

HIGH TECH NEWS

What a great year

This has been, on the whole, a great year for technology in the Bristol & Bath region. With new entrants such as Cray and Oracle (p6), large investments in existing startups such as ClusterHQ (p6) and Ultrahaptics (p3), and new venture funds (p3), there is a distinct feel of optimism. All of this is charted in the roundup that starts on page 6 and shows the strength of the technology development throughout the region in the last year.

There have been significant changes though: we had to say goodbye to NVIDIA, and we didn't win the national centre for smart city research, but this has opened up new opportunities across the region. A new smart Internet Lab at the University of Bristol (p4) and new partners for Bristol is Open highlight how strong the technology is in the region, and this was demonstrated at the recent UN Climate Change conference with the launch of the Bristol Brain (p5).

This optimism is also bringing new conferences to the region, with a cloud technology conference called Voxxed days coming to the UK for the first time in Bristol in February (p14).

Awards season is also upon us, and the region is hosting not one but two in the middle of February, with nominations closing in the first week of January. The Sparkies (p14) and the Edge Awards (p15) are celebrating all the great technology, innovation and people in the region, and the emergence of two such award programmes highlights how far the region has come in a few years.

Invest in Bristol and Bath are also looking for Ambassadors region to help boost the profile of the region (p12), and there are opportunities for small companies in the regional to access government contracts through a new Digital marketplace (p13). For more information about the High Tech activity in the region, please sign up for the newsletter at www.swinnovation.co.uk

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The High Tech News banner highlights the expertise in the region, from the robotics capabilities of XMOS, Infineon and the Bristol Robotics Lab, the chip design heritage of the Inmos transputer and live Android image processing code shipping in products today

SETsquared named world's best university business incubator

SETsquared has been ranked by UBI Global as the top university business incubator in the world. The partnership of the universities of Bath, Bristol, Exeter, Southampton and Surrey was recognised as the best performing university business incubator on the globe. In the last 13 years, it has supported over 1,000 hi-tech start-ups to develop and raise more than £1bn of investment, as well as contributing over £3.8bn to the UK economy with further £15bn contribution estimated over the next 10 years. The partnership currently supports 265 companies across its centres and has created over 9,000 new jobs.

It was ranked alongside some of the world's best university business incubators, including the Innovation Incubation Center at Chaoyang University of Technology, Taiwan and The DMZ (Digital Media Zone) at Ryerson University, Toronto.

"It's incredible to be recognised as the top university incubator in the world, and we're all delighted by the news," said Simon Bond, innovation director at SETsquared and director of the University of Bath Innovation Centre (UBIC). "Team SETsquared' has worked extremely hard to fulfil our commitment to helping entrepreneurs and start-ups and this top ranking is a real testament to the skill of our staff and the success of the high-tech, high growth potential ventures we work with. The UK was recently ranked as the second most innovative country in the world by the Global Innovation Index for its performance in infrastructure, market sophistication, knowledge, technology and creative outputs, and SETsquared is very proud to have played our part in putting the UK on the map as one of the top performing countries for innovation."

SETsquared's work includes schemes such as the Entrepreneurship Training Programme, which helps entrepreneurs turn their business ideas into investor propositions; Researcher to Innovator, a three-day residential course to help early stage researchers acquire the skills to turn projects into commercial realities; and the ICURe Innovation to Commercialisation Programme, which is funded by InnovateUK and HEFCE, to help market validate commercialisation opportunities from research. It is based at the EngineShed in Bristol and at the Innovation Centre in Bath.

The UBI Index is the first global index to benchmark the performance and best practice of university business incubators. The organisation already held continental rankings around the world, culminating in the global ranking. Dhruv Bhatli, Co-founder and Director of Research at UBI Global, said: "We're delighted to see SETsquared be named as the best in the world. The partnership's continued dedication to entrepreneurs and start-ups has resulted in high economic impact and growth for the companies it supports."



Ultrahaptics raises £10m to reach new markets for ultrasound touch

Bristol University spinout Ultrahaptics has raised over £10m (\$15m) for the development of its ultrasonic touch technology.

The new investment, led by Woodford Investment Management, will allow the company to work with manufacturers in different markets as well as reaching new markets and customers.

The system uses ultrasound to project sensations through the air and directly onto the user, revolutionising how people interact with computers, automobiles and consumer goods. Users can feel touchless buttons, get feedback for mid-air gestures or interact with virtual objects.

