SO

SPRING | SUMMER 2018

THE QUESTION OF THE DAY
Is necessity the mother of invention?

WHERE IN THE WORLD
The global reach of the park innovations

STRETCH YOUR LEGS
Taking the scenic route around the park

GAME ON

THE TECH BEHIND THE WORLD CUP

UNIVERSITY OF SOUTHAMPTON SCIENCE PARK

SCIENCE-PARK.CO.UK

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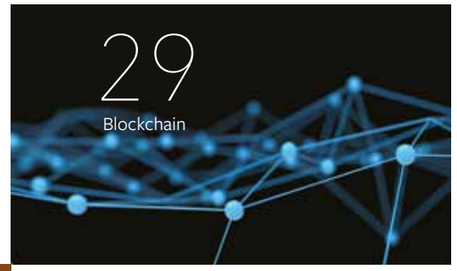

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Something to shout about?

If you'd like to contribute to the next issue of SO contact: parknews@science-park.co.uk

SO...

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Welcome to the first edition of **SO**

Many of you will be familiar with the University of Southampton Science Park, others may be less so.

It's a truly inspiring place to work. Here on the flourishing South Coast we continually strive to retain and build on our reputation as the region's centre of excellence for successful science and technology businesses. From start-up to scale-up to global impact, our role is to accommodate, equip, nurture and empower organisations to succeed; to help them see beyond today and shape tomorrow.

2018 will be another milestone year as we evolve our offering to reinforce our position as the home of game changers. Whilst enabling leader in life sciences, Promega, to build bespoke premises, we are also delighted to be expanding our own facilities. In the Autumn we will be unveiling a new Conference Suite: a place for greater numbers of people to connect, to create and to commercialise great ideas.

The incredible diversity of the technologies that are conceived and created here is surpassed only by the passion, drive and creativity of the great minds behind them. Underpin these with a collaborative entrepreneurial culture and an energising, stimulating location and there are no limits to the reach and impact of our work. To Infinity and Beyond will give you an idea of just how the Southampton Science Park community shapes society at large.

Whilst the success to date of our community of companies is impressive, let's not forget the critical role of new and small businesses to the UK economy. Our well-established programmes of support for early stage businesses – see Start-Up, Scale-Up and The game changer – bring new potential to the fore as we equip fresh entrepreneurial spirits for their business journeys ahead.

There's never a dull moment here: every day I am taken on a journey by visionaries who see the future differently. I hope that this new publication will serve to inform, inspire and open up opportunities for you too.

Peter Birkett
CEO, Southampton Science Park.
science-park.co.uk

what?

SO sees the future differently

SO connects

SO asks questions

SO engages, informs, inspires

SO celebrates success

SO shows how USSP shapes society

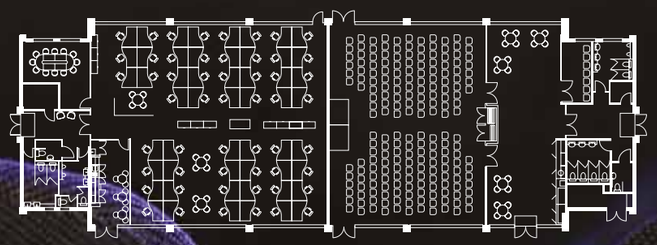
SO makes science and technology social

SO shines on South Coast excellence

SO where could it take you?

Axis the inspirational space

The University of Southampton Science Park Conference Suite



Proposed plan of the new Conference Suite

September 2018 will see the University of Southampton Science Park open the doors to Axis, its first dedicated Conference Suite.

Available to both resident and non-resident businesses, the new facility will provide an inspirational space to host large scale meetings, events and exhibitions with all the benefits that the Science Park already offers in terms of a welcoming environment, easy transport access, event and catering support.

The Axis Conference Suite will provide space which can be flexibly configured to create an auditorium for up to 200 delegates as well as exhibition and break-out areas. Additional car parking spaces are also being created for visitors.

The renovation of an existing building at 3 Venture Road to create the facility is taking place over the spring and summer months and will be carried out by the award winning local contractor Amiri.

> "I firmly believe that profitable growth and positive societal impacts derive from bringing people and their ideas together and giving them the space in which to thrive
>
> Peter Birkett, CEO, Southampton Science Park

Engage, Inspire, Empower

"I firmly believe that profitable growth and positive societal impacts derive from bringing people and their ideas together and giving them the space in which to thrive. We do this in many ways here, but we have long wished to provide an inspiring conference and exhibition facility which can enable this to happen at scale," said Peter Birkett, CEO of Southampton Science Park. "I hope that it will serve to engage, inspire and empower those who come here to the South's innovation centre of excellence."

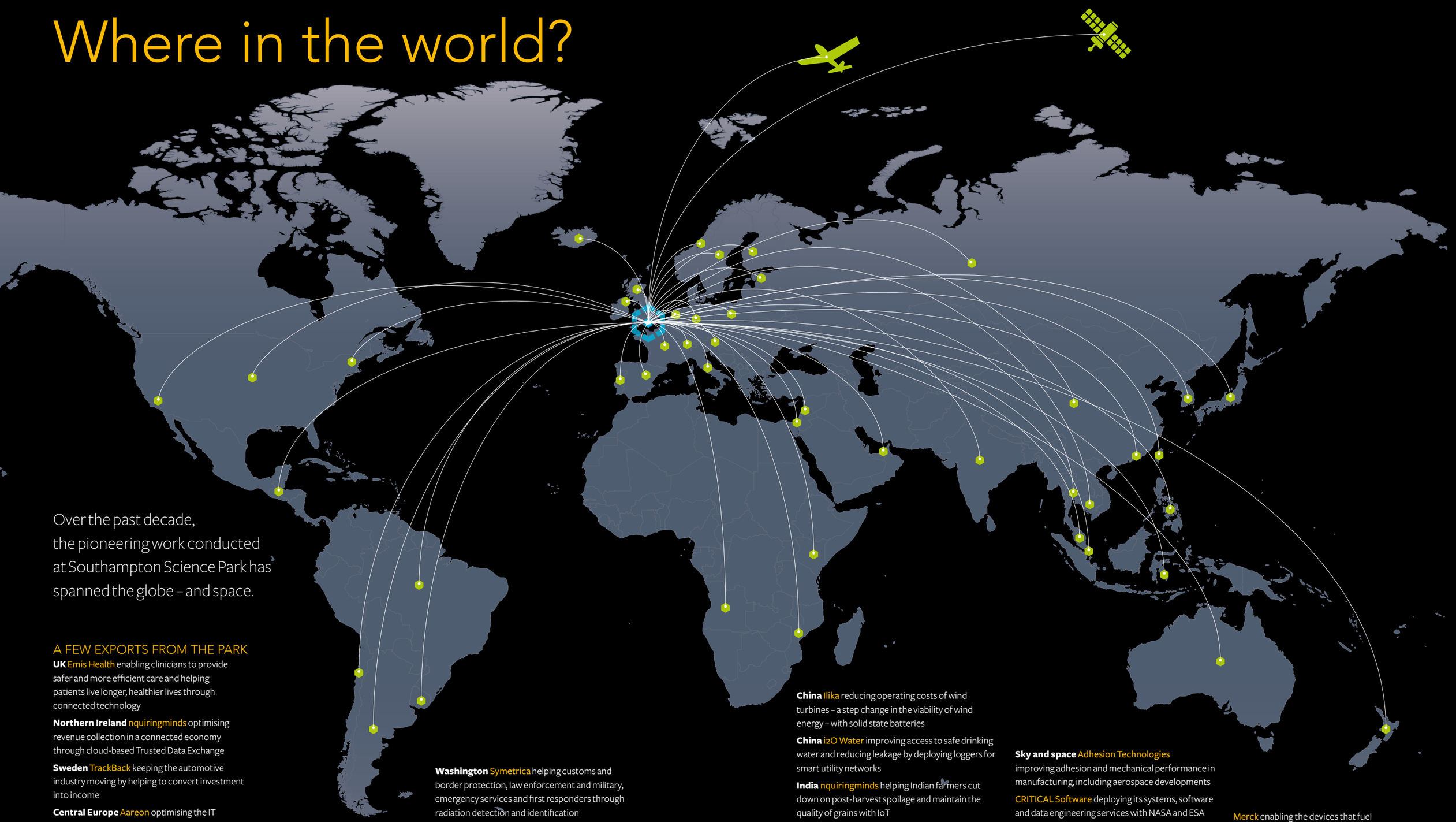
Bookings are now being taken for the Axis Conference Suite and enquiries are welcome. Please call 023 8076 7420 or contact enquiries@science-park.co.uk

Thought Leadership

The Science Park would like to offer businesses and organisations using the Conference Centre opportunities to hear from the visionaries based there. If you have an inspirational story or a unique perspective and enjoy public speaking, email the team with your ideas.

IMPACT

Where in the world?



Over the past decade, the pioneering work conducted at Southampton Science Park has spanned the globe – and space.

