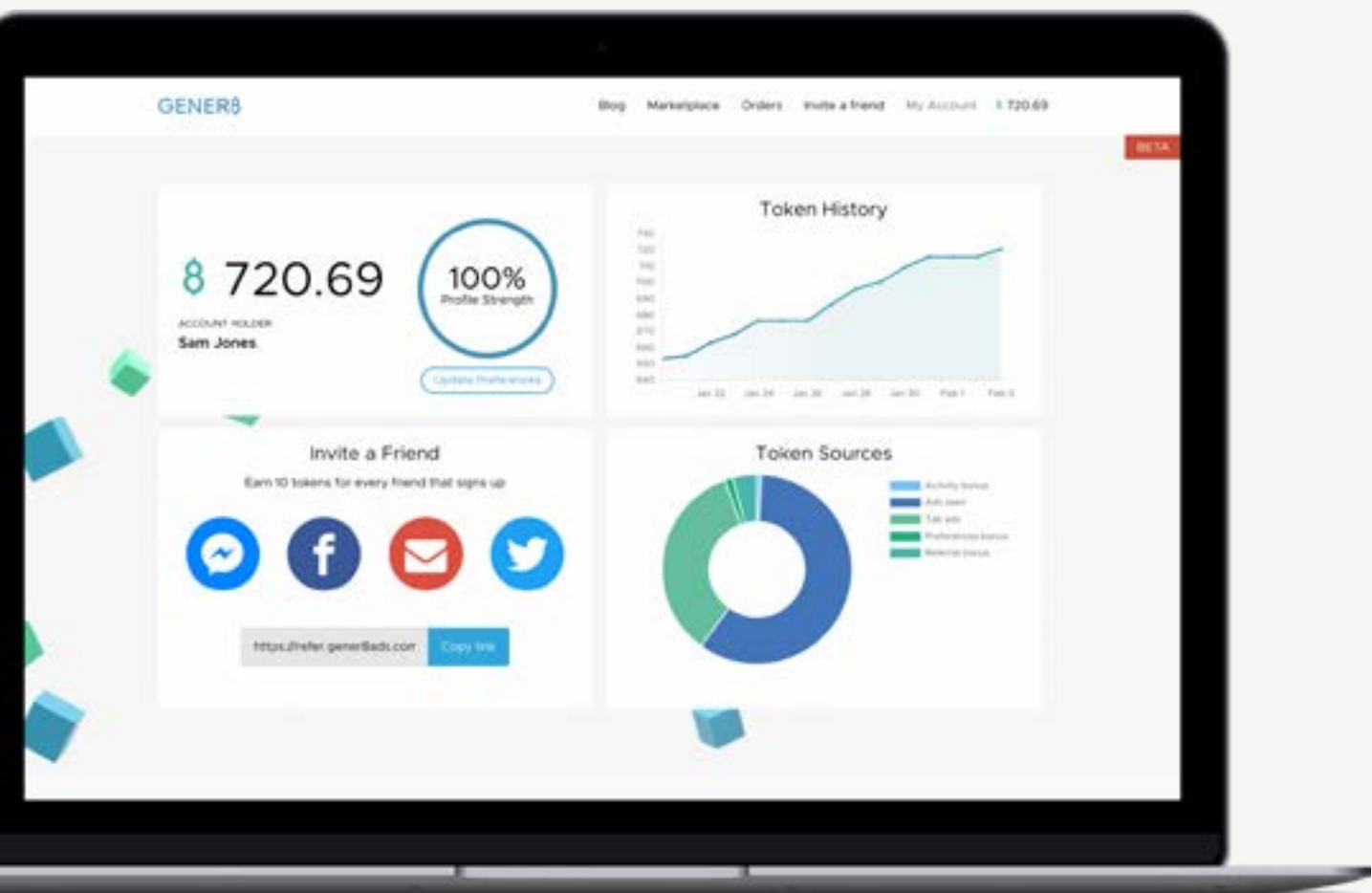
xln

Archies

TAKE CONTROL OF YOUR DATA

THE INTERNET HOLDS A RANGE OF INFORMATION WHICH CAN IDENTIFY US – FROM PERSONAL DETAILS TO THE CHOICES WE MAKE ONLINE.

BUT DO WE KNOW THE EXTENT TO WHICH WE ARE TRACKED? AND SHOULD WE BE KEEPING A TIGHTER REIN ON THIS VALUABLE COMMODITY?



WORDS:
JENNY BROOKFIELD

DATA CREATORS SHOULD ALSO PROFIT

Every click you make online generates a piece of data specific to you. Every choice you make is tracked by companies you've probably never even heard of, with the information generated sold on.

The moves we make online become part of our digital fingerprint – and companies are making money from this.

As an example, Enfield Council in North London allows 25 different companies to collect your information when you visit its website – seven of which are data brokers, whose business is selling your data. The result visible to us is tailored adverts – which we're all familiar with – but it is someone else who is making money from the fact that you've seen a particular ad.

London-based Sam Jones (below) believes this scenario needs to change. He founded Gener8 to enable individuals to become the ones making money from their data.

Gener8 Ads is a browser extension that enables you to control and earn from your own data (left). It tailors the ads you see online, blocks third-party trackers and anonymises your data, if you wish, to be used for custom research. Gener8 Tabs is a browser extension that allows the user to earn every time they open a new tab and Gener8 Sentinel helps you see if your data has been breached.

Jones has also launched the Digital Data Dividend petition, calling on the Secretary of State for Digital, Culture, Media and Sport to table

a legislative motion that ensures UK citizens can share in the wealth created when companies process and sell their personal data.

"Everyone has a different perspective on data and I'm not saying that your data being out there is good or bad, but I believe people should have the choice," Jones, who spent seven years on the global marketing team for Red Bull, tells BusinessCloud. "If a person's data is being monitored and sold then they should have the right to share in the wealth."

Jones says to hide your online actions is currently a complicated process. "Right now, if you used the world's largest search engine and you wanted to opt out of your data being tracked, it would take you 17 clicks to do so. The average person doesn't have the time to do that."

Explaining how it works, he takes the example of the council website. "If I went to that website and clicked on the option for disability services, then they'd sell my data to a business

concerned with disabled people's services. It's absolutely mind-blowing – and similar things are happening across the majority of websites."

Gener8, which is a passive service, has 75,000 users in the UK – a figure growing by 10,000 every month – and says they earn £5-25 a month. Jones is aiming for a million users by the end of 2020.

ALL DATA CAN BE USED AGAINST YOU

Gal Ringel, co-founder of Israel-based Mine, turns the questions on me during our interview – "as an EU citizen, have you ever exercised your GDPR rights and would you know how to do that?"

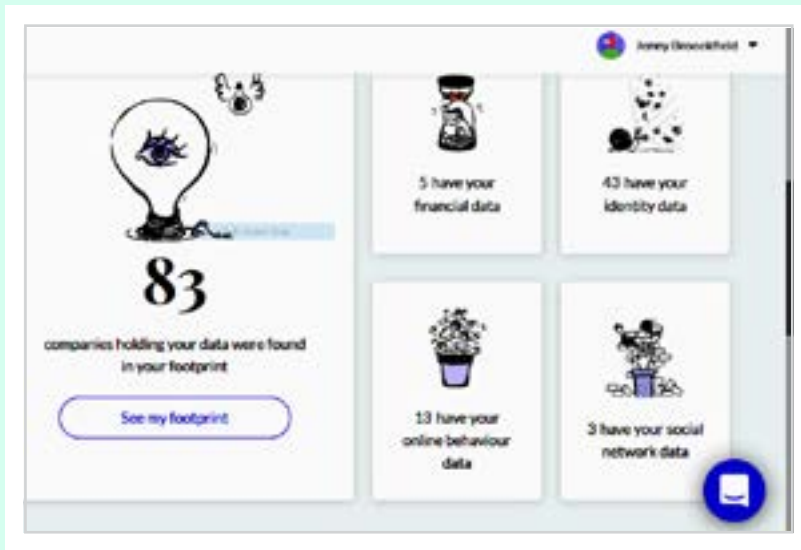
The answer is no – and it's a common problem Ringel and his two fellow founders, who met while working in Israel's military intelligence services, are aiming to solve with their tech business.