The technology is already being licensed into various markets including consumer electronics, household appliances and the car industry. "The company is engaged with Tier 1 manufacturers in multiple markets and the investment from Woodford Investment Management will allow us to fulfil this demand and address additional markets and customers. Our technology completes gesture control by re-introducing the sense of touch," said Steve Cliffe, CEO of Ultrahaptics.

"Ultrahaptics joined the Bristol SETsquared Centre in November 2013 and has grown rapidly in the centre, here in Engine Shed, to a team of over 20 people. We are hugely excited to be working with them and being a part of their journey," said Nick Sturge, Director of the Bristol SETsquared Centre. "This could be one of the most exciting stars coming out of the Bristol and Bath ecosystem and we look forward to the ride. Their success reflects the ambition in the city-region and the complimentary activities of the University of Bristol, SETsquared and Invest Bristol & Bath, who are helping them with their growth plans in the city."

Mark Reilly of existing shareholder IP Group plc added: "We have been involved with Ultrahaptics from the very beginning and have been delighted with both the technical and commercial progress achieved to date. We are extremely excited to participate in this Series A funding and the company's continued development."

www.ultrahaptics.com

Venture funds blossom

New funds are looking to support technology startups in the region. The £10m Great Western Venture Fund is backed by London-based venture capital firm Downing and legal firm TLT, while the University of Bristol has set up a £2m seed fund backed by graduates from the University.

Downing highlights Bristol & Bath as one of the most attractive places for investment in startup companies in Europe. Since its launch just over a year ago, Downing Ventures has invested almost a third of its entire portfolio in startups based in the area.

Downing's Investments include a diverse range of high-growth web-enabled businesses such as Duel, a competitive photo sharing social network, Zenstores, which provides order management and fulfilment software for small ecommerce businesses, Habu, a room-booking and resource management platform, Nursery Book, an integrated app for managing children's nursery administration and reporting, and Natter, a new social network based on the principle of three word status updates.

"London attracts the majority of the UK's venture investment, with far fewer private investors looking outside the capital to find exciting opportunities. However, we believe that there are significant growth opportunities in the South West. Fantastic talent, quality office space and great facilities that are more affordable, means that investment capital stretches significantly further," said Matt Penneycard, Head of Downing Ventures.

Downing has formed a close partnership with Webstart Bristol, the early stage tech incubator for web and app startups which is recognised as being one of the best in the UK. "Tech giants such as HP, Toshiba, IBM, Sony, Amazon and JustEat, to name a few, have a presence in the South West. There are fast-growing and prospering digital agency, gaming and animation clusters here, and it also has the highest number of new business startups in the UK after London. In conjunction with our partners in Bristol and Bath we are working hard to identify, inspire and support the next generation of tech entrepreneurs," said Penneycard.

www.downing.co.uk/ventures

Bristol launches Smart Internet Lab

A new research centre at the University of Bristol is intended to become a world leader in communications, digital and autonomous systems research.

The Smart Internet Lab will build on the University's major communications and digital technologies research to create and permanently support a hub for internet research that will have long-lasting benefits for society and the economy.

"Academics and researchers at Bristol will join forces to turn our unique communications know-how into a comprehensive understanding of how the world will use digital technologies in a smart way — and how it will change our future," said Professor Dimitra Simeonidou, Director of Smart Internet Lab and chief technology officer of Bristol is Open.

The Smart Internet Lab will build on research in the areas of network infrastructures technologies and context-driven networked services. Researchers working on network infrastructure study both fixed networks and wireless and sensor networks and context-driven networked services includes autonomic systems and intent-based services. The University will also host a large-scale technical test bed with future Internet technologies that is open to industries.

Professor Nishan Canagarajah, Pro Vice-Chancellor for Research, said: "International leadership and excellence in communications and networks is one of the key research strengths of our University. The establishment of the Smart Internet Lab signifies a strategic commitment by the University to continue to support and grow research in these areas, establish innovation partnerships in this region and reinforce our worldwide leadership in smart cities, 5G, optical networks and cloud technologies."

Professor Andrew Nix, Dean of the Faculty of Engineering, added: "The Smart Internet Lab brings together more than 200 engineers and scientists with a shared passion for large-scale, transformative and socially relevant research. Uniquely, the Lab fuses expertise across the boundaries of wireless, networks and photonics. In doing so the Lab has the critical mass to address the complexity and challenge of tomorrow's digital world."

The new research centre will focus on: fixed, mobile and wireless networking; data centre networks; sensor networks and Internet of Things; smart cities; software defined networking and network virtualisation; cloud computing; security; service and knowledge management. Work carried out at the centre will also develop into internet-related research within the field of humanities and social sciences.

www.bristol.ac.uk

Lessons of the Future City

InnovateUK chose the Bristol Festival of the Future City to launch its Future Cities Demonstrator report and invited a panel of Urban Living experts across the UK to discuss the benefits and disadvantages of city demonstrators.