A FEW EXPORTS FROM THE PARK

UK Emis Health enabling clinicians to provide safer and more efficient care and helping patients live longer, healthier lives through connected technology

Northern Ireland nquiringminds optimising revenue collection in a connected economy through cloud-based Trusted Data Exchange

Sweden TrackBack keeping the automotive industry moving by helping to convert investment into income

Central Europe Aareon optimising the IT supported business processes of the residential and commercial property industry

South Africa and Kenya BluPoint delivering vital information and services to offline and off-grid remote communities using solar power

Central Africa CRITICAL Software developing solutions for a major telecoms provider

Washington Symetrica helping customs and border protection, law enforcement and military, emergency services and first responders through radiation detection and identification

Central USA Fresh Relevance maximising eCommerce revenues using data analysis and cloud technologies to trigger relevant customer engagement in the digital world

Cambodia BluPoint collaborating to develop digital tools to improve access to prosthetics and orthotics for amputees

China Ilika reducing operating costs of wind turbines – a step change in the viability of wind energy – with solid state batteries

China i2O Water improving access to safe drinking water and reducing leakage by deploying loggers for smart utility networks

India nquiringminds helping Indian farmers cut down on post-harvest spoilage and maintain the quality of grains with IoT

Russia Senseye removing maintenance chaos and uncertainty by transforming industrial condition monitoring with cloud-based predictive maintenance

Australia Perpetuum improving railway reliability and reducing maintenance costs with wireless sensors performing continual condition monitoring

Sky and space Adhesion Technologies improving adhesion and mechanical performance in manufacturing, including aerospace developments

CRITICAL Software deploying its systems, software and data engineering services with NASA and ESA

Tekever working on autonomous and brain-controlled flights

Everywhere Fibercore transforming IoT systems, autonomous vehicles, military and aerospace, telecommunications, utilities and general industrial sectors with its speciality optical fibers across six continents

Merck enabling the devices that fuel modern society with advanced electronic and optoelectronic performance materials

Promega providing innovative solutions and technical support to help scientists worldwide to advance their knowledge in genomics, proteomics, cellular analysis, drug discovery and human identification

IN THE HOT SEAT

SETsquared PARTNERSHIP
Universities of Bath, Bristol, Exeter, Southampton & Surrey

David Bream is a business mentor for the Science Park's Catalyst programme and a founder of the hugely successful SETsquared, recently ranked the world's leading university business incubator for its outstanding contribution to developing the next generation of UK tech entrepreneurs. With a background in technology and business development, he is no stranger to guiding businesses from start-up to global leader. Here, he gives us his insight into incubation.

"Incubation has become a bit of a buzzword of late. The government has set targets to push a specified number of businesses through incubation programmes – and everyone is jumping on the bandwagon to oblige.

In a way, this is positive because it has highlighted the need for public bodies, the investment community, universities and society as a whole to embrace and focus on entrepreneurship. (For some, this is still an alien concept – something that happens in Silicon Valley, not here in good old Blighty where success is an ugly word! But I can unequivocally say that there's an enormous amount of untapped entrepreneurial spirit right across the UK and it's not just centred around London, Oxford and Cambridge either.)

That said, I can't help but think that this numbers-based approach is misguided. Throwing enough mud at the wall and hoping some will stick is not the role of a business incubator. To me, incubation is about quality, not quantity. I don't mean to offend, but it should be deliberately elitist, picking the best of the best and really nurturing these into mature organisations, capable of taking on California – and winning. To do otherwise is a waste of strained resources and budgets.

As an early member of the team at Iona Technologies, a European start-up that grew successfully to be a $1bn float on NASDAQ, I experienced first-hand the scale-up journey. My role over the last decade and a half has been to champion others working to do the same. With very few resources and virtually no budget, we've witnessed some staggering success in that time. Symetrica, Primer Design, Utonomy and Redlux are particular highlights of mine.

So what makes these companies succeed when others do not? Is it about technology, timing or track record? Not at all. What makes a company more likely to attract venture capital backing and achieve high growth above any other is threefold: market opportunity, competitive advantage and execution. Let's take each of these in turn.

When I talk about market opportunity, I do so very precisely. I don't mean generically this target market or other; I mean explicitly: is there a large enough group of potential customers who have a significant enough problem that they need solving? Do we know these people well enough to be able to draw them and communicate our solution to them?

By competitive advantage, I'm talking about the specific point of difference that the product or service has. This doesn't mean that the technology or innovation is an out-of-this-world brand new concept, it just means better than the competition. Often the time, cost and resources required to bring something totally new to market can deter would-be investors. Solving a given problem faster, more efficiently, more economically, in a more socially responsible way – here is where real competitive advantage lies.

Finally, execution. I need to know that there is a viable management team in place, ready, willing and able to execute the business plan, turn the base technology into a viable product that the market needs, prove that the product or service is better than the rest and articulate this to the marketplace clearly and effectively.

Incubation is not complicated but it can deliver spectacular results. My own approach is to be excruciatingly robust in appraising businesses for incubation. I believe in brokering relationships with real experts to provide the highest quality advice and fostering a very respectful peer-to-peer collaborative culture from the outset. Above all, I rigorously police the details. It's the seemingly little things that can make big differences to customers and investors.

To conclude, it is my belief that incubation isn't the right route for all early stage businesses. Myriad other opportunities for coaching and funding exist that are likely to be more suitable for many – but incubation does play an incredibly important role for the few."
setsquared.co.uk

Grand Challenges

The UK's industrial strategy – Is your company aligned?

The UK Government's Industrial Strategy white paper sets out how it intends to build a Britain fit for the future by helping businesses create better, higher-paying jobs with investment in the skills, industries and infrastructure of the future. The government plans to use this strategy to build on the UK's strengths, address weaknesses and make more of its untapped potential. Centred on five foundations of productivity – ideas, people, infrastructure, business environment and places – it has been broadly welcomed by business leaders and commentators.

"There is world class R&D and innovation across the UK, from excellent research in university departments and public research organisations to investments from leading businesses. We need to capitalise on these strengths and foster the local ecosystems that can support innovation and sustained growth."

Four 'Grand Challenges' have been laid down in the areas that the government believes are set to transform industries and societies and in which it believes the UK has the opportunity to play a leading global role. To respond to the Grand Challenges, "business, academia, civil society and the government must work together, bringing their expertise and entrepreneurial spirit, to drive us all towards success" the white paper says.

40% of the UK's energy use is down to moving people and goods from place to place.

The four sectors of future strategic importance are detailed as:

- AI and Data – putting the UK at the forefront of the AI and data revolution. It is estimated that AI could add £232bn to the UK economy by 2030.
- Mobility – creating better ways for people, goods and services to move in the future. Currently around 40% of the UK's energy use is down to moving people and goods from place to place.
- Clean Growth – maximising advantages arising from the global shift to clean growth. It is estimated that the UK's clean economy could grow at four times the rate of GDP.
- Ageing Society – meeting the needs of an ageing society. One in three children born in the UK today can expect to live to 100 while globally, there are likely to be two billion people over the age of 60 by 2050.

"If the UK is to be the most innovative country in the world, we need to be able to capture the value from our science, research and creativity and support innovations that drive our productivity."

Innovation is at the heart of this initiative and there's budget being put behind it too, with a stated aim to raise R&D investment to 2.4% of GDP by 2027. There's also a new Industrial Strategy Challenge Fund of £725m and busines incentives in the form of an increase in the rate of R&D tax credits to 12%.

new Industrial Strategy Challenge Fund of £725m

Southampton Science Park and SETsquared company nquiringminds has been highlighted as a shining example of the industrial strategy in action, demonstrating a successful collaboration with the public sector. It cites work undertaken with Belfast City Council, where nquiringminds introduced its Trusted Data Exchange (TDX) to optimise the collection of business rates in the city. TDX is a cloud-based secure data platform designed with the connected economy in mind. Powered by artificial intelligence, it allows users to share data sets securely, in turn maximising the ability to analyse and generate actionable insight.

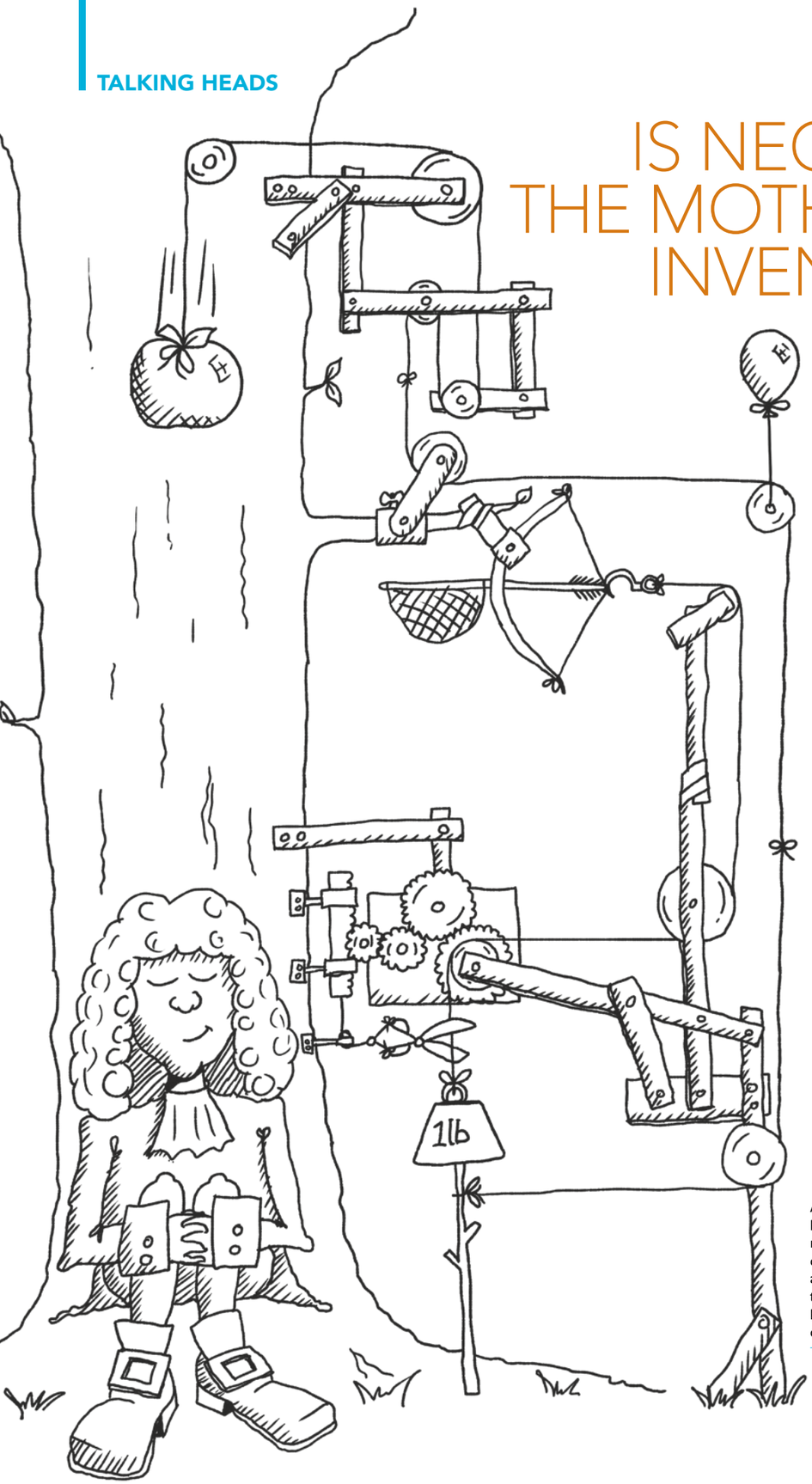
So, how can you get involved?
UK Research and Innovation came into being in April 2018 and is a good place to start. Operating across the whole of the UK with a combined budget of more than £6bn, it brings together the seven Research Councils, Innovate UK and a new organisation, Research England. **ukri.org**

"We face a time of unprecedented economic change, powered by new technology. Now is the time for the United Kingdom to ensure we are well prepared to prosper."