While working in their country's equivalent to MI5, the trio dealt with personal data and saw how easy it is for this to be exploited. "GDPR regulations are highly complex for the average person, but it's important for people to understand their personal data and be able to control it," says Ringel.

The result is Mine, which works by scanning a user's email inbox using AI to discover which businesses hold their personal data in just minutes. Once your digital footprint has been produced, you can allow Mine to instruct that business as to whether you want them to stop holding your details with just one click of the mouse.



MINE CASE STUDIES



GUY REDWOOD, MD OF LEEDS-BASED BEHAVIOURAL RESEARCH CONSULTANCY SIMPLEUSABILITY

To control who holds my data, I have a separate email account which I use to sign up for free public Wi-Fi and some paywall registration systems. I also try to block cookies on websites.

I know that companies track me reading emails by embedding images, so I have images in emails switched off by default. If I want to visit a link in an email, I'll usually go to Google and try to find the content directly – again so they can't track what I'm interested in.

Mine brought up 12 companies holding my data and that was on an email account I've been using for 20 years. I thought it would have been more – and they were all companies that I have engaged with and agreed to them storing info.

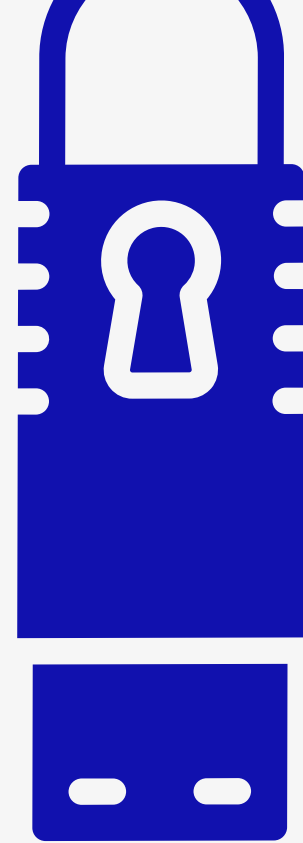


JENNY BROOKFIELD, FREELANCE JOURNALIST (ME!)

I'm lax when it comes to my data. I'm useless at remembering passwords and pins, so I'd much rather this kind of information be stored for easiness.

I'm also probably far too quick to assume it won't happen to me, so I'll (wrongly) not worry about the implications of a data breach. The Mine scan came up with 83 companies holding my data on an inbox I've had for more than a decade.

When I scrolled down the list, I spotted some companies I've used for one-off purchases, so they were the first to go. I'll probably keep checking back now that I'm aware of it – and look at using a password manager.



A person's footprint grows by an average of eight companies per month, making it highly dynamic in the modern connected world. Ringel spoke to us not long after the UK had gone into lockdown and warned that the coronavirus situation would see these figures grow even more.

The dependency on technology tools while in isolation for online shopping, home working and entertainment means people were increasing their digital footprint by more than 50 per cent.

But why does this matter? "All data can be used against you in any way, whether it's ID theft, reputational damage, financial loss or manipulation – that's any data that's related to you as an individual, whether it's your full name, home address, date of birth or financial information," he says.

A lot of what we do online can be a one-off, he says, for example purchasing a gift from an online retailer. If that retailer is hacked, the details they have from the purchase you made then fall into the wrong hands.

"British Airways was breached last year and we find that for every user there are 12 data breaches they weren't aware of," Ringel adds, adding that the business has had 40,000 sign-ups who have made more than 250,000 'right to be forgotten' requests since it launched in January 2020.

“PEOPLE ARE LAX AND TEND TO HAVE ONE PASSWORD THEY USE ALL OVER THE PLACE, BUT ONCE SOMEONE FINDS OUT ONE PIECE OF INFORMATION ABOUT YOU IT’S LIKELY THEY’LL BE ABLE TO GET INTO OTHER ASPECTS OF YOUR LIFE. IT’S THE SAME IN THE BUSINESS WORLD”

IS YOUR DATA PROTECTED?

The UK is behind markets like the US when it comes to cybersecurity, with the prevailing attitude of “it’s not going to happen to us”.

That’s the view of Perry McShane, sales manager of Leeds-based InsurTech business CPP Group, which helps businesses and individuals fight online identity theft.

“People are lax and tend to have one password they use all over the place, but once someone finds out one piece of information about you it’s likely

they’ll be able to get into other aspects of your life,” he says. “It’s the same in the business world. Small businesses don’t tend to buy cyber insurance because they assume it will happen to the bigger guys.”

McShane admits he had a similar mindset before joining the business and running Owl Detect, one of CPP’s products, which monitors data to combat online identity theft. For a monthly subscription, users can enter debit or credit card numbers, bank account details, email addresses and phone numbers, passport details, national insurance number and driving licence number. The process runs a historical search of your data against a database of compromised personal data, collected for more than 10 years

from unsecure and illegal data trading sites. It then continuously scans the web, including illegal websites and the dark web, for consumer and business data that could be for sale or in use by cyber criminals. If a breach is found, the user gets an action plan on how to prevent it happening again. CPP’s second product, KYND, protects small businesses from cyberattacks, scanning their website and producing a traffic light system report listing all the cyber risk exposures in amber and red, and then offering security advice.

With some individuals, there could be a feeling that things will be fine because they’ll be insured if their credit card is used fraudulently – for example – but McShane warns that people should be more concerned about the loss of data that actually led to that cash being spent and the efforts to get it back.

In the US, most people have personal cyber insurance, but similar products launched here have failed to make a big impact because of people’s attitudes, he says. Similarly, businesses tend to think they are watertight.

Advice afterwards can include embedding a ‘honeypot profile’ into your customer database. If there’s ever an email from that customer, you’ll know there’s been a breach. “People and businesses are nine times more likely to be involved in a cyberattack than become the victim of a burglary, and yet while we’re happy to have appropriate buildings insurance, we don’t think about cyber protection,” he adds.





EDUCATE PEOPLE TO VALUE THEIR DATA

Better education is needed around data security to ensure people bring good practices from their home life into the workplace, and vice versa.

George Gerchow is chief security officer at San Francisco-based Sumo Logic, which manages vast volumes of data for companies like Adobe, airbnb and Pokemon. He is in charge of how the company manages processing data on behalf of customers, and must ensure it is compliant around keeping data private and secure.

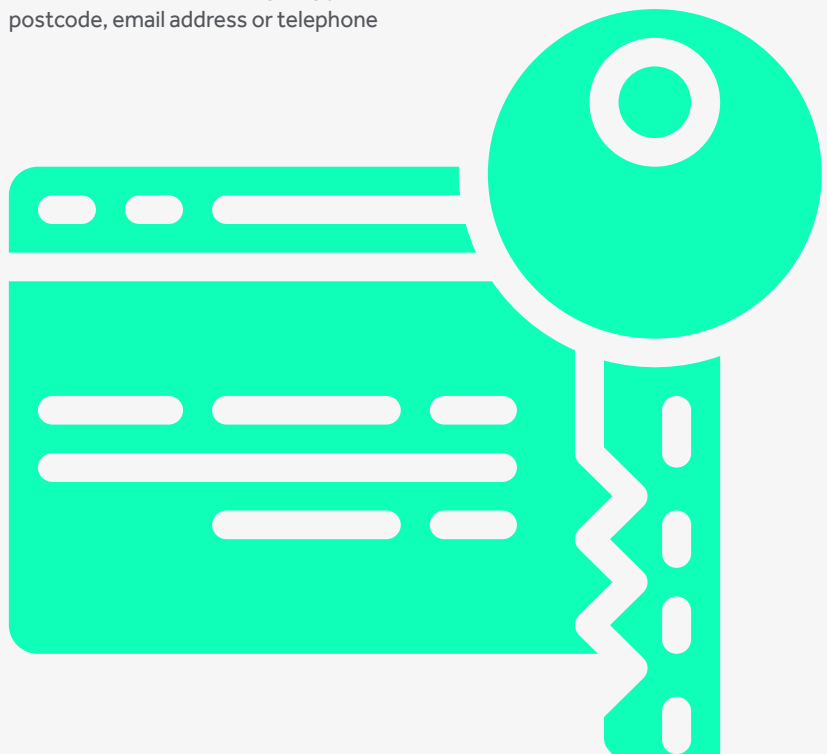
"With the amount of data people share about themselves on social media – celebrating birthdays, kids' names and pet names – I would have no problem working out someone's passwords," he says, adding that it can often be a generational problem. "A lot of younger people are willing to put everything out there, which puts them in a compromising position. People take these personal habits and bring them into the workplace with them, which is where businesses need to be careful."