Mike Pitts, Head of Urban Living and Built Environment at Innovate UK, kicked off the discussion by telling us that the Future Cities Demonstrator competition £50,000 feasibility studies were a successful initiative: There was £107 million in additional private and public investment for Belfast, Bristol, London, Peterborough and Milton Keynes to make parts of their studies a reality and at least three-quarters of the local authorities have taken forward some aspects of their bids by the end of 2013.

The prize of £24m (which went to Glasgow) was large enough to entice cities to bring together in collaboration local authority departments that previously worked in silos and local businesses, and the act of writing the feasibility study provided a consortium with space to think, and once the plan was written up everyone involved saw the benefits of the projects. Those cities that didn't win the competition used their feasibility studies as business cases to secure alternative funding from Europe and the private sector.

www.innovateuk.gov.uk

Bristol is Open boosts partners...

Smart city networking testbed Bristol is Open has added two new partners, bringing projects from Rolls Royce and technology licensing firm InterDigital.

As a Project Partner in the UK's first interactive Data Dome, Rolls Royce will investigate the use of the fully immersive hemispherical display system in the 100-seat facility, for high-end visualisation of its products and associated big data. The first visualisation is of the Trent XWB, the world's most efficient aero engine.

"Visualising and creating value from a wealth of data is really important to us, and this partnership provides us with a great opportunity to tap into the Bristol and Bath area's rapidly growing innovative digital media capabilities. It's also a great opportunity to engage and inspire young people with immersive sound and vision experiences of our products and show them how exciting engineering can be," said Paul Stein, Chief Scientific Officer at Rolls-Royce.

Housed inside At-Bristol Science Centre's Planetarium, the Bristol Data Dome is the only projection environment in the world connected to a city-scale high performance network and a high performance computer and is one of the highest definition digital projection environments in the UK today.

"Our world is overwhelmed by data, making a lot of it inaccessible and unintelligible. Visualising data in a shared environment like the Bristol Data Dome enables people to identify new patterns, and jointly examine new ways of seeing the world, the city, and products and services," said Paul Wilson, Managing Director of Bristol Is Open. "Rolls-Royce has understood this, and been quick to spot the opportunity the Data Dome provides. We're very pleased to announce this partnership with them, and to exploring similar partnerships with others."

Mobile technology research and development company InterDigital licenses key patents for wireless systems and has also joined Bristol is Open.

"Bristol Is Open is an exciting initiative with a vision that aligns perfectly with InterDigital's 5G and IoT focused research and development efforts. Collaboration on this innovative project serves as another positive example of InterDigital's strong and open innovation model," said Alan Carlton, Vice President of InterDigital Europe.

... as the Bristol Brain is proposed

Bristol is aiming to create a 3D-printed large-scale city model that can have real-time data and sophisticated analytics projected onto it, for example, showing real-time pedestrian and traffic flows; the energy use of buildings or even the air quality at different times of the day or night and at different times of year.

The really ambitious part is to make the model into an immersive digital environment that will utilise virtual and augmented reality and haptic technologies to allow people to 'leap-in' to the city model. Bristol citizens will be able to experience new developments before they are built and see how they impact on the city's systems. This will allow different scenarios for future developments to be explored as if they are real, and for the impact on energy, transport, air quality, noise, light and other factors, to be fully understood.

Bristol is well placed to develop a city 'Brain' as a large investment has already been made in hardware and software in Bristol is Open to create a city research and development platform.

Bristol can pioneer this approach thanks to its credentials as a high tech and sustainable city, says Stephen Hilton, Director of Bristol City Council's Bristol Futures team, with two leading universities and businesses at the cutting edge of developing technologies that utilise data, augmented reality, sensors, analytics, visualisation, virtual environments and interactive digital media.

The project was announced at the 2015 UN Climate Change Conference (COP21) in Paris, and Bristol City Council is now seeking £10-15m investment to build the full model in such a way that it can be openly shared with cities around the world.

www.bristol.gov.uk

2015 boosts region as major tech cluster

- *Bristol confirmed as the largest digital cluster and fastest growing city outside London*
- *Smart City status confirmed with key European projects and the launch of Bristol is Open*
- *Strong legacy from the European Green Capital boosts research into the Internet of Things.*
- *Cray and Oracle invest in the region*

The past year has seen some key developments for the growth of technology in the Bristol and Bath region. Global computing giants Oracle and Cray have set up regional research groups and even their European headquarters, while home grown ventures have shown they can raise tens of millions of dollars in funding. The region's technology incubators are confirmed as the very best in the world, and our university researchers are leading the global developments of technology such as quantum computing and 5G.

