UNIVERSITY OF BIRMINGHAM

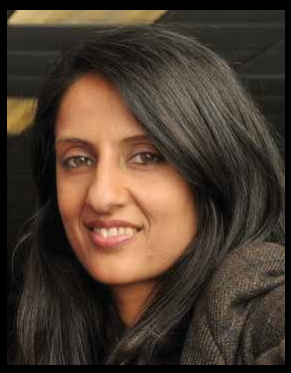
think
Business with Birmingham
issue ten

The University of Birmingham is powering up the Midlands Engine

Birmingham Business School has established City-REDI, a new research institute investigating cities to better understand the needs of local economies. See page 2

Business with Birmingham

Foreword



The University of Birmingham was proud to host a special event to mark the launch of The Midlands Engine Prospectus which represented 11 Local Enterprise Partnerships (LEPs) coming together with a joint plan to, among other things, boost productivity, attract inward investment, and increase connectivity.

Attended by senior politicians and business leaders, it was noted that the success of 'The Midlands Engine' is down to all stakeholders in the community working together. For our part, the University is wholly committed to 'Engagement for impact' as set out in the recent launch of our Strategic Framework 2015–2020. Collaboration is our favoured term in Business Engagement as it is essential that we work with partners like you, whose knowledge and skills complement our own.

As we continue to develop and grow our links with industry, we should also celebrate our successes. In this latest edition of *think* you'll discover examples of how our research is delivering tangible benefits to both SMEs and large corporates. For example the Science City Research Alliance has safeguarded more than 500 jobs in the West Midlands. In addition you'll learn about how the new City-REDI Research Institute aims to influence regional and national economic growth policies.

Whatever the business challenge, we are here to listen and we look forward to some exciting collaborations with you in the coming year.

Gurmit Kler,
Head of Business Engagement

think Birmingham

Birmingham is City-REDI

Following a £4.8m investment by the University, Birmingham Business School has established City-REDI, a new research institute investigating cities to better understand the needs of the local economy and the changing policies impacting on the region.

A key driver for this is devolution, which is driven by the belief that decisions are best made locally. The research institute will be supporting that decision making, providing research, analysis and evidence-based advice to leaders in both the public and private arena.

The work will focus on understanding productivity and growth, and developing a new economic model to explore the whole economic system at a local level. It will be developing new products and services for the public and private sector, exploring: investment; innovation; skills; enterprise and competition; local quality of life; and well-being.

The aim is to engage businesses where possible in the research, helping to shape understanding of the local economy, to develop and improve the model and test the forecasting. City-REDI will also be available to provide research services to help businesses understand the economic environment and support business decision making.

City-REDI

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think start-ups

Smarter connections for smarter businesses

BizzInn tenant Serviceteam IT has been able to grow from one individual to a team of three, with a further three additional staff predicted in the short-term. Turnover for the current financial year is expected to be four times that generated in the year prior to BizzInn support and Sebastian Jesson-Ward, founder of Serviceteam IT, attributes 100% of this rapid growth to the support received through BizzInn.

Serviceteam IT was founded in 2011 when Sebastian saw a gap in the market, helping growing companies that need dependable and secure IT and communications networks without sacrificing the flexibility that keeps them competitive.

Prior to his interaction with BizzInn, Sebastian had not previously worked with a university. Originally in search of office space, Sebastian has now been involved with BizzInn for around two years.

Sebastian cites office space in the BizzInn as being particularly beneficial to Serviceteam IT, but also notes that additional elements such as access to the University of Birmingham specialist business support and academic expertise, were invaluable. Such support has given access to new business networks, fostered links with academics and peer groups, and also enabled access to healthcare and NHS markets. He describes that a wider spectrum of support has been made available, with the BioHub facility acting as a 'fantastic conduit for expertise'.

Through BizzInn, Sebastian was also signposted to various additional sources of support which have proven useful for Serviceteam IT to access. These included the Growth Accelerator Scheme, Aston Innovation Voucher Scheme, and the Santander Business Support Scheme (through which two University of Birmingham interns were taken on and subsequently became permanent staff).

'I can't speak highly enough of the BizzInn team, and Serviceteam IT wouldn't be where it is without their support.'