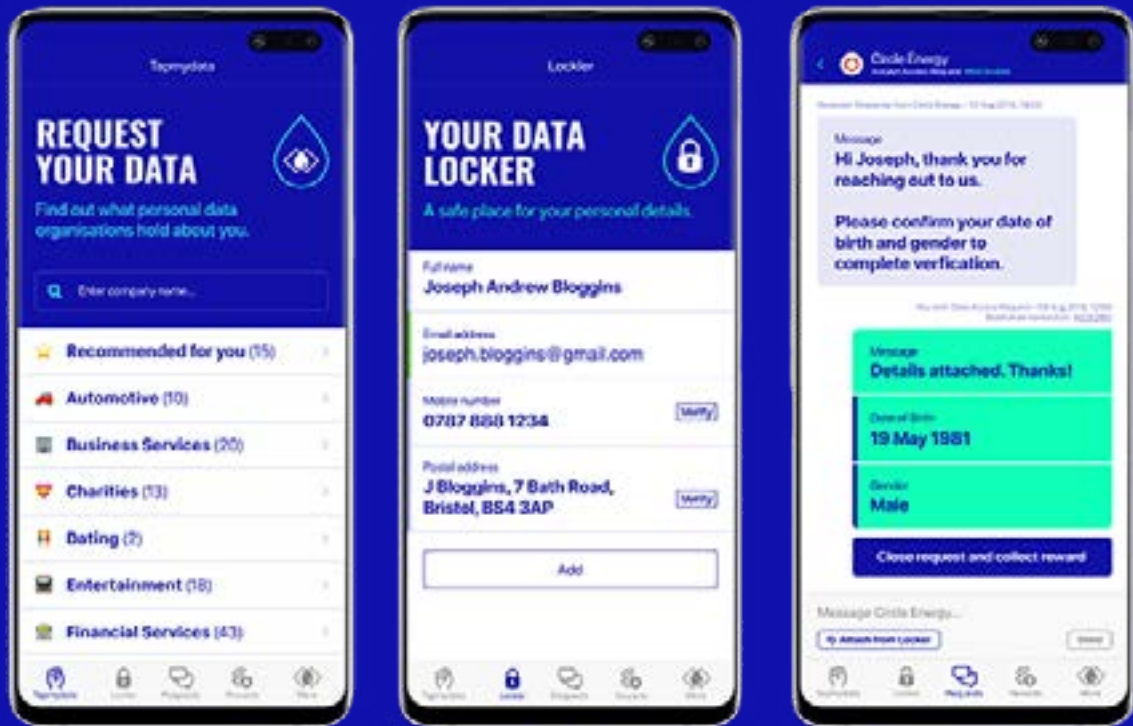
He gives the example of making a purchase from a shop and giving your postcode, email address or telephone

number at the desk for receipts to be sent to you or to join a loyalty scheme. Then there is sharing your location, posting pictures of a passport when you go on holiday or showing your driving licence when you pass your test. "People give up that information so easily so it's readily available, but hackers have no mercy and they'll go after a person's or business' identity no matter what the current climate is," he says.

Businesses need to make data a priority, starting with understanding what their sensitive data is before drawing up data handling and retention, and data encryption, policies.

"Employ best practices to safeguard your data," he says. "People aren't educated and that's where it starts so a combination of education and tools is a worthwhile investment. Businesses should consider employing a data protection officer who's responsible for awareness and handling of data along with policies around data. With that kind of education at work, your employees might transfer that knowledge to their own personal life."





SMART COMPANIES ARE HANDING BACK CONTROL

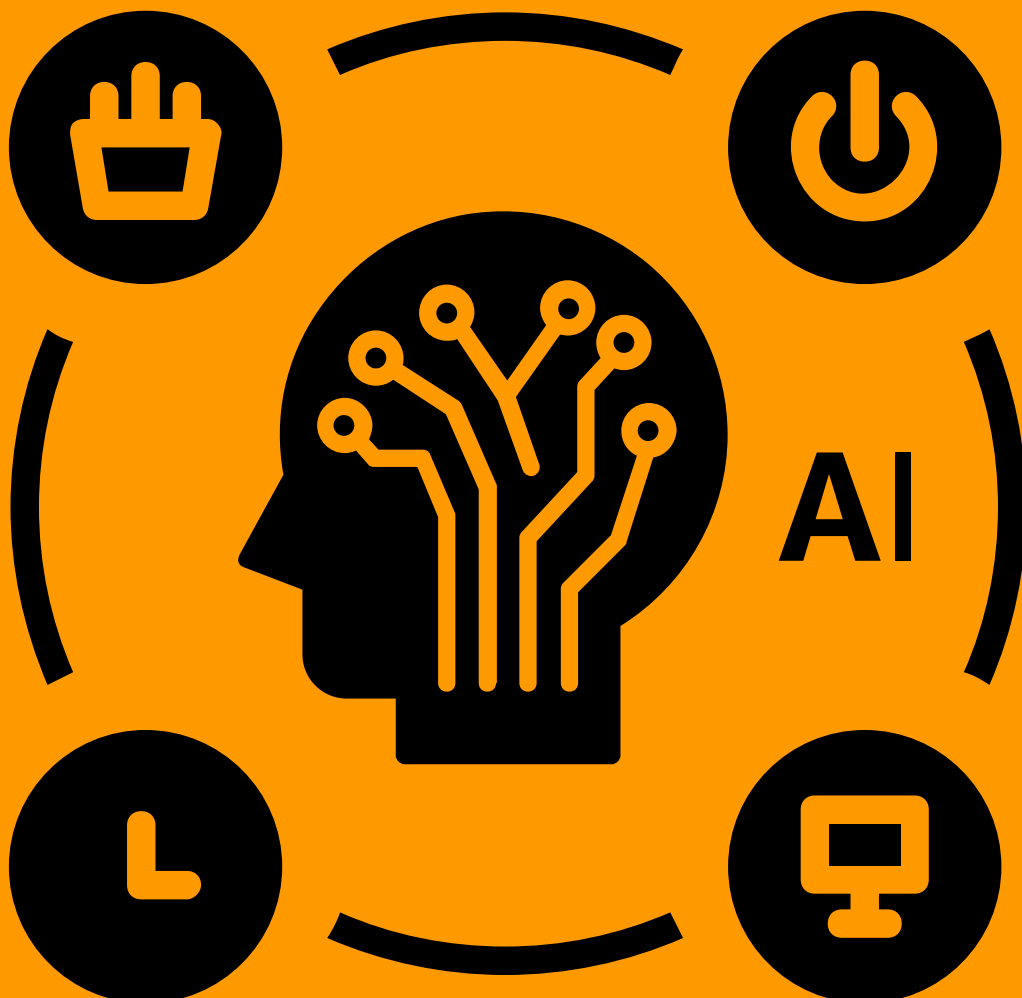
Bristol-based Tapmydata is a free app to enable people to discover what companies have their personal data, ask about it and keep it safely on their phone, along with their identity details. It's then up to them whether they choose to share some of their data with groups they trust (environment, voting rights, gambling aware), or to offer it up for sale, on their terms. Chief executive Gilbert Hill agrees consumers should have the right to benefit from their data and take better control over it.