Innovate UK has a £50m loans pilot scheme which aims to provide affordable, flexible and patient finance for later-stage R&D with a clear route to commercial success in businesses seeking to scale and grow. **gov.uk/government/organisations/innovate-uk**

The Government's funding programme for the implementation of the industrial strategy offers various opportunities for businesses to apply until 2019. Keep informed at: **gov.uk/government/collections/industrial-strategy-challenge-fund-joint-research-and-innovation**

IS NECESSITY THE MOTHER OF INVENTION?



After being woken several times by falling apples, Isaac found it necessary to invent the apple catching machine. It wasn't until a major malfunction, resulting in the necessity for a new wig, that he had a brilliant insight... sit under a different tree.

Three seasoned entrepreneurs contemplate the **question of the day**

Mike Austin
Founder & CEO
Fresh Relevance

"There are lots of types of invention. Pure scientific research is often carried out entirely independently of need – and just for the purpose of enhancing knowledge, or to satisfy the curiosity of the research.

Some of the most valuable inventions come from necessity – or at least a very strong need. However, that's not to take away from pure scientific research, which is a noble aim in itself.

In industry, research normally has a more definite need in mind – often a particular need – i.e. "How do we solve this problem for customers?". Companies often also carry out development – not pure invention, but usually it involves breaking new ground – "How do we reduce these costs", "How can we extend our product to cover these new areas/applications?"

Finally, there is innovation in an entrepreneurial context. This involves new applications of knowledge to a market, and sometimes the creation of new knowledge. The entrepreneur identifies a market which they think is new or underserved, and is sufficiently large and valuable to sustain a new business. In this type of invention, the entrepreneur has a definite goal in mind, and seeks to create solutions to achieve that goal.

Some of the most valuable inventions come from necessity – or at least a very strong need. However, that's not to take away from pure scientific research, which is a noble aim in itself."

Shirin Dehghan
Entrepreneur &
Senior Partner, Frog Capital

"Before the car was invented, if you asked people what they wanted, they would have said faster horses that don't eat a lot of hay. Before the Apple iPhone, people lived without APPs.

In both of these cases it took a visionary to create what people needed but not necessarily what they wanted. Invention happens for many different reasons. It can certainly be because of necessity but it can also be because of human ambition, curiosity, and vision for how people should live. Greatest inventions and disruptions have occurred for all of these reasons and, once invented, then the technology becomes a necessity.

Invention happens for many different reasons. It can certainly be because of necessity but it can also be because of human ambition, curiosity, and vision for how people should live.

Before the invention of mobile phones or internet our society was functioning and we lived just fine, but now, having had the mobile phone and the internet, we simply cannot live without them. Were these a necessity? No. Are they necessities now? Yes."

Phil Sharpe
Catalyst Programme Business Coach
University of Southampton Science Park

"Yes! But it is only one of many important drivers.

For millennia, human endeavour has focussed on climbing from survival to Maslow's self-actualisation; honing intellect and creating industrial wealth in the process. The pursuit of laziness or doing things more efficiently has been a vital force and inventors now create myriads of new technologies and gadgets every year. Yet, political process remains stubbornly archaic and human survival increasingly depends on inventing better ways of balancing interests across burgeoning populations. Computer software may succeed where humans failed; mathematics versus emotion? Earth is a very small rock in a vast uncaring universe, to survive humans must now invent interstellar transport and harness the energy of the stars.

Not all inventions stem from problems, many spin out from research and academic ego – creating novelty – just because we can.

But not all inventions stem from problems, many spin out from research and academic ego – creating novelty – just because we can. Many start as solutions looking for problems: lasers, RFID, nanomaterials, 3D sound and the Internet of Things. But often it is only a matter of time and investment to build market need, to nuance and package the solution.

The necessity-led approach appears innate and its value is strongly advocated in business incubators like the Catalyst Centre but, as Apple and many others discovered, design-led need creation can also work. So, does serendipity."

What's your opinion? To feature in the next debate contact: parknews@the-escape.co.uk

The role of technology in a circular economy

Policy frameworks, consumer power and resource scarcity are colliding at speed to challenge the way the global business community works. Used to being at the forefront of disruption, how will science and technology companies adapt to the new economic world order?

Words Are Not Enough

As a growing population, higher life expectancy rates and rising affluence continue to place enormous stresses on the planet's natural resources, both consumers and policymakers are demanding more from business.

A recent global study by BBMG and GlobeScan suggested that trust in corporates is down and expectations are up. For the first time in nearly a decade, more consumers are punishing companies for their behaviour (28%) than are rewarding them (26%). Like never before, the world's consumers are turning to business leaders to address the social and environmental challenges that affect their aspirations for better lives.

Many businesses within the technology sphere, operating predominantly on a business-to-business footing, may feel that they are somewhat distanced from this consumer trend. However, people are more connected (and consumers more powerful) than ever before and this means that total supply chains are under scrutiny and ethical performance needs to be transparent. There is increasing popularity for companies to commit to science-based targets. At the same time, we are seeing strong signals from policymakers on a global level that words are no longer enough. The UN has published 17 Sustainable Development Goals,

90% of raw materials used in manufacturing become waste before the product leaves the factory while 80% of products made get thrown away within the first six months of their life

the EU has a Circular Economy Package and Scotland is leading the way in the UK with its forthcoming Circular Economy & Zero Waste Bill.

It's all pointing to a sense of irreversible momentum for a widespread departure from a linear 'take, make, dispose' economic model towards a circular, regenerative one.

Circular Thinking

A circular economy works to optimise resources (raw materials, products, energy and water) and keep them in productive loops for as long as possible. At its core are seven key principles:

1. Prioritising the use of renewable, reusable, non-toxic resources and applying these in an efficient way.
2. Using waste as a resource by effectively and intentionally designing out waste at the outset and considering secondary uses for any waste streams.
3. Designing for the future through extending product use and designing these in such a way that it could be easily dissembled and repurposed for re-use.
4. Preserving what's already made through effective maintenance, repair and upgrades to maximise a products lifespan, and, where possible, give them a second life through a 'take back' strategy.
5. Collaborating to create value and increase transparency throughout the supply chain and across sectors, recognising interdependence between the different market players.
6. Incorporating cloud-based and autonomous technologies to track and optimise resource use and provide insights to strengthen collaboration.
7. Rethinking the business model by considering the interaction between products and services. Is it necessary to actually own a product or is leasing it just as good?

For investors, the economic, environmental and operational resilience benefits are clear but more than that, a circular economy is a driver for value creation. For tech innovators, exciting challenges and opportunities are revealed. Some are already way ahead of the game.

Leading the Way

Consider, for example, the impact of i2O Water's work. The company is helping over 100 utilities in 30 countries to preserve water through its smart network solutions incorporating data loggers, system monitoring and advanced pressure management.

Meanwhile, Senseye's cloud-based predictive maintenance application is increasing the lifetime value of machinery throughout the manufacturing sector.

Perpetuum's self-powered wireless sensors are in use on railway networks on several continents, providing remote continual condition monitoring data to reduce operational and maintenance costs.

SEaB Energy's containerised anaerobic digestion units, which turn organic food waste into energy exactly at the point where the waste is produced and the energy is required, have been eyed with interest the world over.

UK businesses could save up to £23bn per year through implementing low cost or no cost improvements in efficient resource use

Utonomy's machine learning and cloud-based software is able to automatically optimise pressure across gas distribution networks, keeping it as low as possible while maintaining statutory minimums and reducing leakage: important because the impact of methane on global warming is 84 times greater than the impact of CO_2.

These excellent examples from Science Park companies past and present are the tip of the iceberg of the circular opportunity.

A predisposal to work with science-based metrics and the effective use of new data technologies – IoT, mobile apps, drones, machine learning and wireless connectivity for example – give tech businesses the edge when it comes to adapting to a circular economy.

More than any other, the technology sector has the capacity to disrupt the status quo, think creatively, inspire collaboration and create exciting clusters for truly integrated and scalable solutions to increasingly global problems.

Into the limelight, please step forward Ruby Lee and Alice Sleight, founders of Made & Worn, a start-up with grand designs on the future.

What first gave you the idea for Made & Worn?

Ruby: I remember very clearly: I was sitting on a train knitting a cardigan for my sister-in-law who was about to have a baby. I love to knit and I'm no stranger to conventional knitting patterns but I found myself constantly losing my way, unpicking and getting extremely frustrated! The whole knitting experience is often rather stressful because, at the end of all the effort, you never know if what you've created is actually going to fit. So I thought to myself: there has to be a better way – and I'm very determined when I find a problem that needs solving!