Companies in Bath based at the University of Bath Innovation Centre (UBIC) and Bath SETsquared have raised £20.5m this year, a big increase on the £12m in 2014.

The Bristol and Bath Science Park is moving to its second phase, with the first stage showing the success of the model. Of the 39 companies in the Innovation Centre, 27 were doing business with each other and of these, 21 were doing business with four or more other tenants. These connections have all been made since coming to the Science Park.

Meanwhile the EngineShed in Bristol is expanding with the BoxWorks and new investment funds to support startups.

Here's a reminder of selected high points from the last year:

February saw the region named as the biggest cluster of digital technology outside London in an influential report by Tech Nation.

"Tech Nation shows that digital businesses are driving the economic growth of Bristol & Bath," said Bonnie Dean, chief executive of Bristol & Bath Science Park and head of the Tech City Cluster Alliance in Bristol & Bath. "Our specialisms in network infrastructure and systems design are developing a reputation for digital excellence that is attracting talent and finance to the area. The combined support of established digital companies, local academic institutions and local government will ensure growth continues in our cluster for years to come."

At the same time, ClusterHQ raised \$12m to expand its software for cloud applications in a key deal that boosted the region on the world stage. The funding was led by venture capital firm Accel Partners London, with participation from Canaan Partners as well as existing investors. These include leading software industry figures, from the former VP of engineering at Rackspace Cloud Jason Seats, veteran Bristol tech innovator Charles Grimsdale, now partner at Eden Ventures and former CEO and founder of Peter Gabriel's music download firm OD2, to the former head of corporate development at Google EMEA Anil Hansjee and Toivo Annus, former head of engineering at Skype.

March saw the launch of the second generation multicore chips from XMOS in Bristol, promising high performance for the fast growing market for the Internet of Things for just \$5, closely followed by a \$2 audio chip. Test and Verification Solutions (TVS) moved into security testing in a partnership with ESS and was part of the verification process for Blu Wireless Technology.

April saw Micrima gain the coveted CE mark for its innovative scanner for detecting breast cancer, which would go on to appoint a new chief technology office in Dr Peter Bannister and be deployed in pre-commercialisation clinical trials based at several breast cancer imaging centres throughout the UK as it reaches its tenth year in operation.

May saw global supercomputer leader Cray set up its new headquarters for Europe, the Middle East and Africa (EMEA) at Broad Quay in Bristol, followed by its European research and development centre.

This is serving as a regional base for its EMEA sales, service, training and operations with 30 staff, and as an important development site for worldwide R&D initiatives, doubling to 60 over the next year. The new headquarters will also provide the company with a centralized location for

business engagements with new and existing customers, enhancing Bristol & Bath's position as one of the world's leading technology hubs.

"The EMEA market is one of our fastest growing regions and as we continue to expand with new customers, partners and employees, and further advance our R&D programs in Europe, now is the perfect time to centralize our operations in Bristol and provide a platform for continued growth," said Peter Ungaro, president and CEO of Cray which is based in Seattle. "Bristol is a great city with leading universities, and is quickly becoming a technology hub with a number of large high-tech companies and startups and a skilled workforce. The city is an ideal fit for our growing company and we are excited to be a part of the Bristol community."

The new 4K hemispherical Data Dome at the @Bristol Science Centre also opened to the public and business to showcase new ways to interact with large amounts of data.

The Dome, funded by Bristol City Council and Bristol is Open, connects via the terabit fibre network to the supercomputer at the University of Bristol to overlay data on high resolution video. This is being used for stunning astronomical flythroughs in the Planetarium, and can be used for other applications, and two showcase applications have been commissioned. These are looking at original and creative approaches to using Bristol City Council open data plus other publicly available open data sets, as well as ideas on engaging with an audience with relevance to the locality of Bristol.

"By upgrading the Planetarium to create a state-of-the-art city data visualisation facility, we are developing something world leading and unique for Bristol citizens and businesses," said Stephen Hilton, Director of Bristol Futures at Bristol City Council. "Data is increasingly an important city asset and being able to visualise it in new, highly dynamic and interactive ways will showcase the creative digital skills, which are one of the city's greatest strengths"



The Dome (above) uses an Evans & Sutherland Digistar 5 full dome 360° digital 3D projection system from two projectors, and 7.1 surround sound, creating a fully immersive experience. Skypoint Planetariums, Evans & Sutherland's European representative, is providing the new equipment and managed the installation.