"It's very difficult to value our data, as it's not clear what all the players and intermediaries make from it," he says. "Smart companies realise that people are concerned because they feel businesses get all the action in the data 'deal', and have lost control of their personal information. "Brands like IKEA are going beyond legal obligations, providing tools like preference centres for users and repatriating questions about data back from legal to the core areas of the businesses who know how to answer them as part of a customer dialogue. This may kickstart the ecosystem for people to really get agency (and cash) from their data."



The amazon conundrum

Amazon has become a synonym for buying online, but does its ease of use with sellers come with hidden pitfalls? Amazon sellers and eCommerce retail experts explain all



Words: Alistair Hardaker

Amazon is the largest eCommerce platform in the Western world. To its sellers, it's also a single point of access to the largest audience of buyers on the planet.

The tech giant offers entrepreneurs the chance to offload fulfilment, payment processing and even SEO to a single platform. And with all that tech taken care of, entrepreneurs can spend more time on their business and products.

But as Amazon's shadow grows larger over the eCommerce landscape, some online entrepreneurs feel the control of their selling has been surrendered rather than relinquished. If an online business wants to go-it-alone on the internet, is that still a viable business decision?

Is Amazon beneficial to business?

"It's a bit of an abusive relationship really," says Asif Mahmud, founder and director of Eruptive Brands, a product development start-up which monitors and researches items before refining them and adding them to one of its new or existing online brand ranges.

Eruptive Brands uses Amazon among other channels to sell its finished products, which are typically in the DIY and hardware sector. Mahmud says it

is difficult for a brand to maintain its newfound customer base away from Amazon after the initial boost.

"I think Amazon is the best place to launch a brand," he says. "The question is: how can we use Amazon and the fact that they've got a guaranteed search volume for a keyword which my product contains? How can we use Amazon and then take those products back off Amazon?"

Helen Davies, founder and MD of iKaboodle and its EasyTots and EasyPets brands, shares the sense of 'lock-in' to the platform. Davies entered the online entrepreneur space after completing an Amazon selling course in 2015, which she said cost thousands but whet her appetite for the potential of business growth.

The firm now sells a branded range of compactable plates and bowls. "I started the business as a side-line, and launched some products that were generic items that we labelled," she says. "It wasn't until a year later that we launched our own brand, and then I could see the potential. Amazon is responsible for allowing me a platform to get the business started, which I'm very grateful for."

The product was the first of its kind on Amazon, but Davies says the category quickly became more saturated with similar products. "The products that I launched had a lot of USPs and

there was nothing quite like it at the time... there is now. My share of the category was more significant. That's just something that I have to deal with by finding other sales channels."

Davies says having 'all her eggs in one basket' was "very, very scary. We started to diversify after that". She adds: "When we started, Amazon was 100% of our turnover and a few years later it had reduced to 70%. I'd like to get it to 50% and then I've got a balance."

Is fulfilment key to its appeal?

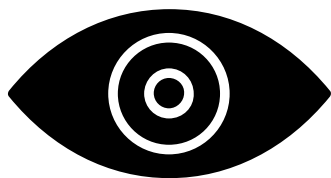
Cherelle Hunter is another Amazon seller, and the owner of the MAGconnexx brand, which sells magnetic building block toys to promote creative and STEM-inspired play. Her business model sees the toys sent directly from China to an Amazon warehouse where they are shipped to customers.

She says she used to sell her products on eBay but transitioned to Amazon in part because fulfilment was taken care of. Describing it as the 'Google of shopping', she was keen to build a presence on the platform. "I like that they send out the goods to the customer so I don't have to do that myself," she says. When a customer returns an item, Hunter says they are sent back to her business, or can be destroyed by Amazon.

While a proponent of the platform, Hunter says the returns policy can sometimes hurt a business. She also previously sold electrical items via Amazon and had customers return the wrong product – only for Amazon to refund the transaction. "The returns policy can be abused because Amazon is not seeing what people are returning before sending them back the money," she says.

Mahmud adds: "Once you give Amazon full control of the returning products,

"We've got to be looking at what they are doing next. Do Google really want driverless cars or do they want to create a new medium where a windscreen can be replaced by a screen and play stuff to a captive audience? The tech giants are not spending £10m a year for AI programmers just to build cars."



you lose the customer completely. The whole customer buying experience will be Amazon and you don't have a chance to capture any unhappy customers to put things right."

He says that the reviews of products on Amazon factor in shipping and returns, which is outside of the control of a business and provides no opportunity to interact. "Putting everything on Amazon and allowing them to in effect become your retailer could be a mistake."

What share of sales should be wired in to Amazon?

Guy Levine, founder and CEO of digital agency Return, says his firm has 47 clients on Amazon. "Every single one of them is doing whatever they can to reduce that [presence]," he says.

Mark Bennigsen, Service Development Director at Columbus UK, believes that whatever the share of sales a business decides to put on Amazon, it can't afford to ignore the platform. "It's got to be seen as a channel, and an important channel," he says.

"The question is where that channel fits in your larger strategy. You may have a market where you want to keep certain products out of that channel, or you may not. It's hard to say. But don't ignore it."

Columbus, which has its UK base in Nottingham, is a global IT services & consulting firm. Bennigsen adds that not all customers expect the simplicity of an Amazon transaction, particularly for larger purchases. "We have a client who offers expensive products and they have VIPs, who are very rich people and always buy the next bit of kit. It's a great business, but what they need is a really focused, perfect web portal experience which is going to tick all the boxes. You're not going to get that on a standard platform."

What are the alternatives?

Amazon's biggest competitor is Google – and more precisely Google Shopping. When shoppers search for items through Google, there is an opportunity to divert them from the default Amazon customer journey.

However Amazon has a hold on outcomes even within Google Shopping, reveals Katie Joyce of Bidnamic. The Leeds-based firm uses machine learning to boost performance on Google Shopping by refining listing.

Joyce says Google Shopping accounts for about 33 per cent of online shoppers' activity, and the only other major player is Amazon. But, she qualifies, "Amazon puts a lot of business through Google Shopping, which actually makes it a bit bigger".

"I would always tell my clients to sell on Amazon, but to be clever about it. A lot of my clients have different pricing on Amazon but Google Shopping is not price sensitive," she adds.

Joyce says detailed search queries, known as 'long tail', have more chance against the likes of Amazon. Her advice is that while it is sometimes more expensive to appear in Google Shopping results, the cost could have a more positive long-term effect on sales because visitors are taken to a company's own website. "You're getting so much more that way in terms of brand experience, customer service, and you've got all the data too," she says of the customised website experience.

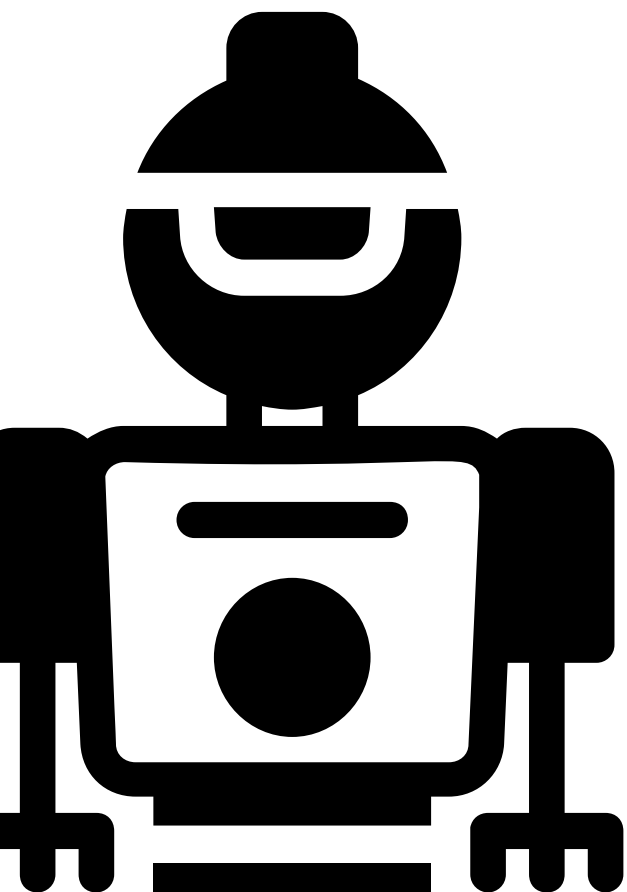
'Social commerce' is also maturing, says Harry Luscombe, commercial director of Mercarto Enterprise Technologies (MET). The marketplace technology firm offers a platform that integrates with retailers, brands, buying groups and enterprises.