I'm an electronic engineer and a firm believer in human-centred design. I'm interested in exploring how people interact with technology, working to find intuitive, visual solutions that make complex things simple. It struck me that, if I could turn knitting instructions into code, I could create an app that would solve a multitude of problems.

Once I'd had the idea, I spent about a year – including six months at the Catalyst Centre – getting to know the market and understand the customers before heading off to the jungle for a month to get the headspace to consider whether it was really worth pursuing. Then I came back and jumped straight in!

Tell us more about the knitting market and the problems you're solving.

Ruby: The market is huge. One in ten people in the UK knit and in the US there are 39 million knitters – that's more people knitting than play golf! Russia too, is a massive opportunity, as is Scandinavia where crafting is a way of life, not a hobby. Imagine the UK's 6 million knitters in a factory setting, each creating up to 10 items a year, and you can get a sense of scale – it's a huge cottage manufacturing operation!

What draws all of these knitters together is the commonality of their experience: it's a curious mix of stress relief and joy on the one hand, and on the other frustration with the process and disappointment with the result.

Alice: I couldn't agree more. Having studied knitted textiles at the Royal College of Art I can safely say that there are no 'generic body' shapes so this really is a case of 'one size does not fit all'. The whole point of knitting is to create something that is beautifully individual: something that fits you perfectly, and something you wouldn't be able to find in any shop. So why not make it exactly as you want it to be?

I've been trained in design but many knitters do not feel brave enough to design their own garments – **Made & Worn** makes it possible for anyone to become a knitwear designer. The ability to use any material and customise classic shapes with preferred patterns gives everyone the opportunity to create an on-trend look or an investment piece that always looks good and feels great.

Made & Worn makes it possible for anyone to become a knitwear designer.

IN RESIDENCE

One in ten people in the UK knit and in the US there are 39 million knitters – that's more people knitting than play golf!

Ruby: Yes, **Made & Worn** puts the fun back into knitting! Our app takes a basic pattern and adapts it to the knitter's natural style and gauge, chosen yarn and the wearer's exact measurements so that they can be sure of the perfect fit. It also allows total customisation because it's possible to create any item in any style – we already have around 30,000 individual combinations!

Finally, and incredibly importantly, it allows knitters to track their progress so they never miss a line or lose their place. It's intuitive, visual and updates in real-time across multiple devices so, no matter where you are and whether you're working with phone, tablet or PC, the app knows exactly where you need to pick up again.

You have both come from different backgrounds: how do you collaborate effectively?

Alice: We bring different expertise to the company but we both like to solve problems and we're both creative – but we have different strategies to complete tasks. I like to have a firm brief to design to, whereas a brief ties Ruby down; she works more adaptively, creatively finding solutions to technical problems. As it's just the two of us at the moment we have to work leanly and we understand that reasonable compromises must be made to move forward. We've got our set roles and, now that we have a live product, we know we have developed a process that works.

You've just taken part in a business review panel: what did you take away from the experience?

Ruby: We've done two actually! The first one was incredibly nerve wracking but we both really enjoyed the second, one year on from the first. Preparing for it required us to take a step back and reflect on what we've achieved and what we need to do next: there was a real sense of momentum.

In a small business without a full management team, the range of experience and insight around the table was extremely valuable, although it was emphasised that ultimately, we need to take the decisions. We found it really reassuring because it demonstrated to us that all businesses are so individual that there isn't a pre-determined path to follow.

So what are your next steps going to be?

Ruby: So far we've bootstrapped the business, allowing us to grow at a rate that suited us. But, now that we have proved the concept with a live product that's generating income, we need to turn our attention to scaling: how much do we want to grow?

Alice: We also know that a level of personal development will be required as we will need to recruit, delegate to and manage a multi-disciplinary team moving forward – people with expertise that is different from our own.

Our immediate priority though is to get our Spring/Summer collection finalised and live. We spend a lot of time thinking before coding to make sure that we get our designs just right for a broad demographic.

And the ultimate goal?

Ruby: 2 million users in 5 years, and to be known as the trusted, high quality 'go to' resource by knitters around the world.

Alice: All of that and I'd also love leading designers to want to work with us to give their ideas the **Made & Worn** treatment.

madeandworn.co.uk

What's going on down the corridor?

Bringing together some of the latest news from Southampton Science Park's community of game changers.

CRITICAL Software tests attitudes to testing

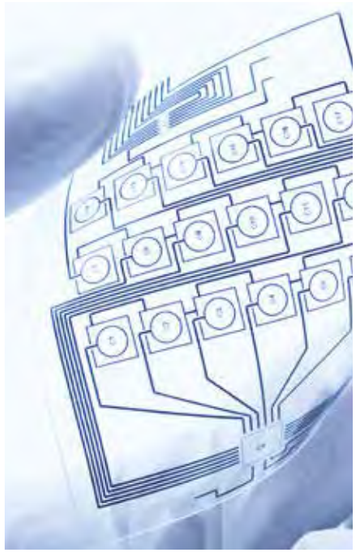
Proven technologies have the edge over new technology in the eyes of the consumer, according to research conducted by CRITICAL Software.

The OnePoll survey of 2,000 people found that individuals prefer to use tested technology that is proven to work over technologies that are completely new. 52% of respondents commented that using the latest and newest forms of technology is important to them, whereas 95% of people said that technology that's proven to work is important. In fact, expert testing ranked higher than brand reputation (73%), point of purchase (70%) or country of origin (61%). The study also found that, despite 98% of people stating that the reliability of the tech they use is important, only half believe it to be properly tested before being sold. Nearly one in two people said technology fails them once a week or more. Safety, security and ease of use are perhaps unsurprisingly the key attributes that consumers regard as critical considerations in their purchase decisions.

Nuno Silva, the company's Chief Test Engineer, said: "For all the awe-inspiring developments, people still seem to have concerns about the reliability of the technology we use in our lives. The pressure to release new technologies can sometimes come at a cost to reliability. The problem with this is that more and more technologies are becoming critical to our day-to-day lives, impacting things like safety and security, and the consequences of getting these things wrong can be catastrophic."

> "The pressure to release new technologies can sometimes come at a cost to reliability"

CRITICAL Software is raising awareness of the importance of expert product testing via a new website:
info.criticalsoftware.com/testyourtech



Ilika Boosts Ultra-Thin Semiconductor Research

Innovate UK has awarded Ilika, in partnership with PragmatIC and Arm Holdings, funding of £0.6m for a project to develop ultra-thin and flexible semiconductor technology for mass market applications.

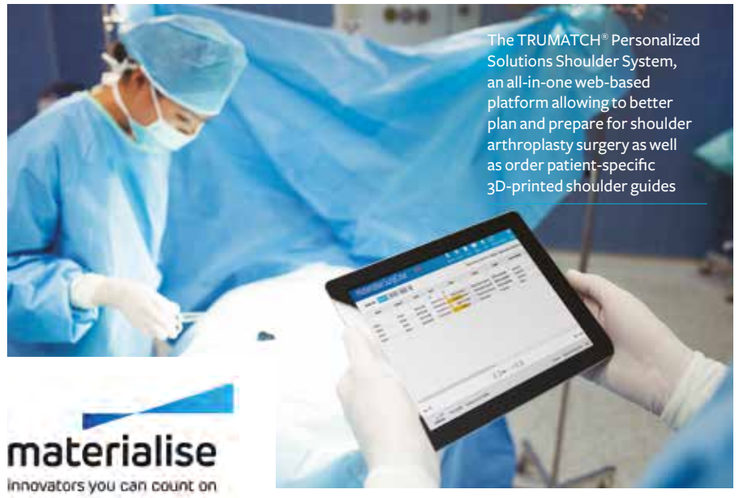
The project aims to deliver novel P-type metal-oxide semiconductor ('PMOS') circuit technology that can significantly enhance the characteristics of PragmatIC's CMOS designs. The initial phase will demonstrate the innovative thin film transistor performance, followed by scale-up and transfer of the material to deposition processes in a production environment.

Ultra-low power, ultra-low cost flexible electronics can add functionality to many items and extend proven applications such as RFID and NFC into mass-market uses which have been previously cost prohibitive.

Commenting on the collaboration, Ilika's CEO, Graeme Purdy, said: "This collaboration is a strong fit with our technology capability in rapidly developing novel thin-film materials and devices. A successful outcome would enable the collaboration partners to address large global markets in this disruptive sector. This programme is expected to yield a complementary IoT-focused technology alongside our solid-state batteries."
ilika.com

Materialise assists shoulder surgeons

Orthopaedic surgeons around the world will benefit from an all-in-one, web-based platform which will allow them to better prepare for shoulder operations, following the launch of TRUMATCH® Personalized Solutions Shoulder System by Materialise.



The TRUMATCH® Personalized Solutions Shoulder System, an all-in-one web-based platform allowing to better plan and prepare for shoulder arthroplasty surgery as well as order patient-specific 3D-printed shoulder guides

The measurement, viewing and implant positioning features of the TRUMATCH® Personalized Solutions Shoulder System helps surgeons make better informed, clinical decisions before, rather than during, surgery. It also enables them to order patient-specific 3D-printed surgical guides. This increased pre-operative preparedness gives the surgeon's team greater confidence and control during surgery, and a better outcome for patients.

"3D planning is gaining popularity with orthopaedic surgeons performing shoulder operations," said Wilfried Vancraen, the company's Founder and CEO. "Together with our strategic partners like DePuy Synthes, we are continually working to improve surgical planning processes for a range of operations. We are proud that this expanded collaboration will empower even more orthopaedic surgeons to discover the benefits of online planning and 3D-printed, patient-specific surgical guides."