But we also saw the closure of one of the region's leading technology companies. NVIDIA bought Icera Semiconductor in 2011 but announced the closure of its modem operation, mostly based in Bristol, in May. This has opened up opportunities for skilled hardware and software engineers in other silicon and embedded software companies across the region.

June saw the Venturefest technology festival come to the PassengerShed at TempleMeads in Bristol.

The programme included an Innovation Showcase, with the region's most exciting and innovative companies across four key sectors: advanced engineering; hi-tech, ICT and microelectronics; digital & creative and city innovation, will be showcasing their innovations. These included Airbus with the latest electric aircraft; Renishaw with a 3D-printed titanium bicycle; the

VENTURER Consortium with the driverless Wildcat LandRover (below); HP's Sprout 'immersive computer'; and Open Bionics and their 3D printed robotic hand using recycled plastic.



The Start-up Village has 20 of the region's most promising and innovative early stage businesses that have been shortlisted to showcase their innovations, including the finalists in the Green Capital Digital Challenge.

Blu Wireless Technology showed its Lightning demonstrator in June at the Small cells conference in London. This was the first physical manifestation in a development roadmap that will see the technology applied to WiGig and ultimately millimetre wave modems for the emerging 5G mobile standard for linking small cells together.

Lightning has been installed as part of the Bristol is Open experimental network in order to demonstrate gigabit-speed wireless mesh networking for dynamic data backhaul applications. This is the first mesh network trial in Europe to use 60GHz and OpenFlow software defined networking.

"Blu Wireless has attended the Small Cells Back Haul conference for the past three years and this is the first time we will be demonstrating our HYDRA baseband technology for backhaul and related applications. We see this as an important validation of our technology and are planning further enhancements and developments for release in the next 12-18 months," said Mark Barrett, chief marketing officer.

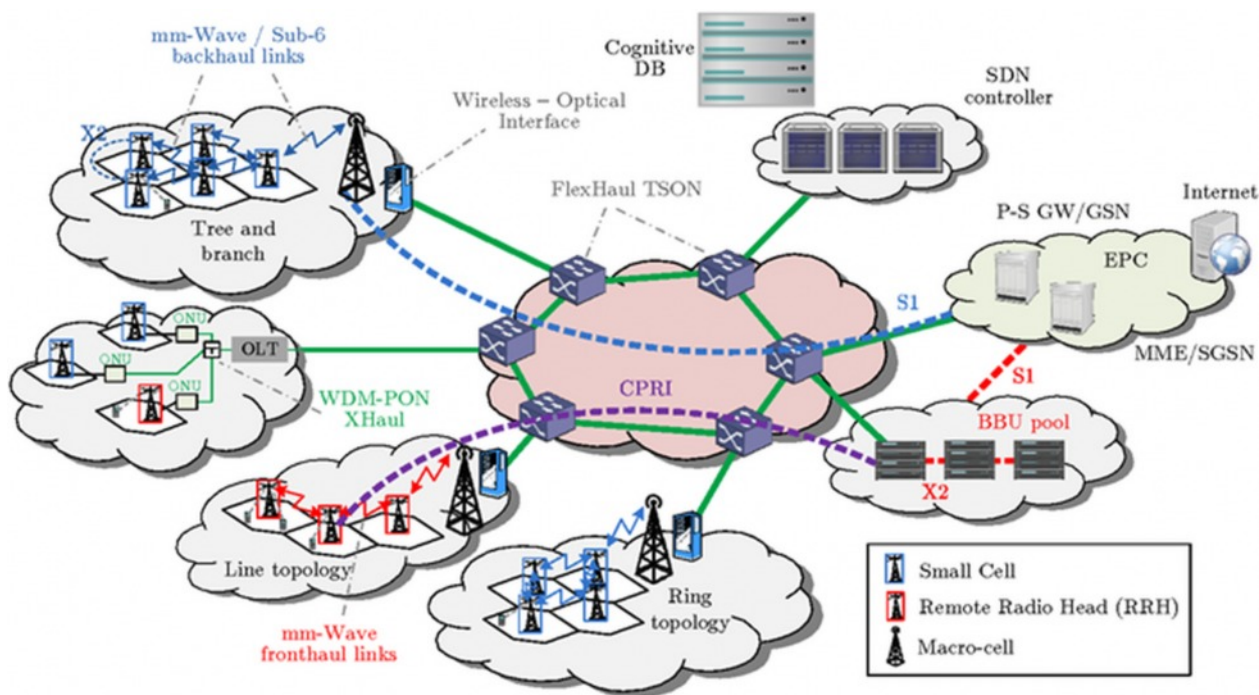
The Quantum Information Technologies Workshop 2015, hosted by the [Centre for Quantum Photonics \(CQP\)](#) at the University of Bristol in June saw the launch of the [Quantum Engineering Technology \(QET\) Labs](#) that will house over 100 researchers. The labs host unique world-leading facilities and aims to bring together industrial and academic collaborators to build new devices that span numerous areas of quantum technology development. This includes everything from the nano-fabrication of quantum devices to a city-scale quantum key distribution network.