Previously head of new business at social media agency Social Chain, Luscombe is well-suited to speak about the role of social channels in selling goods. "There's been an uplift in sales over the last five years via social channels and there has been a lot done on Facebook and Instagram," he says.

However he warns that social channels are not a one-stop-shop from advertisement to purchase. "As consumers we want to see reviews. It takes more than one ad to make us want to purchase. When you are a white-label good trying to sell on social commerce, you need reviews and standard processes in place rather than expecting that consumers will see one ad and buy a product."

Luscombe says that while brand trust could be created via reviews, brand recognition would ultimately win out, protecting a retailer from changes in platform.

On the still relatively new technology of voice-based commerce, Luscombe says the advice is the same. "You're not going to say you need toilet roll, but you might say 'send me some Andrex toilet roll'. The brand wins."



Is brand more important than platform?

Tony Madden, UK director of Mood Media, agrees. The firm provides in-store products such as digital signage, on-hold services, messaging music and even scent to elevate brand experiences.

On listing on Amazon, Madden says: "Keep the brand separate, and use Amazon as a channel. Look to Amazon for what they do well – innovation, user experience and customer service. Every time you're trying to make a decision as a brand, use that as your shopping list. So when you're about to make a business decision, ask if it's about customer service, or improvement.

"You lose your brand if you go all in on one channel - that's the one thing at the moment that keeps you safe."

Does Amazon have a masterplan?

On preparing for the next wave of changes in the eCommerce world, Levine says it is important to think big. "We're worried about Amazon, but they're not worried about us. Look at the investment they are putting into technology and AI. People used to say that Google AdWords would never be able to write themselves, but now Gmail now finishes off most sentences as you write them.

"The selling of products might just be a front for learning how to build scalable, secure technology solutions for understanding what users want. I think it's likely both.

"We've got to be looking at what they are doing next. Do Google really want driverless cars or do they want to create a new medium where a windscreen can be replaced by a screen and play stuff to a captive audience? The tech giants are not spending £10m a year for AI programmers just to build cars."



The Experts



Helen Davies,
MD, EasyTots/EasyPets/
iKaboodle products



Guy Levine,
CEO & founder,
Return.co



Tony Madden,
UK director,
Mood Media



Cherelle Hunter,
owner,
MAGconnexx



Katie Joyce,
Google Shopping
expert, Bidnamic



Asif Mahmud,
director, Eruptive
Brands



Mark Bennigsen,
service development
director, Columbus UK



Harry Luscombe,
commercial director,
Mercato Enterprise
Technologies

TURNING THE TIDE OF PLASTIC POLLUTION



TENS OF BILLIONS OF READY MEAL AND PLASTIC PRESERVATIVE PACKAGING GOES TO LANDFILL OR INCINERATION EVERY YEAR, DAMAGING THE ENVIRONMENT. WELSH ENTREPRENEUR PETER DAVIES BELIEVES HE HAS THE ANSWER WITH WALES TECH 50 WINNER BIOPAXIUM TECHNOLOGIES

Words: Jonathan Symcox

In 2017 Sir David Attenborough's Blue Planet II chronicled the devastating impact of plastics on ocean life.

The documentary series helped spark a war on the man-made material. In England a ban on plastic straws, stirrers and cotton buds is making its way through parliament, while in Wales single-use eating utensils and expanded polystyrene food and drinks containers are also set to be taken off the shelves.

Nevertheless a drastic increase in plastic production and waste is predicted in the coming years. "There are 360 million tonnes of new plastic produced every year. By 2050, that will be 1.2 billion," Welsh entrepreneur Peter Davies tells BusinessCloud. "If we don't do anything, it's only going to become more catastrophic as time goes by."

Davies is targeting a particularly damaging area of plastic waste with his start-up BioPaxium Technologies. Ready meals require mouldable black plastic trays which can contain more than one compartment and withstand high temperatures.

"There are seven billion ready meals purchased in Europe every year and that number is significantly growing," he says. "The UK is 3.5bn of that: it's a combination of us being a lazy nation and being too busy with our lifestyles. I

must have a ready meal myself at least once at least once a week – it's the convenience.

"When a black plastic tray goes into the waste system the ultraviolet can't detect the black carbon so it goes to one of two places: incineration or landfill. The big plastics companies have paid lip service to the market demand [for recyclable packaging] by changing the pigment colour to maroon or green, so that when it goes into the facility, it can be picked up and it can be recycled. That's great – but the fact of the matter is that globally only nine per cent of plastic is recycled anyway."

CIRCULAR ECONOMY

Indeed National Geographic reports that 79 per cent ends up in landfill with the other 12 per cent incinerated. Both have negative consequences for the planet, either polluting the land or releasing carcinogens into the atmosphere.

BioPaxium trays are manufactured using pulp fibres such as virgin wood, sugar cane bagasse, bamboo and wheat straw.



"We've got a product which, if it goes into incineration, is not going to give off bad toxins; and if it goes to landfill, will decompose and become compostable," explains Davies.

"But the clincher is that, once washed, it can also go into the waste paper stream. Ultimately, we want to educate the consumer to do that, because then it's back in the circular economy."

The product is also being developed for modified atmosphere packaging, used to enhance shelf life in vacuum-packed products such as chicken fillets. "That's the worst material out there. It can't be recycled and they have a very thick liner inside to give it the required barrier properties as well as a thick plastic film on top," says Davies. "That market is five or six times bigger than ready meals and we believe we can penetrate it."

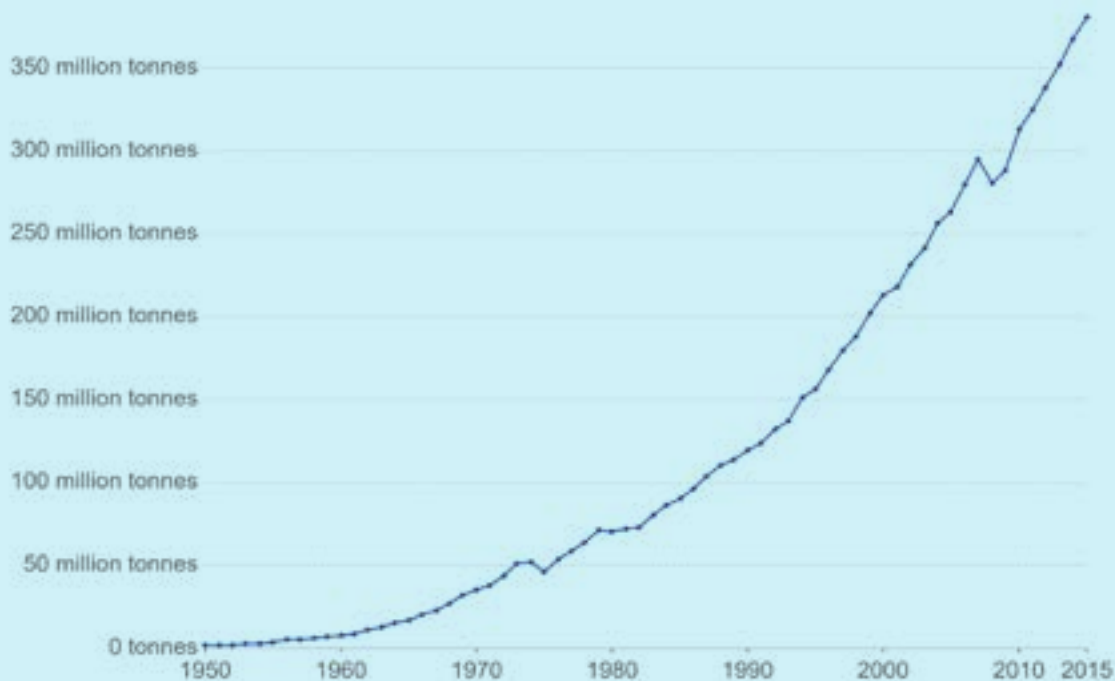
JOURNEY

It has been a personal 15-year journey which began when Davies' previous business ProcuraSell International Packaging won a £7m contract with Sainsbury's to convert 123m ready meal trays. "Unfortunately the product become commercially unviable when we started to make the changes to deliver on the technical requirements," he reveals. "That project failed – but my dream, my passion allowed me to keep focused on what I need to do."