Materialise provides open, flexible platforms which enable players across healthcare, automotive, aerospace, art and design and consumer goods sectors to build innovative 3D printing applications that make the world a better and healthier place. It is the first company to receive FDA clearance for its modelling software to be used in US hospitals.
materialise.com/en

WSV partner, SHUMAS Cameroon, using BluPoint to advertise WSV's solar lamp enterprise Right Light

BluPoint & WSV equip African entrepreneurs

Remote communities across Africa are set to benefit from a partnership between two previous Catalyst companies, BluPoint and Wessex Social Ventures (WSV).

WSV is a social enterprise that helps NGOs and businesses to build sustainable communities through the development of micro-enterprises. Its portfolio addresses 12 of the United Nations Sustainable Development Goals by tackling issues of menstruation, sanitation, fertiliser access and solar energy access. However, maintaining a connection with the communities it serves is a challenge.

Partnering with BluPoint will allow WSV to transform its market research, training, monitoring and impact evaluations by enabling direct contact with communities, who use only basic feature phones and cannot access local internet facilities. Whilst coaching entrepreneurs, WSV can provide them with training materials directly to their phone, including videos converted by BluPoint's technology. Once the entrepreneurs have completed initial training, they can keep up-to-date with new content via the BluPoint Hub.

The BluPoint Hub provides a robust and resilient offline internet solution to companies, governments and NGO's. It delivers offline internet access without the need for electricity, smartphones or devices and high data costs. Powered by solar panels, it can broadcast video and digital content to the 77% of mobile users in Sub-Saharan Africa who don't have smartphones.
blupoint.org
wsv.global

Senseye views the future

A leader in predictive maintenance software, Senseye is growing at pace. Having doubled in size and upgraded its UK headquarters at USSP and opened an office in Germany, the company has also recently raised £3.5m at the close of a Series A funding round led by MMC Ventures.

Senseye's cloud-based solution helps manufacturers reduce maintenance costs by automatically identifying machine failure through machine learning algorithms fed with data from the Industrial IoT. Users can benefit from up to a 40% reduction in maintenance costs, as well as lowering unplanned downtime by up to 50%. The product requires no additional hardware or customisation, which means it can be installed quickly, realising the benefits almost immediately.

Already trusted by a growing number of Fortune 500 industrial and manufacturing companies, including leading global automotive and automation brands, the funding will enable Senseye to meet the diverse needs of existing and new customers by expanding the company's research and development teams. This will ensure the product remains at the forefront of predictive maintenance technology globally.

Senseye CEO, Dr Simon Kampa, who co-founded the company in 2014 said: "We're confidently on the way to making unplanned machine downtime a thing of the past and leading an emerging $5bn market."

Simon Menashy, Partner at MMC Ventures, said: "We believe that predictive analytics is going to have a transformative impact on industrial companies over the next decade. Over the past year we have met and assessed more than 250 companies applying AI and machine learning technologies across every sector – Senseye's mix of cutting-edge data science and deep understanding of engineering puts them amongst the very best we have seen."

Senseye has published a free white paper which looks at the current condition monitoring landscape, including technology, continuous versus manual monitoring, implementation foundations and timescales, available at: **www.senseye.io**

"We're confidently on the way to making unplanned machine downtime a thing of the past"

TrackBack equips Mazda and Volvo

As customers increasingly research cars online and submit digital enquiries, both Mazda UK and Volvo Car UK have selected TrackBack to ensure their online customer enquiries receive prompt, professional responses.

Fully integrated with the car manufacturers' lead management systems, TrackBack speeds up the time it takes to respond to customer enquiries, placing greater focus on the quality of responses by the dealer network. It also provides accurate and objective reporting to manage lead generation and conversion activity, giving management teams an opportunity to coach their teams based on insights from real-time data collection and feedback. Shirley Aston-Tang, CRM Manager at Mazda UK said: "Striving for the best customer experience is absolutely vital to the success of Mazda UK and its dealer network. The insight and reporting provided by TrackBack will help focus our efforts to deliver best-in-class performance, by consistently responding to every single lead with a high-quality and timely communication."

Chris Francis, Volvo Car UK's National Sales Process Development Manager, added: "Connectivity is key in the industry now and it is no longer a case of consumers telephoning us or coming in to speak face to face with our retailers. More customers are choosing to configure the car they want digitally, via our website. When they are ready to take a test drive, an increasing number complete an online request. TrackBack ensures retailers can respond immediately to those online requests to ensure sales opportunities aren't missed."

"Connectivity is key in the industry now"

Gareth Thomas, TrackBack's Managing Director, commented: "We are delighted to be working with Mazda and Volvo at exciting times for both franchises. Our experience with leading brands in the UK, Europe and Asia means that we are confident that TrackBack will deliver a better all-round customer experience, and increased sales opportunities for the dealers."
trackback.net

Southampton flies high

Southampton has been chosen to take part in the Flying High Challenge, a project that aims to design how drone technology could operate in complex city environments to address local needs. The announcement follows an open call by global innovation foundation Nesta in partnership with Innovate UK. It is one of five cities selected for the programme.

From using drones to support public services to the commercial opportunities that might exist, the project will explore the public attitudes, environmental impact, logistics and safety of drones operating in complex urban environments.

Southampton City Council has a vision to accelerate the safe delivery of public services and commercial activity using remotely piloted and autonomous drone systems, notably around port safety, blue light services and offshore logistics. The council is working in collaboration with the University of Southampton, which has very strong drone and autonomous systems expertise as the leader of a large consortium project, CASCADE, looking at implementation of drones in civil airspace. Southampton City Council also participates in the EPSRC Future Cities project from a drone perspective; and the Airstart project with the Royal National Lifeboat Institute (RNLI) investigating safe routine operation of small UAS' Beyond Visual Line of Sight (BVLOS).
flyinghighchallenge.org

USSP companies awarded quality marks

Several Science Park businesses have recently achieved ISO certification.

Smart water network solutions company i2O has achieved ISO 27001, the internationally recognised mark of best practice in information security and managing critical data. The accreditation applies across i2O's business, technology estate and client systems and provides independent, expert verification of the company's information security practices and confirms that its data is managed to the highest standards. More than 100 utilities in over 30 countries benefit from i2O's smart water network solutions.

Joel Hagan, i2O's Chief Executive, commented: "i2O's clients are responsible for critical national infrastructure and place a high level of importance on all information security matters. ISO 27001 is the gold standard when it comes to information security and data management. It gives clients confidence that we look after their data to strict internationally recognised standards."

Meanwhile, accelerated materials innovator Ilika and HiLight Semiconductor, which designs and supplies integrated circuits for fibre optic applications, have both been awarded ISO 9001: 2015 Certification for their Quality Management Systems. This certification promotes the development of continual improvement, customer satisfaction, traceability and international best practices.

Graeme Purdy, Ilika's CEO, said: "This certification is an enabler for closer cooperation with both our suppliers and our customers, who are increasingly adopting this standard for their own processes. As Ilika moves closer to the transfer of its technology to manufacturing partners, ISO 9001 is proving to be a useful tool for communication of process detail on a common quality platform."
en.i2owater.com
ilika.com
hilight-semi.com

A VIEW FROM WESTMINSTER

Rt Hon Caroline Nokes MP, Minister of State for Immigration,
Member of Parliament for Romsey and Southampton North

Some of my constituents regard Southampton University Science Park as something of a hidden gem, however I always do my best to highlight it. From being mentioned in my Maiden Speech, to being my go to example of the success of incubators, innovation and enterprise, I never shy away from describing it as one of the biggest drivers of the wider Solent economy.

Opening of a new laboratory for Science Park resident Merck. **merck.co.uk**

But it is inevitable that I always emphasise the success the Park has in keeping traffic flowing and maintaining a green and rural appearance. It is possible to have global companies and innovative science in a rural location, without causing visual or environmental intrusion. Of course I might be expected to say that, having cut my political teeth on the planning committee of Test Valley Borough Council, and I remember fondly the role the Science Park had in that apprenticeship.

The challenges of industry have become all too clear in recent years, with businesses being obliged to rise to the challenge of the digital economy, and often having to restructure to meet the needs of a modern, global economy. However, what I continually hear from businesses on the Science Park is how companies headquartered around the world are keen to keep a base of operations in Southampton. This is hugely encouraging for me and something of a badge of honour for the local economy.

In my constituency there is a real mix of enterprise, from the rural industries and agriculture, through to Merck and Fibercore. The local Borough Council has a good and proactive Economic Development Unit, which works hard to assist finding support for businesses from a range of sources. SMEs make up the bulk of businesses in Romsey and Southampton North, with a substantial number involved in innovating and manufacturing. So it is important we recognise the need to make sure there are clear routes to Government support (both local and national).

The single most frequent concern raised with me by local businesses is access to good broadband. The effect poor internet connections have on business can be quite dramatic, with too many business owners having to send emails from home, or visit a coffee shop during their lunch break. It does, I appreciate, sound rather far-fetched to discuss a lack of modern connectivity in an article about the strengths of the science and innovation sector in my constituency, however for many this is a real challenge.

LOOK SOUTH

"I look forward to continuing to see a flourishing partnership between industry and education in Southampton and for that partnership to be mirrored around the South of England in the future"

In some areas businesses and residential customers have formed groups to successfully roll out projects bringing ultra-fast broadband to their doorsteps and for many businesses in rural parts of my constituency who have struggled, this is an enormous step forward into the 21st century which can only serve to further boost the economy and send productivity skyrocketing. For those reading this who might be experiencing similar issues, my advice would be to investigate the willingness of telecoms companies to install new infrastructure to support your business needs.

The UK Government published its industrial strategy in November and focuses around five foundations which align with the vision for a transformed economy; Ideas, People, Infrastructure, Business Environment and Places. Each of these foundations can almost certainly be met by one or more businesses on the Science Park, but how can we meet these more widely in the South of England?