The QET labs will span the faculties of Science and Engineering in order to deliver "a radically new generation of machines that exploit quantum physics to transform our lives, society and economy," said the Director of the CQP, Professor Jeremy O'Brien. "QET Labs will be an international node for collaboration with industrial and academic world-leaders."

The Labs aim to be a global centre for research, development and entrepreneurship in the emerging quantum technology industry.

Bristol researchers are also at the heart of an ambitious pan-European project to evaluate the infrastructure for the next generation of communications networks and services. The £7.3m Horizon2020-funded X-Haul project (above) includes Blu Wireless Technology, Bristol is Open and the University of Bristol alongside companies, research institutes and universities from four European countries. One key focus of the will be on establishing dynamically adaptive communication for transport hubs including railway stations and airports and at major events.

The project (below) is using a combination of optical and wireless technologies to support small wireless cells that can deliver high speed broadband connections to 5G mobile phones. It allows the dynamic allocation of network resources to predicted and actual hotspots to ensure everyone gets a high speed link. Field trials are already underway with Bristol is Open and Blue Wireless Technology and the findings of the project will be used to determine new technology and services across Europe,



“5G-XHaul is an exciting collaboration set up to establish the ways that networks of the future will operate. For Bristol is Open, Blu Wireless is deploying its mm wave technology to extend the fibre network. Millimetre wave wireless technology will form a key aspect of 5G and we are very pleased to be involved with this important project,” said Mark Barrett, CMO of Blu Wireless Technology.

September also saw a Bristol-based operating system head into the data centre. With all the major apps such as Facebook, Twitter and Snapchat hosted in the cloud, the infrastructure of the data centre is a key growth area. Bristol-based software developer WITTENSTEIN high integrity systems (WHIS) has launched a new operating system that allows system builders to develop new functions quickly and efficiently on the Intel servers that dominate the data centre market. OpenRTOS IE is a powerful, small footprint real time operating system (RTOS) and driver software for the Intel Innovation Engine (IE). This is a small Intel architecture processor and I/O sub-system embedded into Intel’s next generations of servers that is being installed in data centres around the world. This can be used for server, storage and networking applications to reduce overall system cost or to improve server performance. The core operating system is just 10Kbytes and the whole things is less than 100Kbytes, maximizing the amount of memory available for the system builder’s application code.

October saw Bristol start to roll out a €25 million Horizon 2020 European project to create integrated smart city solutions to tackle traffic congestion, poor air quality and unsustainable energy use. Working with San Sebastián and Florence, the REPLICATE (REnaissance of PLaces with Innovative Citizenship And TEchnologies) consortium will the project will primarily focus on East Bristol. It also saw the separation of Hewlett Packard into HP Inc and into HP Enterprises which now hosts the 800 staff in Bristol.

November and December have seen the innovation continuing, with new office space at the BoxWorks, the confirmation of SETsquared at the leading university incubator in the world, a £10m investment in Ultrahaptics and plans for a new automotive technology lab at the Science park.

Here’s to 2016!

Thalia Design Automation raises third round to expand into the US

Local chip design tool startup Thalia Design Automation has raised £500K from its existing investors to expand into the US market.

Thalia technology aims to speed up and reduce the cost of analogue and mixed signal chip development through intelligent algorithms to analyse and optimisation both for new designs and IP blocks. The tools set can also be used for design and IP migration from foundry to foundry or across processes for cost reduction. The investors in this third round are Mercia Fund Management, a Midlands-based VC and Finance Wales.

“We had initial products out with customers at the end of last year and we are continuing to move forward in engaging with customers,” said Dr Rodger Sykes, chairman of Thalia. “To get to an optimal design, the Thalia AMALIA technology has to be able to find a solution the size of a sugar cube in an area the size of Jupiter, that takes seriously smart optimisation algorithms”

“One of the really interesting things that we are seeing is that there is a market for design migration automation and I think this is where we have a significant opportunity,” he said. “The medium to large semiconductor players all have portfolios of designs and are continually trading off investing engineering effort to move across process nodes for cost reduction versus using precious analogue design resource on new products. What we are seeing is an opportunity to automate the design migration process from one process node to another or one foundry to another.”