Sebastian Jesson-Ward,
Founder and Director, Serviceteam IT

BizzInn

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Linear Diagnostics find perfect position

University of Birmingham spinout company, Linear Diagnostics Ltd has recently moved into The BioHub Birmingham®, a fully serviced biomedical research laboratory specifically designed to provide entrepreneurs and innovative start-ups with access to affordable laboratory facilities and equipment.

Linear Diagnostics is a specialist diagnostic company, established by BioScience Ventures Ltd, a joint venture between Abingdon Health and the University of Birmingham, and was spun-out of research at the University to commercialise a rapid diagnostic platform technology. The technology was invented by Professor Tim Dafforn and Dr Matt Hicks from the School of Biosciences and their experience includes research into biophysical spectroscopy, DNA-drug interactions, fibrous protein structure, peptide-lipid interactions and synthetic biology.

As the work became more commercially orientated - leaning towards medical development rather than research - the team needed somewhere with more biological equipment. The BioHub, right on the doorstep of the University, was the perfect choice.

'The shared facilities make access to high-spec, specialist and larger equipment affordable – and with the meeting rooms and office space all under one roof, it's a great set-up. With the University and Queen Elizabeth hospital so close on our door step, we have access to world-class experts, as well as opportunities for ideas sharing and co-development work with PhD secondments.'

Dr Matt Hicks, Linear Diagnostics.

The BioHub Birmingham

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think SMEs

Outcomes of the Science City Research Alliance

Delivering results across the West Midlands

The Science City Research Alliance (SCRA) was established in 2008 with a £57m investment in joint equipment and research infrastructure at the University of Birmingham and the University of Warwick. Funded by Birmingham Science City via Advantage West Midlands, the former regional development agency, and the European Regional Development Fund (ERDF), the principal aims of this Alliance were to pool expertise, and work collaboratively on research in order to engage with business and industry.

This gives business unrivalled access to the latest research and state-of-the-art equipment in the science and technology areas of Advanced Materials, Energy Futures and Translational Medicine. Nearly a decade after its original conception, the Birmingham-Warwick Alliance has delivered real impact to SMEs across the region:

- Over **300** companies involved in new research and development collaborations with the universities
- More than **500** jobs created or safe-guarded in the West Midlands
- **113** graduates in employment in high technology industries
- **1481** individuals developed their skills around key industrial sectors and the use of specialist equipment
- Over **£140m** of new research funding attracted to the region
- **18** new businesses created or attracted to the West Midlands
- More than **50** new patents and licences
- **21** new technology demonstrators

Impact *in brief*

Webster & Horsfall Ltd

- Specialising in manufacture of high value, niche-use wire and strip
- Collaborating with the University of Birmingham across a number of R&D projects
- Now investing 3% of turnover in R&D to improve productivity
- 100 jobs safe-guarded through investment in R&D
- Received funding for a 2½ year KTP

Wired

Webster & Horsfall Ltd is a 300 year old family-owned business with more than 100 employees based in Hay Mills, Birmingham, who are one of the UK's leading manufacturers of wire and strip. Famous for manufacturing the armoured wire for the first Atlantic Telegraph Cable in 1866, the company is now moving into oil and gas applications, utilising the research of the University of Birmingham to specialise in the manufacture of niche, high added value products. Webster & Horsfall were introduced to the University of Birmingham via attendance at a SCRA event in 2010. The company has since gone on to complete a number of collaborative projects with the University, most recently investing £90,000 in a Knowledge Transfer Partnership (KTP) to access the University's materials science expertise.

Collaboration with the University has not only brought about improvements to their technical processes, but by working side by side with the University's researchers, has contributed to a cultural change, raising consciousness amongst shop floor staff about how processes can be analysed using rigorous scientific principles and ultimately improved.

'When the University came in to conduct welding trials, there was good engagement from the shop floor. They wanted to know who made the strongest welds, and are still talking about it now. This "competition" really motivated the staff. We are hoping that the KTP will bring a new level of technical understanding to the shop floor team.

'There are so many assets just down the road that you can get your hands on and that the University want you to exploit. Our collaboration with Birmingham has definitely influenced our strategy in that we have a much more positive attitude to R&D, in which we're now investing 3% of turnover annually. If it wasn't for our investment in R&D, then we would have gone to the wall.'