I would challenge businesses to look at the hugely successful partnership in Southampton and invest more in specialist locations dedicated entirely to science and innovation. The strong relationship with Southampton University is always lauded by those I visit as a wonderful way of encouraging students to stay local and builds an educated, loyal and modern workforce in the STEM sector which is so crucial to the future of our economy.

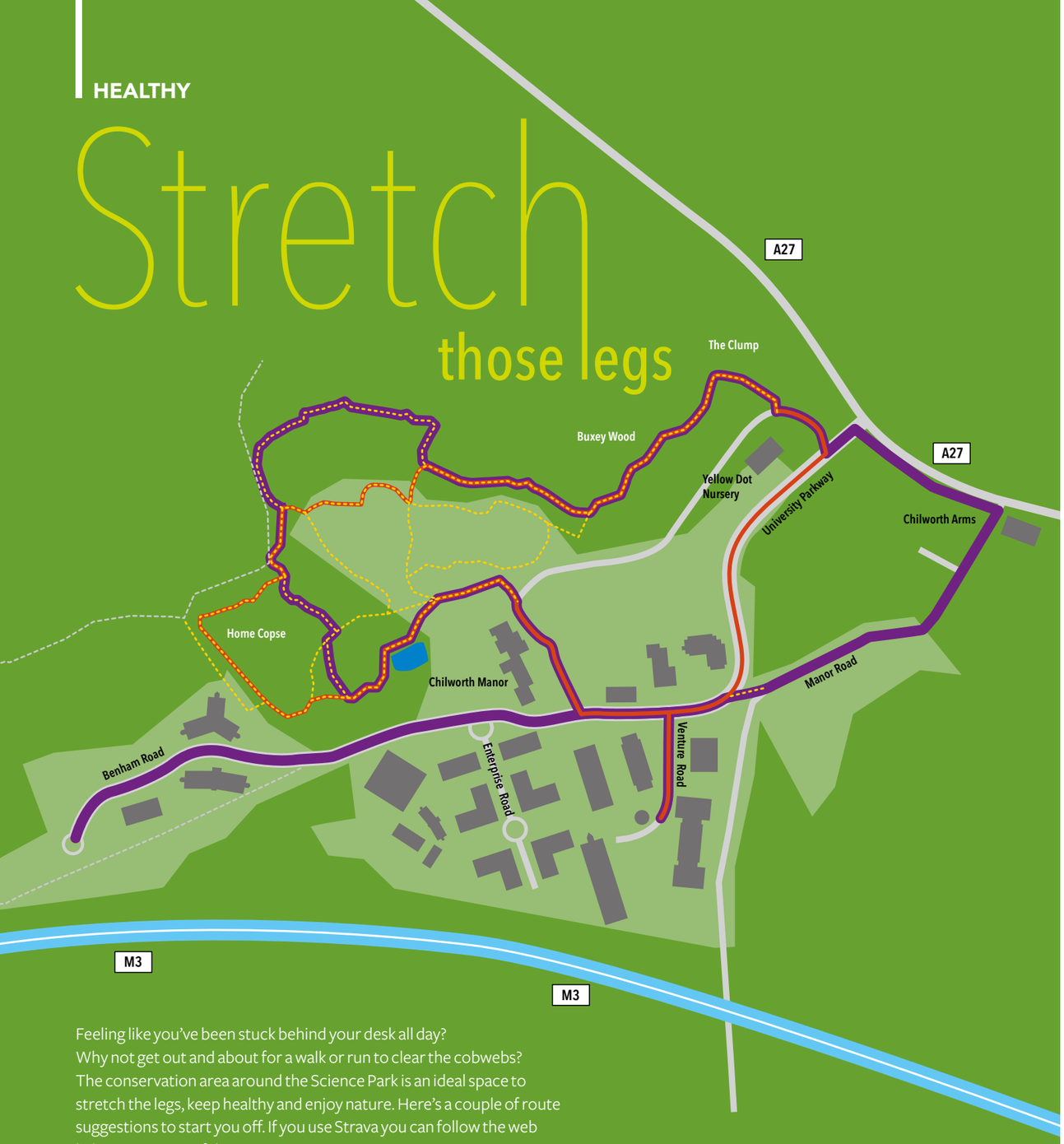
I am always thrilled to be introduced to people who were once students at Southampton University and have been working for the same company for a decade or more, as well as those who are on assignment from their degree, getting much-needed experience in the workplace. This isn't something I see occasionally, it happens every time I visit any business on the Science Park and is, I feel, the key to the success of the partnership.

For a successful future for the entire region, businesses, universities, investors and property owners need to think outside the box to deliver working partnerships based on the model in Southampton. I image few would have thought, when the Science Park company was originally formed in 1983, it would have become a centre for innovation acknowledged worldwide as a best practice example.

I know such campuses are highly sought after throughout the region and very much hope to see more opening in the course of the next decade. The UK industrial strategy is firmly behind companies specialising in STEM subjects and with more young people – particularly young women – being encouraged to take a step into the world of science and innovation, we need to continue to grow businesses for their futures.

I look forward to continuing to see a flourishing partnership between industry and education in Southampton and for that partnership to be mirrored around the South of England in the future.

Stretch those legs



Feeling like you've been stuck behind your desk all day? Why not get out and about for a walk or run to clear the cobwebs? The conservation area around the Science Park is an ideal space to stretch the legs, keep healthy and enjoy nature. Here's a couple of route suggestions to start you off. If you use Strava you can follow the web links to get maps of the routes.

Route 1

Approx 2.5K Walk (Road and Trail route): **strava.com/routes/12892470**
Starting from 2 Venture Road, walk up to the hotel driveway, and take the trail down past the lake. Follow the path through Home Copse, out into the meadow and across into Buxey Wood. The trail will take you through the woods and past Yellow Dot Nursery. Join University Parkway and walk back down to 2 Venture Road and pop into Lattes for a cup of tea and a piece of cake!

Route 2

Approx 4K Run (Road and Trail route): **strava.com/routes/12892645**
Start at 2VR, run down to the roundabout at the bottom of Benham Campus and back up and round past the front of the hotel. Take the trail down past the lake and then up through the centre of Home Copse. Continue up into Buxey Wood and follow the trail north and then right through the trees to Yellow Dot Nursery. Join University Parkway and run back to Lattes for some well earned refreshment.

Get the balance right

Fun, films and fitness: there's a wide variety of social activities taking place over the summer to keep your work-life balance just right.

Social Club

USSP Social Club helps to enhance social interaction across its community of companies through an annual programme of events. This summer, it has a menu of events designed to flex your muscles, your jaws and your brain cells! All are open to any employee of any company based at Southampton Science Park. So, get involved and meet some new people!

The annual Science Park BBQ takes place on Thursday 12th July in the sunken gardens from 12noon. Tickets are available from the Science Park office. And for those less physically inclined, how about joining one of the Park's quiz teams? Hosted by Wessex Academic Health Science Network, the next Science Park Quiz will take place on Thursday 13th September. There's a shiny new trophy shield at stake! An Eventbrite site will be set up to register your team closer to the time of the event.

The Social Club is run by a committee of staff drawn from resident companies and is always happy to welcome new faces.
If you'd like to get involved please contact Committee Chair Nadia Kuftinoff.
nadia.kuftinoff@wessexahsn.net

Chilworth Manor

After a successful launch in 2017, Movie at the Manor is back. This year, Chilworth Manor will proudly present the legendary Top Gun on Friday 31st August for its pop-up cinema event. Doors open from 6pm with the movie starting at 8.30pm.

Code-named "Maverick", Pete Mitchell (Tom Cruise) is an impetuous daredevil Navy-pilot ace, accepted into the elite Fighter School, also known as Top Gun, to compete with the best of the best. Haunted by his father's mysterious death, will Maverick be able to suppress his wild nature to win the prestigious Top Gun Trophy and get the girl?

Enjoy drinks on the terrace before finding your spot on the lawns. Bring your own blankets and picnic chairs, or hire a luxury beanbag, and settle down for an evening of great classic movie entertainment. Accommodation offers are available by contacting the hotel directly if you wish to make a night of it.

Food options include pre-cinema dinner in the Manor Restaurant, pre-booked picnic boxes for collection on arrival or a BBQ on the night. **For tickets and options see: seetickets.com/event/movie-at-the-manor-top-gun-12-/chilworth-manor/1213569/**

The Club

Did you know that Corporate Membership of The Club is available for companies based at the Science Park? Facilities include a heated ozone-cleansed pool, hydrotherapy spa pool, sauna and steam room and a poolside relaxation area; 29 station gym, studio and pool classes, personal training, spa treatments and physiotherapy. Find out more at **theclub-southampton.co.uk**

OPEN FOR BUSINESS

Southampton Science Park is committed to promoting open innovation and collaborative working and offers this page as an additional way to reach out to fellow people and organisations around the Park.

Are you fulfilling your potential?

CATALYST

Do you have – or do you know someone with – a great idea that you think has the potential to make a difference to society – but don't know how to turn this into a flourishing business? Well the good news is that you don't have to beat a path to Silicon Valley to do so. Try Chilworth.

USSP's highly respected and successful Catalyst business incubator programme is a unique opportunity for entrepreneurial spirits with scientific or technology-led business ideas. For those accepted onto the programme Catalyst provides six months of free business coaching, peer group workshops, residency at the Science Park with access to its prestigious entrepreneurial network, and a £1,000 cash injection with links to further funding opportunities.

The programme is proven to fast-track exciting new businesses in the South. Since its inception in 2012, participating start-ups have secured £8m in seed funding, been featured in The Times Start-up List, and some have signed significant global partnerships. All have left with much more than they went with.

Find out more and apply at **catalyst-centre.co.uk**

Do you know someone who likes to knit?

Made & Worn enables anyone to design and knit unique creations whilst taking away all the common frustrations that knitters experience with ill-fitting garments and difficult to understand patterns. Its real-time guided patterns for hats, cowls and mittens, priced from just £3, are being downloaded all over the world.