“Customers will want to do some optimisation or updating to reduce power or increase performance so there is an optimisation element, and that’s where we are seeing significant interest, not just the design but also for pieces of IP in the design or an IP house,” he added. “The solution we offer customers is a full migration solution covering both design optimisation and layout.”

This allows valuable and expensive analogue engineers to focus on the more challenging parts of the design in the architecture rather than the handle turning of migration.

“It’s very much a global market and already have a number of customer engagements, mainly in Europe as there is a lot of opportunity and we have been managing costs,” said Sykes. “The funding will allow us to expand to support US engagements initially and then out to Asia.”

www.thalia-da.com

EnSilica sets up analogue design centre

Leading UK chip designer EnSilica has set up a design centre in Bristol to be its centre of excellence for analogue design.

The office and design centre will be headed by Nick Weiner, EnSilica’s Director of Analog and Mixed-Signal Design who joined the company earlier in 2015. Well known within the industry as a founder of Bristol companies Phyworks (sold to Maxim in 2010) and Xintronix (sold to FTDI in 2013), Nick has many years of experience in analogue and mixed-signal IC design management and business development. Nick has specialist knowledge in products developed for the fibre-optic communications, including industry-leading FTTH transceivers, 10Gbps transceivers and signal integrity ICs.

“The opening of our regional office and design centre in Bristol (UK) is a further strategic step in the ongoing development of our semiconductor design and supply business,” said Ian Lankshear, CEO of EnSilica. “Not only will it bring us closer to customers in the area but it will also further extend our existing turnkey ASIC, FPGA and embedded design capabilities, providing us with a more flexible and scalable analogue and mixed-signal IC design resource for customer projects that require larger teams to accelerate timescales and deal with increasingly complex projects.”

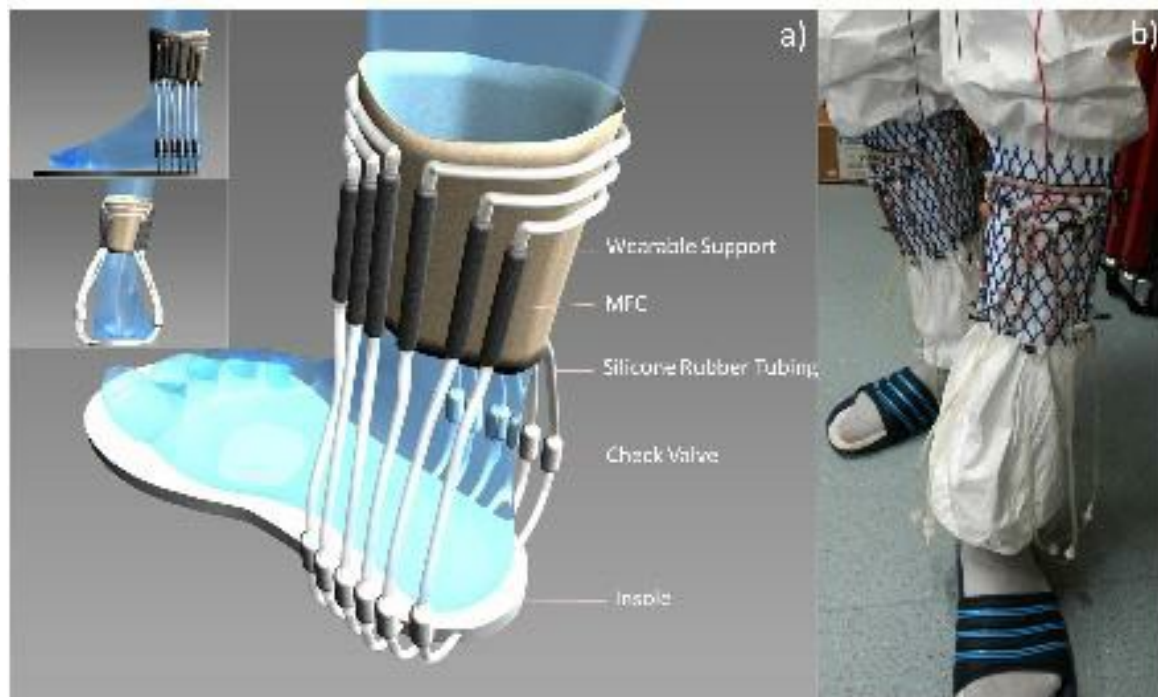
The Bristol office will also support local silicon companies using EnSilica’s IP designs and complements its existing headquarters facility in Wokingham and verification centre of excellence and design centre in Bangalore, India.

www.ensilica.co.uk

Powering a wireless network with urine

Researchers at the University of the West of England (UWE) have demonstrated the first wireless transmitter powered by urine.