Global plastics production, 1950 to 2015

Annual global polymer resin and fiber production (plastic production), measured in metric tonnes per year.



Source: Geyer et al. (2017)

A decade of extensive research into proprietary technologies throughout Europe and Asia followed before he set up BioPaxium, winner of this year's Wales Tech 50 ranking, in 2017. Crucially, the cost analysis now stacks up. "We can manufacture the product 30 per cent cheaper than any Chinese manufacturing. That's a big statement to make," asserts Davies. "It's down to the process as well as the product formulation because they work hand-in-hand to deliver the definitive product."

GLOBAL PLANS

BioPaxium is in talks with some of the largest ready meal manufacturers in the UK and Europe and is set to open its first manufacturing site in North Wales early next year. "We've got letters of intent and traction from Italy, Poland, America, Australia and New Zealand, as well as the UK," says Davies. "The first manufacturing base in North Wales will be the R&D centre and these other countries will license the technology so we can have more of a global impact."

"I recently went to a factory in Italy which is making big plastic water drums but can see a paradigm shift coming because of new laws and tax levies in that country. They want to get into an industry sector like ours to work alongside their existing business because there's an opportunity there to offset the business with carbon credits."

BioPaxium has partnered with a private equity firm and is in discussions with further investors after building out its tech with the help of a £500,000 Innovate UK grant. "I don't want an investor to come in and just see the pound signs – and potentially that would happen with a business like this because of the marketplace in which it's seen," says Davies. "We want someone with the right environmental ethos to live and breathe this and share our vision."

"I think the timing is right because single-use plastics are a very hot topic: people are becoming more aware of what really is happening out there... we want to be recognised as a global brand within the next five, six years."

Davies on topping Wales Tech 50

"I'm overwhelmed because it will allow me and the business to get out there and make a difference to our planet. I think we all need to be doing that at this moment in time."

"We're only going to scratch the surface of what needs to be done, but at least we will have that small impact."

"We're very proud. What BusinessCloud has done to increase the profile of new start-up companies has been incredible."

>> FAST FORWARD

FASTFORWARD TECH PODCAST

Do you lay awake at night fretting about how to grow your business? In uncertain times, more of us than ever are worried about the future. The FastForward podcast, from Tech Manchester, helps to change that by giving entrepreneurs like you the answers they need to take their business to the next level - helping you get a better night's sleep in the process. We call that a win-win!

Hosted by Tech Manchester's director Patricia Keating, FastForward shares the stories and expertise of business experts and founders at all stages of their business journey. It's crammed full of practical advice on how to take your startup to the next level.

Recent podcast highlights:



Episode 76: Angel Investment: Ask an Angel with Jenny Tooth OBE.

Jenny is CEO of the UK Business Angels Association, the trade body for angel and early-stage investing, representing more than 15,000 investors around the UK. She shares her advice around raising finance in the post-Covid-19 world, the loan schemes available to businesses and how angels can help startups.



Episode 78: Didsbury Gin: From Spirits to Hand Sanitizer

Liam Manton co-founded Didsbury Gin in 2017. The company experienced meteoric growth and now, like many other businesses, is now carving a path through these exceptionally choppy waters. Liam discusses how the company's pivot, it's plans for global expansion and support available for businesses during the Covid-19 pandemic and beyond.



Episode 59: Software Engineer to Female Founder

Chi-chi Ekweozor is a social media marketer turned front-end developer, engineer and entrepreneur. She started Assenty in 2016 after witnessing first-hand the difficulty in prioritising questions submitted by audience members for conference speakers via SMS. Chi-chi shares her startup journey so far, the challenge of raising funding and shares the advice she has learned along the way.



The FastForward podcast is published every Tuesday on every major podcast platform. Listen and subscribe now, so that you don't miss an episode.

The FastForward podcast is part of Tech Manchester's range of services, delivered to support early-stage tech businesses in the North West. Find out more: www.techmanchester.co.uk

Why COVID-19 will flow US capital into Euro start-ups



Storm Ventures principal Pascale Diaine focuses on helping European start-ups scale in the US. She outlines why we might see an explosion of great new companies

We live in a scary time. The questions on the collective mind of investors and start-ups are: how will the current economic climate impact business growth? What does investing in a time of uncertainty look like? Should start-ups anticipate a curbing of investment activity?

On the flipside, I believe that the current crisis will play in favour of an acceleration of capital deployed by US funds into Europe and the UK, as the VC industry will have to adjust to the new norms the virus is dictating.

The movement of US capital towards European start-ups isn't new. US funds have been looking to the European ecosystem to fund promising start-ups for a while now because of fierce competition for B2B investments in the US, sky-high valuations and the

relentless war for talent. I believe that three main reasons will drive even more US investors to pay attention to the Old Continent.

This is the first roller coaster for new funds

Many European funds are in a scary position. Many of them have popped up in the past five years, and COVID-19 is the first major crisis that they have ever had to face. In comparison, VC activity in the US has weathered many storms in recent decades, including the downturns of 2001 and 2008.

While many European VC firms may begin to slow or freeze funds, US VCs know that this is a time of opportunity and may decide to finance promising start-ups struggling to raise capital in their local market. This is also why we have seen some larger Bay Area funds raise 'opportunity funds' to take advantage of the situation about to unfold.

Cheaper talent, longer runway

The long bull market we're coming out of has been dictating our focus on growth for investment decisions until now. In this new economy, cash is king and managing the burn is becoming equally, if not more, important; a start-up's runway has to be long enough so that companies can survive until the economy picks up, which may take up to 24 months.

European start-ups have a competitive edge thanks to their access to a tremendous pool of talent for a less expensive salary. US VCs are well aware and this will only increase their comfort in investing in European businesses.

Zoom makes location irrelevant

We have to be prepared for remote work to be the long-term new normal. VCs will need to build conviction in the future success of a business with limited face-to-face contact.

In pre-pandemic times, meeting a CEO in person was a key part of the diligence process so signing a cheque without meeting a team in real life will be a challenge. However, a trend towards Zoom calls will remove the friction caused by distance when investing in European start-ups from the US.

Previous downturns have produced some of the most successful businesses of the modern economy: both Uber and Airbnb were founded in the wake of the 2008 recession. There are currently thousands of entrepreneurs and engineers stuck at home with a lot of problems to solve, which can lead to great things.

We will most probably see an explosion of great companies in the UK, Europe and US alike; I believe this is an exciting time to be a VC.

 @pascale

 @stormventures

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 Q2 2020

1.	Travelport	£397m
2.	Octopus Energy	£300m
3.	boohoo	£197.7m
4.	Auto Trader	£186m
5.	Checkout.com	£121m
6.	Blue Prism	£100m
7.	Onfido	£80.3m
8.	Bought By Many	£78.4m
9.	On the Beach	£67.3m
10.	Privitar	£65m
11.	Monzo	£60m
12.	Mereo BioPharma	£55m
13.	Exscientia	£49m

14.	Sitryx	£48m
15.	Oxford Nanopore	£48.4m
16.	Global-e	£48.3m
17.	NodThera	£43.4m
18.	Starling Bank	£40m
19.	Fly Now Pay Later	£35m
20.	Bit Bio	£33.4m
21.	Gousto	£33m
22.	Decibel	£32.4m
23.	Glassbox	£32m
24.	Featurespace	£30m
25.	Perspectum	£28.9m

For an up-to-date reference, updated every weekday morning,
visit businesscloud.co.uk/investments

For the latest UK tech acquisitions, visit businesscloud.co.uk/deals
For the latest UK tech appointments, visit businesscloud.co.uk/appointments

A PRESCRIPTION FOR SUCCESS

PHARMACY2U DISPENSES A REPEAT PRESCRIPTION EVERY 1.5 SECONDS - ALL THANKS TO AUTOMATION. CEO MARK LIVINGSTONE SAYS IT CAN COEXIST WITH COMMUNITY PHARMACIES DESPITE PLANS TO GROW ITS CAPACITY TENFOLD

Words: Jonathan Symcox

Serial entrepreneur Mark Livingstone knows a thing or two about subscription businesses.