Jonathan Horsfall,
Director at Webster and Horsfall

SME Engagement Team

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Further Impact *in brief*

Microcab Ltd is a West Midlands automotive start-up, originally focused on light-weighting. In collaboration with the University of Birmingham they have created a hydrogen fuel cell demonstrator and are currently employing a team of nine, to manufacture road-legal hydrogen vehicles. Over the next two years the company will be bidding for £3-5m of venture capitalist investment and is planning to build 500–1,000 hydrogen fuel cell cars.

European Exhausts & Catalysts Ltd is a family run business, manufacturing aftermarket catalytic converters. The company has collaborated with the University of Birmingham across a number of R&D projects. The company is investing substantially in R&D for the first time and working with the University of Birmingham on nano-enabled catalysts. Results are expected to deliver a cost reduction of 20% and profit increase of 100% from this work.

Teer Coatings Ltd, part of the Miba group, is a high technology industrial coatings company in Droitwich. With a strong culture of innovation, they are investing more than 10% of turnover in R&D. Through an introduction via SCRA they are collaborating with University of Birmingham physicists and chemical engineers and investing in Birmingham's cluster beam technology to increase high-value exports. The company is also diversifying into fuel cell technology to be 'hydrogen economy ready'.

think energy

Peak **Performance**

The UK's first dedicated research facility for energy storage using cryogenic liquids was recently opened by The Secretary of State for Business, Sajid Javid MP. The technology could transform future energy systems, reducing the costs of integrating intermittent generation into the electricity system and ensuring power is available when it is most needed.

Cryogenic energy storage systems use renewables and/or off-peak electricity to liquefy air which involves compression and expansion processes. The cryogenic liquid has a temperature below -190°c and is stored in a vessel. It is pumped to a high pressure (150 bar) when electricity is needed. It is then vapourised into a gas, and then superheated using either, or both, heat and waste heat if available, before going through an expansion process in a turbine to generate electricity.

This system generates electricity when it is most needed: taking renewable and off-peak electricity and using it at peak times to solve the 'wrong-time wrong-place' energy generation and supply problem.

The cryogenic energy storage plant is also connected to the University's electrical grid, providing a small amount of power to the campus.

'A Government investment of £5.9m in these cutting-edge facilities at the University of Birmingham will help scientists make their research a commercial success. The project has the potential to transform energy storage by using innovative technology that could create a new industry worth at least £1bn to the UK economy.'

Sajid Javid MP, Secretary of State for Business, Innovation and Skills

Birmingham Centre for Cryogenic Energy Storage

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think biodiversity

Re-wilding captive great apes

Great apes have a key role in maintaining humid-forest biodiversity and forest regeneration processes through seed dispersal and dislodging of dead trees and branches. They are an essential natural resource from which humans derive considerable biological, economic and societal benefit, and as our closest living relatives they are of special interest to us scientifically.

Despite their value, great apes are widely predicted to become extinct across most of their natural range within a generation. Modern zoos must therefore act as 'arks' so that carefully managed populations of great apes continue to exist into the future and can be released into the wild if suitable habitat still remains. Twycross Zoo, the only UK zoo to house all four types of non-human great ape, is undergoing redevelopment to modernise. It aims to be an international leader in evidence-based management of great apes and to become the centre for research and excellence in Science, Technology, Engineering and Maths education (STEM) in Europe for primate care, conservation and research.

Led by Dr Susannah Thorpe and funded by The Natural Environment Research Council (NERC), an internationally-unique group of researchers in the school's of biosciences and psychology, are working with Twycross Zoo and BIAZA (the representative body of zoos and aquaria in the UK) to develop an innovative enclosure design tool. This tool will enable zoos to engineer into their great ape enclosures the same physical, social, cultural and cognitive challenges and opportunities as wild environments offer, to produce apes that are anatomically and behaviourally comparable to their wild cousins. Many of the benefits expected from the project will have impact across the UK zoo sector and can ultimately be translated on a global scale.

'Twycross Zoo is proud to be at the forefront of great ape Conservation, as a member of the Grasp UN initiative, and the only UK zoo breeding and keeping all four great ape families. The collaboration with the University of Birmingham provides an opportunity for an international Centre of Excellence at Twycross Zoo.'

Sharon Redrobe CEO, Twycross Zoo

School of Biosciences

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think infrastructure

Putting in **the Groundwork**

The University of Birmingham will establish a National Buried Infrastructure Facility (NBIF) as a part of the UK Collaboration for Research in Infrastructure and Cities.