Named Catalyst Business of the Year 2017, the creative team behind Made & Worn want to encourage as many people as possible to take up this stress-busting and creative hobby, and is offering readers of SO **25% off any pattern until 1st November 2018. Simply visit www.madeandworn.co.uk and enter code SPN25 at checkout.**

Do you want a new career in finance?

Having recently moved to larger offices at the Science Park to accommodate expansion, Avonglen is currently recruiting for a Finance Manager and a Business Development Executive.

The company specialises in providing Finance Director level support to businesses on a permanent but part-time basis, as well as undertaking outsourced finance functions.

Find out more and apply at **avonglen.com**

Do you need help with something?

If your company is:

- looking for any specialist skills or input to move a project forward;
- recruiting;
- interested in hearing about research undertaken on a particular topic;
- needing support for a challenge or a sustainability or charitable initiative;
- interested in an open innovation exploration;
- running an event, or anything else that you want people to know about, email **enquiries@science-park.co.uk** with details and we will endeavour to raise awareness of this in our Autumn/ Winter edition.

IN FOCUS

Hampshire

Hurst Spit jetty and lighthouse

1.7m people

60,000 businesses

£35bn economic output per annum

20% of total South East economy

GAME

32 national teams. 12 stadiums. 64 matches. 1.7 million tickets sold to date. It can only mean one thing: the world's biggest sporting event has kicked-off. But have you considered the behind-the-scenes technologies that are driving the FIFA World Cup 2018? Do you know your VAR from your EPTS?

5G

Chinese telecommunications giant Huawei and Russian mobile carrier Megafon are collaborating to debut the world's first 5G mobile network in June, two years before widespread industry estimates. The primary technologies include millimetre wave bands offering performance as high as 20 gigabits per second and massive Multiple Input Multiple Output up to ten times more powerful than current 4G networks. This will be welcome news for the 75% global TV viewers expected to be on social media while watching the game, with Facebook being the medium of choice and smart phones being the preferred device.

NFC ON THE BALL

The Adidas Telstar 18 World Cup Glider ball to be precise. With an embedded near-field communication (NFC) chip – the same technology that powers contactless payments – it can connect to a smart phone to access content and information that is unique to that ball.

SUPERFAST GLT

Goal Line Technology (GLT) isn't new but accuracy and speed has been taken to a whole new level as ball position will now be tracked and information relayed in one second. Official timekeeper Hublot, has developed its first smart watch for the event, the Big Bang Referee 2018 FIFA World Cup Russia. A special edition of this watch will be worn by the referees to interface with the goal line technology to notify them when a goal has been recognised by the automatic system.

FAN-FRIENDLY VAR

Amid a great deal of controversy, Video Assistant Referees (VAR) will be used for the first time this year. The aim is to achieve 100% accuracy by avoiding obvious mistakes rather than re-referee the whole match. VAR supports the referee in four game-changing situations: goals and offences leading up to a goal, penalty decisions and offences leading up to a penalty, direct red card incidents and cases of mistaken identity. The ref on the pitch then has the option to accept the information that is relayed to them by audio, or review it on screens before taking action.

It's not just the officials that will get in on the action though. After a decision is made using VAR, replays will be transmitted from the video operations room to broadcasters and to giant stadium screens accompanied by written explanations surrounding the decision so that fans get the same insight.

GAME CHANGING AI

A Chicago-based sports data and technology company, Stats, is bringing artificial intelligence (AI) to both the broadcast booth and sideline. By training computers to review game footage, code it and extract statistics, it's possible to aggregate data sources on a much grander scale than humans can. In this way, AI will provide fun facts for broadcasters to relay to fans, and predictive analytics for coaches and players. It can show, for instance, a play in which the team failed to score and recommend a different run that could result in a goal.

FAN SAFETY FRT

2018 comes face to face with 1984 as facial recognition technology will be deployed in Moscow metro and train stations near stadiums hosting matches. Capable of identifying 20 faces per second with a 90% accuracy rate, the $500,000 cameras are part of the Moscow's 'Safe City' surveillance system of 160,000 cameras.

REAL TIME EPTS

The use of camera based and wearable Electronic Performance and Tracking Systems (EPTS) is likely to be in use by all teams at this year's competition, enabling match analysts and coaching teams to interact with what's happening on the pitch in real-time. Monitoring ball position and individual player key performance indicators – players' heart rate and temperature, distance and speed, for example – could make a serious difference to individual performance and team tactics.

ON

GOLD STANDARDS

Beryl Barrow of Braishfield Pantry, Lisa Armstrong of Active Staff, Penny Billingham of Test Valley Borough Council, Jim Beacher of CoolLED, Val Kempster of Rosebourne, and Victoria Thorp of Queen Charlotte Inn

Peter Birkett, CEO of Southampton Science Park, comments on why he believes that local awards shouldn't be overlooked by technology companies.

"Our region is a hotbed of talent, innovation and entrepreneurship: I witness this here at the Science Park daily across all areas of commerce and industry. I see it transforming traditional sectors like healthcare and forging new paths in up and coming ones like machine learning. The diversity of expertise here never ceases to inspire.

> Our region is a hotbed of talent, innovation and entrepreneurship: I witness this here at the Science Park daily across all areas of commerce and industry.

And it's not just the corporates either: we mustn't underestimate the power of SMEs. Often it is the smaller companies that have the drive, adaptability and imagination to succeed and compete effectively when large corporates do not.

For some years now the Science Park has been a gold sponsor at the Test Valley Business Awards, helping to showcase the Innovation & Technology Award category. This annual awards scheme is well established as the platform for businesses in the area to gain the recognition they need to grow while celebrating their achievements to date. The 2017 awards attracted nearly 200 entries from businesses across the region and this year's awards are expected to be equally hotly contested. I, for one, can't wait to see who will enter because evidence suggests that being recognised in this way is a springboard to further success.

In 2009, winner Photonstar LED went on to become a leading designer and manufacturer of intelligent lighting and building solutions. A former USSP tenant, the company is floated on the Alternative Investment Market at the London Stock Exchange.

Symetrica, another former USSP tenant supported by the SETsquared business incubation programme, has gone from strength to strength and now turns over £18m. A trailblazer in radiation detection and identification, its range of detectors, from handheld devices to mobile solutions and portal monitors, serve customs and border protection, law enforcement and military, emergency services and first responders across the world.

1st Touch won the award in 2014. A start-up company when it arrived on the Science Park, 1st Touch scaled and was recently acquired by Aareon Group, moving into our new Benham 5 building. The company provides enterprise mobile workforce solutions delivering world class mobile applications dedicated to social housing.

Fresh Relevance's technology caught the judges' eyes in 2016, blending marketing creativity with smart technology to maximise revenue and elevate the customer experience for many household name clients. The company has experienced spectacular growth since arriving at the Science Park as a start-up, recently announcing substantial incoming investment.

And let's not forget the 2017 winner, CoolLED. The manufacturer of LED illumination and fluorescence microscopy systems for laboratories has witnessed high growth since developing its product in a Knowledge Transfer Partnership with the University of Southampton.

> These examples of business success are extremely compelling and demonstrate that credible, independently-assessed awards are incredibly important in championing regionally-based businesses.

These examples of business success are extremely compelling and demonstrate that credible, independently-assessed awards are incredibly important in championing regionally-based businesses. Win an accolade like this and the world could really start to sit up and take notice!"

Ross McNally of Hampshire Chamber of Commerce, Hendry Taylor of Taylored IT, Peter Birkett of the University of Southampton Science Park, The 2017/18 Mayor of Test Valley, Cllr Carl Borg Neal, Richard Gillies of Simplyheath, Lucy Dixon (and guest) of Wilkins Kennedy, and David Drew of Test Valley Borough Council

licensing as opposed to purchasing model, there is complete accountability and protection for the asset owner (the opportunity to stamp out piracy in the entertainment industry, for example).

In the public sector, there is huge scope for increasing efficiencies and reducing bureaucracy with secure platforms for data sharing underpinning the welfare system, public housing and healthcare provision. Blockchain could even transform democracy through transparent voter registration, identity verification and accurate counting processes.

Charities too, could embrace the technology to track donations to ensure they end up where intended: faster and with less risk of corruption and middlemen reducing value along the way.

As public, investor and regulatory pressures around data security, corruption and corporate trust continue to rise, does society already have the answers in

BLOCKCHAIN?

What is it?
A blockchain is a fast, efficient and secure way to exchange units of value across a network of computers using encryption technology. A peer-to-peer decentralised ledger which cuts out middlemen, it's effectively powered by self-interest. Transparency is a given, because no single entry can be altered without the alteration of all subsequent blocks and the knowledge and consent of the entire network.

Conceived by Satoshi Nakamoto in 2008 for use in the cryptocurrency bitcoin, blockchain is fast becoming not just a disruptive force, but a foundation technology, across the globe and across the economic spectrum.

Why is it important?
Blockchain solves the long-standing problem of double-spending because each unit of value can only be transferred once. This enables participants in the network to speed up transactions, to verify and audit transactions inexpensively, to create efficient, transparent and robust workflows and ultimately to have complete confidence in the process. Without reliance on traditional intermediaries in value exchange (like banking systems) opportunities for human error or fraudulent behaviour are virtually eradicated, as are system failures due to its decentralised nature.

Fuelling innovation, blockchain crowd funding platforms have already raised $millions for growing companies, enabling them to accelerate time-to-market, create supply chain accountability and smart contracts, and to build a sound online reputation.

How can it be applied?
It's easy to see blockchain in use across conventional banking, insurance and housing sectors by being able to improve identity verification, abolish paper based records and speed up transactions. It could even open up opportunities for those in the developing world who may not have access to traditional banks to participate in the global economy.