Livingstone was one of the founders and a former CEO at LOVEFiLM, the postal DVD service which also pioneered digital downloads of movies and streaming services.

"I was worldwide MD at LEGO – where I licensed the IP for Star Wars and Harry Potter – but decided to do something more entrepreneurial," he tells BusinessCloud of a pivotal moment 15 years ago. "I was pretty inspired by the model of Netflix in the US, and felt it was only a matter of time before Netflix came to Europe. I got some



backing and bought a company called 'DVDs on Tap' with Simon Morris.

"We rebranded the company LOVEFiLM and built a DVD subscription service, which effectively was a replica of what Netflix was in the US. We lived by the phrase 'plagiarise with pride': we would literally look at Netflix every day and adapt our user interface and our UX and branding and proposition to European eyes."

This approach saw them build the subscriber base from 5,000 to 250,000 by the time Livingstone left the business two and a half years later. It would eventually reach 1.5m and be sold to Amazon in 2011 for a reported £200m.

He was also one of the key early investors behind healthy snacking start-up Graze, which began when a colleague bemoaned the fact that there was nowhere to buy nutritious food near the office. Livingstone cites Graze as a perfect example of how a subscription business should work. "One person would get it in an office, put it on their desk – and before you knew it, everyone in the office would be subscribing."

The distinction between running a subscription business in the leisure industry and highly regulated medical sector would have been made brutally apparent when, around the time he joined Chemist Direct as CEO in 2015, rival Pharmacy2U

– founded by pharmacist Daniel Lee 16 years before – was fined £130,000 by the Information Commissioner's Office for selling the names and addresses of more than 21,000 patients without their consent.

Deputy commissioner David Smith stated at the time: "Patient confidentiality is drummed into pharmacists. It is inconceivable that a business in this sector could believe these actions were acceptable. Put simply, a reputable company has made a serious error of judgement." In issuing an apology for the incident, which saw the details bought by an Australian lottery company and a health supplements firm, then-



MD Lee stressed that "no medical information, email addresses or telephone numbers were sold".

The following year Leeds-based Pharmacy2U was merged with Midlands firm Chemist Direct, with Livingstone named CEO and Lee becoming superintendent pharmacist. The move created a business with 1.5 million customers to be served from a new £3.5m dispensing hub in West Yorkshire.

CLEAR LEADER

Fast-forward four years and – before COVID-19 hit – Pharmacy2U dispensed repeat prescriptions to a quarter of a million NHS and private patients every month, making it the clear leader in its field. With an astonishing 43 per cent of the UK population suffering from a chronic repeat condition, requiring a prescription, there are many more people to attract to the service through TV advertising and other marketing channels.

"What I saw was an industry that had been in bricks and mortar for the last 300 years and had gone through massive upstream innovation in the quality of drugs that were being prescribed – but the last mile of delivery hadn't changed," says Livingstone. "I thought: 'There's no difference between subscription and prescription'.

"The epiphany for me was that this is a massive market – and no one's been trying to change it for the better in 300 years."

Taking repeat prescriptions online has saved the NHS more than £7m since 2014, according to Pharmacy2U, as it is paid 38p less per item dispensed than the average high street pharmacy. "As we scale, the NHS pays us less to do exactly the same job as a community pharmacist would do on the high street. The reason for that is our cost structure is lower than any community pharmacist because we have a single location and we use technology to dispense," says Livingstone.

However in a modern world where bank branches and Post Offices are systematically closing on the high street, he is keen to stress that "we don't want to eat community pharmacies' lunch". Indeed pharmacists' expertise could help ease the burden on GPs when the world returns to relative normality following COVID-19 lockdown.

"Our belief is the role of the pharmacy on the high street is to provide services and one-to-one consultation for the community," Livingstone, speaking to BusinessCloud before the pandemic reached the UK, says. "We believe that we're part of the transition of them offering great services and helping triage GP surgeries."

"They do that brilliantly – and we would never be foolish enough to say we could do it any better. It's just how Amazon coexists with Waterstone's now."

Before she died last year, my bed-bound grandmother required an assortment of repeat medication but wasn't able to access the technology needed to manage her conditions. However Livingstone isn't concerned that the move online might exclude the older segment of the population. "For

every example that I can cite of your grandmother, who wasn't technically enabled and didn't have Wi-Fi, there are three or four who I can cite who are," he says. "I'm thinking of my mother, who unfortunately passed away the year before last."

"The most watched viewing machine in the house was not the television: it was her iPad. We do not ascribe to the belief that older generations are not technically enabled: if you give them applications that are of use to them, and you provide multi-channels of communication and access to your service, you'll win. We have a 100-seat call centre, we have Hotmail, live chat, SMS, post... you can access our service through almost any medium. But the lion's share comes through smartphones and our app."

As well as systemising the process, using robots to pick and dispense medication gives Pharmacy2U great clinical accuracy, according to Livingstone. "Automation touches all of our processes, even things that are manually picked – for example, we use a system called 'pick by light' where lights flash on to the tote where the drug you need is stored. There are no pure manual processes – everything is either automatic or semi-automatic."

Before COVID-19, Pharmacy2U dispensed more than 700,000 items of drug a month – every one and a half seconds of operation. In October the company will open a second facility in Leicester which will ultimately increase its capacity tenfold. "At scale it will be capable of dispensing close to seven million items of drug per month," says Livingstone.

"I believe that we can increase [in size] by 10 times quite easily. So has this company got unicorn potential? Absolutely."

PHARMACY2U IN NUMBERS

RAPID RISE OF ONLINE PHARMACY BEFORE COVID-19 HIT

20-30,000

Monthly customer growth

20X

Larger than closest UK competitor

700,000

Items of drug dispensed a month

350

Workforce

£57M

Total funding

£60.7M

Revenues in fiscal year to 2019

£16M

Losses in same period

MARK LIVINGSTONE PROFILE

1987-1994

Head of marketing/buying, Woolworths

1994-1997

Founder & MD, Telstar Electronic Games

1997-2004

Worldwide MD, LEGO

2004-2006

Co-Founder & CEO, LOVEFiLM

2008-2012

Co-founding investor & NED, Graze

2008-2015

CEO, Scoot business directory

2013

NED, Parcel2Go.com

2015

CEO, Chemist Direct

2016

CEO, Pharmacy2U (following merger)



SANCUS INSIGHTS

The future in how we shop, discover and engage on the high street.

✉ hello@sancusinsights.com

🌐 sancusinsights.com



SANCUS PLACES

PLACE-MAKER OR LOCAL AUTHORITY?

The end-to-end digital high street platform, bringing together everything your area has to offer.

#SupportLocal

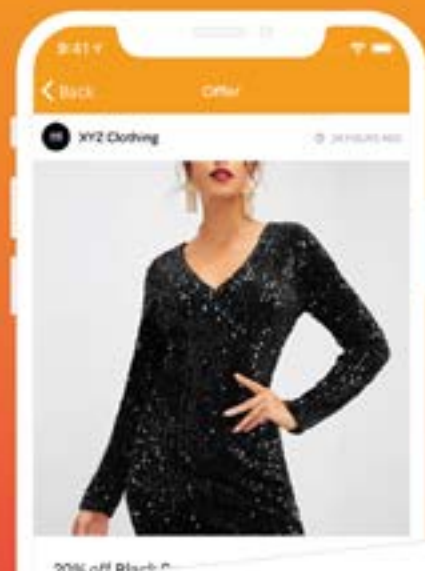


SANCUS BRANDS

BRAND OR ADVERTISER?