The NBIF will enable scientists to test a variety of buried infrastructure systems at, or near to, full-scale to help them understand their physical and operational performance. This includes, for example, pipelines and cables, culverts and tunnels, road foundations and barrier wall systems.

This knowledge will provide the scientific evidence base to inform decisions on innovative engineering of new infrastructure systems, cost-effective maintenance and adaptation of existing infrastructures, and building in resilience to cities' infrastructure systems in the face of increasing demands and the extreme events that are expected as the climate changes. The NBIF consists of a new state-of-the-art building housing a 25m x 10m x 5m deep test pit for testing buried infrastructure systems, pipeline and small-scale structural testing rigs, material characterisation facilities, material storage and test assembly areas, and a visualisation suite and knowledge transfer centre. The award also enables a major upgrade to the University's TRAIN Rig Facility, where scale-model testing of high speed train aerodynamics can be carried out.

The £21m award to establish the NBIF has been made as part of a capital investment by the Department for Business Innovation and Skills (BIS) to the UK Collaboratorium for Research in Infrastructure and Cities (UKCRIC), a collaboration of 14 UK universities which aims to provide a knowledge base to ensure the long-term functioning of the UK's transport systems, energy systems, clean water supplies, drainage and sewerage, waste management, and flood defences and the development of SMART infrastructures.

'We are investing in this world-leading UK research network to develop new materials and engineering solutions that will deliver world-class infrastructure up and down the country.'

Jo Johnson MP, Minister of State for Universities and Science

National Buried Infrastructure Facility

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UKCRIC is one of the largest collaborative research projects in the UK. Partners include: Bristol City Council, Network Rail, Mott MacDonald, Buro Happold, Atkins, National Grid, DfT, EDF and Thames Water.

think environment

Testing the waters

Professor David Hannah, Dr Chris Bradley and research associate **Kieran Khamis** at the University of Birmingham (UoB) have been working with RS Hydro, on an Innovate UK funded KTP project to develop a unique solution enabling real-time field monitoring and analysis of organic pollution. This will enable the data collected in the field to be wirelessly transmitted to distant locations, presenting easy to understand graphical information direct to the business or utility company and enabling them to respond rapidly.

The new system monitors the water's fluorescence, which is used to characterise dissolved organic matter. 'Tryptophan-like' fluorescence (TLF) is a useful indicator of human influence on water quality as TLF peaks are associated with sewage or farm waste and products of its microbial breakdown. Hence, real-time monitoring of TLF fluorescence can potentially identify contamination events at a higher resolution than previously possible. RS Hydro and the University have been working together to test field deployment of the system created by the researchers in the hope this will allow monitoring organisations to react to human or animal-based pollution events in real-time. The project integrates a new sensor system with a telemetry-based data monitoring system, providing a step-change in water quality monitoring internationally.

This new technology provides an ideal platform for further monitoring system developments, potentially leading to a range of new products.

The sensing package has already received interest from academics, water utilities and river basin managers.

Potential new applications of the technology include the early warning of bacterial contamination or breaches in environmental permits (waste water effluent).

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think business *with* Birmingham

Network with us

The University of Birmingham is committed to developing links with industry and one of the mechanisms by which we do this is through our annual Business with Birmingham Conference. Over 150 people from SMEs and large corporates attended our most recent conference and heard from business leaders on two lively panel debates discussing the benefits and challenges of university and industry partnerships. The conference is one of a series of events organised by the Business Engagement Team in order to promote the benefits of collaborating with the University.

The University of Birmingham…

RUNS A BUSINESS **CLUB** THAT HAS ATTRACTED OVER **500** **BUSINESS MEMBERS**

Generates over £1 billion of regional economic activity each year and supports over **11,830 jobs**

Join our business club

The UoB Business Club is a Club for business individuals, who are looking to network and exchange ideas with each other and University of Birmingham academics.

Club members receive invites to our regular breakfast briefings, where they have the opportunity to discuss topical business issues with experts from Birmingham Business School and other departments of the University.

Each briefing also includes the opportunity for members to make short elevator pitches to the audience. These four minute, quick-fire slots are designed for members to promote their new product or service, recruit partners for collaborative R&D, or access peer support for their most pressing business challenges.

Business Engagement

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