However, any organisation could use blockchain to manage significant or complex supply chains with the utmost transparency to improve planning, monitor resource use, track costs, organise labour, cut waste, and enhance globalised forecasting, research and analysis. And, for those adopting a

From retailing which connects buyers and sellers without intermediaries mark-ups and fees, to enabling peer-to-peer energy purchase doing away with the traditional wholesaler/retailer landscape, blockchain has the power to disrupt all aspects of daily life.

10%

of global GDP will be stored on blockchain technology by 2025

(World Economic Forum: Deep Shift: Technology Tipping Points and Societal Impacts, 2015)

Where will it go from here?
Everywhere. Any application where there are a large number of participants who have similar authorisation levels, and trust is at stake, could benefit from blockchain.

If you're not already embracing the potential, think again. The globe is rapidly moving toward a new economic norm; a smart global economy which promises to bring significant efficiencies to global supply chains, financial transactions and social networking.

Making the decision to scale-up is one that many entrepreneurs struggle with. We ask William Harris, Director of Avonglen why this is the case.

When to scale

William, you've worked with many companies at all different stages of development. What barriers prevent entrepreneurs from taking the all-important step of scaling their business? Entrepreneurs have already done well if they get to the point of being able to think about scaling up. Statistics show that 20% of businesses fail within their first year, 40% within five years and 70% within ten.

At that stage, they will probably have a well-developed product or service with a market identified and a good core team of people. The skills that we find are most often missing are marketing and financial. Given that the biggest barrier to scaling up is not having sufficient funding, it's important to have financial skills within the management team. Entrepreneurs will already believe that their business is ready to grow but they need to be able to convince investors too.

How should entrepreneurs plan for effective growth? Lots of research and robust business planning, using assumptions that have been thoroughly sense-checked and tested using real data from existing businesses.

Entrepreneurs must first accurately assess whether their product or service is scalable and whether the market is sufficiently developed to achieve that scale-up. Quite often with innovation there is no pre-existing market – nobody knows that they want or need your product or service. Creating a new market from scratch takes time and many innovative businesses have run out of money before they develop a market sufficiently. Many people think that if there isn't a direct competitor the business is bound to be successful. Counter-intuitively, if there are existing competitors providing a similar service or product to yours, it is easier to demonstrate the size of the market opportunity and this may give would-be investors confidence.

During the planning process it's important to have effective challenge. Having the founders all believing that the business is going to do really well is great, but having a knowledgeable external mentor or advisor to challenge all of the assumptions that are being made will improve a plan out of all recognition and will help answer many of the questions that will come later.

What specifically do investors look for? Every investor will have its own set of investment criteria. Some investors only invest in specific sectors or in companies of a particular size, but the factor I hear mentioned most often is 'people'. Yes, of course, a well-prepared business plan, containing honest projections that demonstrate the scalability of the product or service is important, but investors need to believe in the management team and their ability to deliver the plan.

What are the pre-requisites for scale-up success? The ability to cope with change is a key competency, especially when it comes to people planning.

You may have the idea, concept, product and ambition to go with it but you need the right team around you. You can't do it on your own and the team will almost certainly need change as you go through the scale-up process. In my experience people tend to be most comfortable in a small company or a large company environment and consequently it's important to recognise that there will be relatively few people who will feel comfortable over the whole of the company's life. The people you need through the development process may be significantly different from the scale-up phase and if you get to the stage of turning over £100m.

If you have got a business that is trying to achieve significant growth, the pressures on the team as you go through that growth phase can be quite incredible and you have got to make sure that the 'people plan' copes with that. Preparing staff for the inevitable change in roles and responsibilities when they first come on board will help prevent resistance further down the line.

Which is more important: what you know or who you know? They are both important: the knowledge and expertise to build a robust business and the network of partners who can help you achieve them.

Is timing everything? And if so, when, typically, is the right time? Timing is important because if you have a new product in a new market you want to be there first. But, if the market is under-developed it's possible to go too early. Conversely, getting to market second could make it seem like you're behind the curve. Both could lead to failure so the best time is to 'ride the wave' and aim to be the market leader. This goes back to the "who you know" question earlier. When cash is limited, entrepreneurs might consider trying to partner with an established business and use their existing reputation and network.

What other key factors should business owners consider? Three things spring to mind. Firstly, rewards: is everyone properly incentivised? In a start-up or scale-up, the management team may not be paid very high salaries so it's important that everyone is properly incentivised with equity or options. Second, cashflow management: never underestimate the need for headroom, as things never quite go according to plan. Above everything, make sure you don't run out of cash. So if your plan identifies two points that will require raising money, make sure you are ready for that. Finally, exit: investors will want to know there is an opportunity to exit and what the exit plan looks like.

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Avonglen worked with OrthoView, an ambitious and innovative medical technology business based on the Science Park, seeing it through the entire cycle of forecasting, funding, growth and successful sale.

Avonglen started working with OrthoView a year or two into its journey. The company had raised Venture Capital funding, but it needed a sound business plan. Avonglen devised robust financial reporting systems and created a financial forecasting model to aid cash management. As the company grew Avonglen provided the Chairman and Finance Director roles and operated the whole of the finance function on an outsourced basis. It also provided guidance in setting up a US operation and ensuring compliance with local tax and employee legislation.

The company expanded rapidly and broadened its geographical reach to Latin America and the Far East before successfully selling to Materialise NV for £8.47 million.

On the successful sale, OrthoView Co-Founder (and CEO until the sale), John Chambers said: "The advice and guidance we received from the Avonglen team during the sale of OrthoView was of the highest order, as were all aspects of the accounts function they provided us with. William Harris's and Tim Hilton's experience and support were invaluable in driving the process and we worked as a close-knit team throughout."

James Livingston, director of lead investor Foresight Group added: "I am delighted with the outcome. The Avonglen team carefully steered the negotiations and provided robust financial support to streamline the exit process for the benefit of all the shareholders."

Fibercore

Optical fibres are manufactured by creating a large piece of glass called a preform which is a short but wide identical copy of the final optical fibre. By heating the preform in a furnace at a few thousand degrees centigrade, the preform can be stretched or drawn to approximately 40,000 times or more the original preform length. This results in turning a 1m long piece of highly engineered glass rod into 40km of specialty optical fiber for diverse uses ranging from biomedical 3D shape sensors through to fiber optic gyroscopes for aircraft stabilisation.

IN FOCUS

Technology

NEWS FROM UNIVERSITY OF Southampton

Alan Turing Institute

The University of Southampton is set to join the Alan Turing Institute (ATI), the UK's prestigious national institute for data science, named in honour of the man whose pioneering work in theoretical and applied mathematics, engineering and computing were key in the emerging field of data science.

Southampton is home to some of the UK's most prestigious research groups in the School of Electronics and Computer Science which has around 250 academic and research staff, more than 630 postgraduate students, and over 1,200 undergraduate students.

Neanderthal Art

A new study led by the University and the Max Planck Institute for Evolutionary Anthropology has found evidence that Neanderthals made cave paintings. Paintings in three caves in Spain were created more than 64,000 years ago – 20,000 years before modern humans arrived in Europe. This means that the Palaeolithic (Ice Age) cave art – including pictures of animals, dots and geometric signs – must have been made by Neanderthals, a 'sister' species to Homo sapiens, and Europe's sole human inhabitants at the time. It also indicates that they may have had a similar artistic sense, in terms of thinking symbolically, to modern humans.

Until now, cave art has been attributed entirely to modern humans, as claims to a possible Neanderthal origin have been hampered by imprecise dating techniques. However, uranium-thorium dating provides much more reliable results than other methods. It involves dating tiny carbonate deposits that have built up on top of the cave paintings. These contain traces of the radioactive elements uranium and thorium, which indicate when the deposits formed – and therefore give a minimum age for whatever lies beneath.

Queens Prize

The Queen's Anniversary Prize for Higher and Further Education has been presented to Professor Sir David Payne and Professor Nikolai Zheludev from the University's world-renowned Optoelectronics Research Centre in a ceremony at Buckingham Palace. The Prizes are the UK's most prestigious form of recognition for a UK academic or vocational institution, with approval directly from The Queen and Parliament.

Professor Sir David Payne, Director of the Optoelectronics Research Centre, said: "Being honoured with this prestigious award is recognition of just how important photonics is to the UK and the extensive role the University of Southampton has played in leading photonics research since the 1960s."

Also representing the University at the Palace were Research Fellow, Dr Katrina Morgan, PhD researchers Andrea Ravagli, Alex Jantzen, Angeles Camacho Rosales and Ausra Cerkauskaite.

Cancer Immunity

Scientists at the University's Antibody and Vaccine Group have shown how stimulating a specific location on the surface of immune cells can be targeted with antibodies to help in their fight against cancer.

The use of the body's own immune system to find and kill cancer cells is rapidly changing the way the disease is managed and treated. Cancer displays unique markers that can be recognised by the immune system but cancer frequently prevents the immune system's attack by putting the immune cells into a state of exhaustion.

The new work concerns a receptor called CD40 found on the surface of certain immune cells which regulates their activity. The CD40 receptors are normally dispersed over the surface of resting immune cells, but must be concentrated and clustered into highly organised complexes to trigger an immune response against cancer. Scientists believe that very precise clustering is required to trigger an activation signal to 'kick-start' the immune cells as they fight diseases.

Population Mapping

Research led by WorldPop at the University, in partnership with non-profit organisation Flowminder Foundation, is helping governments in low-income countries strengthen their capacity to build and use population maps.

Understanding population numbers and distribution at local levels is crucial to national planning, but this information is often lacking in countries where no census has taken place, or census information is fragmented – perhaps due to war, political instability or poverty.

The production of detailed population maps and demographic datasets can aid governments in their efforts to develop fundamental areas such as infrastructure, healthcare and housing, and equip them effectively for disaster relief.

Using this and other approaches, such as analysis of anonymised mobile phone data, it has already been able to help combat the spread of malaria, assist in disaster relief planning following earthquakes in Nepal and Haiti and assess the potential spread of Ebola in West Africa.

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