Reach the customers you desire and gain real-time insight into how, why, when and where people engage with your products.

#NewAgeMarketing



SANCUS LOYALTY

BRICK & MORTAR BUSINESS?

The real-world marketing, loyalty, insight and engagement platform. Merging online and offline to create the ultimate in-store experience.

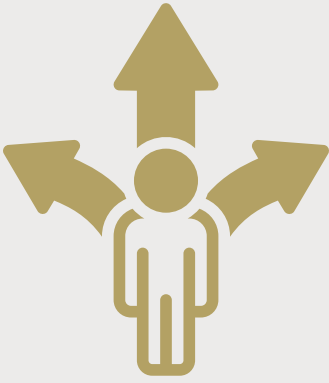
#TakeTheFightToOnline

SPAR GO



MyGMCR

Farinet
MORE AND MORE



THE ART OF THE PIVOT

HOW DID BUSINESSES REACT AS THE UK ENTERED LOCKDOWN? AND IN WHAT WAYS MUST THEY CHANGE GOING FORWARD?



Hilary Large, brand & marketing director, Forever Unique

"We listened to our customers. One of my colleagues created a Facebook group which has been invaluable in finding out what sort of content they want us to post, what type of products they want us to show them. That group will be involved going forward."



Stewart Reynolds, sales & marketing director, Shopblocks

"We quickly flipped our road map development to support the service industry more than ever before. We turned on eCommerce mode for restaurants, cafes and bars. We had about 150 sites sign up to start selling food and drink online."



Louisa Ziane, COO, Toast Ale

"COVID-19 has had a huge impact on the business. Toast Ale is stocked in retailers including Tesco, Waitrose, Co-op and Ocado, but orders became unpredictable so we relaunched our website with an improved webshop, offering free delivery."



Sean Brown, founder & CEO, Mercarto

"We considered how we could use our resources to help people struggling to buy fresh food online. Local producers were struggling with an unmanageable influx of demand so we created Mercarto Fresh to manage that demand and deliver direct to consumers."



Linda Ralph, VP of international business development, Mood Media

"We worked with UK supermarkets to ensure that all [digital signage] communications with the public were done with purpose and compassion, such as reinforcing social distancing. Consumers now expect brands to implement reassurances and safety guarantees."



Gary Rohloff, co-founder & MD, Laybuy

"Digital transformation should be a top priority for merchants - particularly the implementation of new payment models such as 'buy now, pay later' - if retailers are to survive and thrive over the coming weeks and months."



Aliyyah-Begum Nasser, director, Askham Village Community

"Our care home introduced Yapster, a secure instant messaging system designed specifically for deskless organisations. It's been invaluable in communicating with staff who are either working remotely or self-isolating."



Lorna Davidson, CEO, Redwigwam

"Business owners will be scared to take on overheads until they know things are certain again. We'll treat our employees differently and they will demand things from us. Those people that have embraced this will come out with bigger, stronger businesses in the end."



James Hyde, CEO, James and James

"Many businesses have had to rip up their operational rule book to ensure they survive. Much emphasis is being placed on business resilience, but leaders should not neglect their entrepreneurial spirit or lose sight of the benefits that can be realised from taking risks."



Kate Lewis, founder, e4enable

"I'd like to think that people will become more authentic. We've started welcoming people into our houses through Zoom calls - you can see my pets, my kids or my husband opening the fridge! I've seen sales people remove some of the gloss and be much more relaxed."



Tom Cotton, agile workspace technical director, Six Degrees

"Coronavirus prompted an acceleration in many organisations' cloud transformation efforts, as they ensured departments could carry on functioning with minimal disruption to clients. Many will not want to transition back to their old ways of working any time soon."



Simon Bull, sales operations & business development manager, Aqilla

"If anything, 'normal' as we once knew it will likely change forever. A cloud-based accounting solution will mean the finance department can work fully from home, if necessary, while being able to support increased agility with the latest company data."



The Zoom boom



Gavin Wheeldon explains how to jazz up your video conferencing - for both work meetings and the family quiz

It would be a vast understatement to say the world is a different place than when I wrote about CES 2020's top gadgets in the last edition of BusinessCloud.

Without dwelling on the many awful consequences of COVID-19, it is clear to see the impact it has had on tech, business and the consumer.

It has put an almighty rocket up the backside of many people and forced them to realise what is already available. My brother-in-law is director of an architecture practice and I've spoken with him many times about the ease of use and power of video for meetings.

Not long after lockdown was announced, I spoke with him -

on a video call - to find him rather excited about this new technology which allows you to speak on video, share your screen, draw on whiteboards and all sorts of other amazing things.

He, like millions of others around the world, had experienced a forced crash course in what has been available for many years - and the widespread adoption of this technology will change the world forever.

It saw Zoom go from 10 million to 200m users pretty much overnight and the other players have been racing to add functionality in an effort to win - or just keep up with each other.

This is obviously great for the technology. I also hope it will benefit the environment and people's work/life balance as we all finally realise that we don't need to hop on a train or a plane for a one-hour meeting - we can do so perfectly well from our sofa (or our long-forgotten office!)

I think video calls have been the biggest shift in technology usage over the past few months. I even get FaceTime calls now from friends who would have previously called in the old-fashioned way - and I'm sure you've all been subjected to many friends' meet-ups on video, and quizzes to boot.

Another positive is that we'll all come out of this as experts on flags, movies, geography and a host of other topics that will be of little use to us in future - except when we eventually head back to the pub for a quiz night!



So if we're all on video now, how can we enhance the experience and make it fun?

A selling point of Zoom is that you can appear by the beach, in the office or in other interesting places, while Microsoft Teams has a cool blur background so the passing kids or messy shelves aren't on show. Google Meet has neither of these, but is a great system.

Something that works with them all is Snap Camera, which you install on your PC/Mac and brings Snapchat Lenses to your streams - augmented reality at its finest.

It could be as simple as a background or blur; but if you're talking with friends or colleagues who like a laugh, you can go wacky and turn yourself into a baby, shrink your head or select another of hundreds of amusing effects.

Something else, which might seem obvious, is to turn your TV into a video conferencing unit so you don't have to crowd around your iPad/laptop for meetings or the family quiz.

Webcams were like toilet rolls in terms of scarcity a few weeks ago but are pretty much available now. Plug one into your laptop then attach your laptop to the TV via HDMI and hey presto - everyone is on the big screen and you can converse in comfort.

If you wanted to take it a step further and have a permanent web conferencing system, get a Mac Mini, Android box or cheap PC box - and you're away.

Enjoy the new normal - the era of the Zoom boom.

 @gavinwheeldon

CONNECT WITH UK TECH'S MOST ENGAGED AUDIENCE

BusinessCloud is the publication that gets to the heart of UK tech.

From our respected innovation rankings to virtual events, content and company profiles, we have an advertising opportunity for you.

Get in touch to discuss how we can promote your brand to our loyal readers.

Virtual events

- Sponsor our Zoom events with respected tech figures
- Join them in sponsored speaking slots
- Create your own bespoke virtual event

Company profiles

- Highlight business services and successes
- Drive leads to your website

Sponsored content

- Promote your services in our newsletter, website and magazine

Advertising

- Advertise in 14,000 magazines
- Put your business next to 120,000 web page views every month
- Reach our 3,500 newsletter subscribers

Rankings

- Help judge our respected innovation rankings
- Associate them with your brand, in the magazine and online
- 'Top 100s' in FinTech, eCommerce, SmartTech and HealthTech
- Tech 50 regional innovation rankings

Attack is the best form of defence

Cybercrime is on the rise

At Secarma we believe that all organisations should have the opportunity to do business with an understanding of the threats they face.

We understand that cybersecurity is a complex discipline and our approach is to guide an organisation through the process of securing their business with expert advice and education on best security practices.

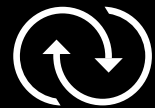
**Don't waste any more time.
Call our experts today on
0800 231 5977**



Penetration Testing



Red Teaming



Consultancy

 Secarma

 @Secarma

 @SecarmaLabs

secarma.com