The technology uses Microbial fuel cells (MFCs) that replicate biological processes to generate energy, and the researchers have embedded the technology in a pair of socks.



The key is that the MFC takes in urine and produce enough energy to power a wireless transceiver, creating a personal area network (PAN) link without having to use batteries. This is the first self-sufficient system powered by a wearable energy generator based on microbial fuel cell technology and the project is led by Professor Ioannis Ieropoulos, of the Bristol BioEnergy Centre, based in Bristol Robotics Laboratory.

Soft MFCs embedded within a pair of socks was supplied with fresh urine, circulated by the human operator walking. Normally, continuous-flow MFCs would rely on a mains powered pump to circulate the urine over the microbial fuel cells, but this experiment relied solely on human activity, which is a key step forward (pun intended). The action of walking caused the urine to pass over the MFCs and generate energy and the system successfully ran a wireless transmission board to send a message every two minutes to the PC-controlled receiver module.

“Having already powered a mobile phone with MFCs using urine as fuel, we wanted to see if we could replicate this success in wearable technology. We also wanted the system to be entirely self-sufficient, running only on human power – using urine as fuel and the action of the foot as the pump,” said Prof Ieropoulos. “This opens up possibilities of using waste for powering portable and wearable electronics. For example, recent research shows it should be possible to develop a system based on wearable MFC technology to transmit a person’s coordinates in an emergency situation. At the same time this would indicate proof of life since the device will only work if the operator’s urine fuels the MFCs.”

Microbial fuel cells (MFCs) use bacteria to generate electricity from waste fluids. They tap into the biochemical energy used for microbial growth and convert it directly into electricity. This technology can use any form of organic waste and turn it into useful energy without relying on fossil fuels, making this a valuable green technology. The research is important in other areas of robotics as it would allow autonomous systems to generate power from waste materials to operate for days or even months at a time. The challenge now is how the MFC cells are refuelled with urine.

SIGs boost collaboration in the region

The Special Interest Groups (SIGs) managed by High Tech Bristol and Bath are catching the imagination of technology companies both within the region and out in the wider industry .

A new group focussed on technologies for Cloud computing is bringing together companies such as Oracle, IBM, HP Enterprise, BrightPearl and ClusterHQ with several work streams. The SIG has been a key part of the development of the first Voxxed Day technical conference to come to the UK, and details of the programme will be announced in early January. There are more details in the events section on page 13 including the three main tracks.

Other SIGs include High Performance Computing and Embedded Software, as well as Education and Skills, and there is interest in a 'Drone' SIG to bring together the developers of UAVs in the region and researchers working on hardware and software technologies, as well as operators and potential customers who want to solve specific problems. There is also interest in a SIG around health technologies to provide a framework for companies to work in partnership with the other healthtech groups in the region.

The local community coding activity of the education SIG is progressing well with two sites in Barton Hill and now in Southmead, and there is significant interest from community clubs and schools for more activity.

Joining HBB allows members of your company to attend any of the SIG meetings and have a say in the direction and output of the groups.

If you are interested in joining any of the SIGs, please contact John Bradford at john.bradford@hbb.org.uk or Nick Flaherty at nick@flaherty.co.uk.

Region looks for business ambassadors

The Invest in Bristol and Bath inward investment agency is looking to set up and support a network of business ambassadors to help promote the region.

Business leaders, students, visitors and residents are the most powerful, passionate and authentic advocates of any town or city, says Matt Cross, head of inward investment at IBB. People who live and breathe Bristol and Bath get the message across better than any other form of advertising or promotion, and he gives the example of Tom, who runs a small, leading digital agency in Bath. He set the business up here after graduating from the University of Bath and knew he could get the talent and have a great lifestyle. But the majority of his clients are in London.

At times Tom has to justify why he is not in London. Why is a leading law firm on the 35th floor Canary Wharf hiring a small agency from a West Country city that is known for its impressive architecture, great shopping and a decent rugby team?

If Tom is going to get the business he is going to have to start changing these perceptions.

He is going to be telling his clients that the quality of talent is second to none in Bristol and Bath. He will tell them about the accessible cluster and networks, unlike anything in London. He will tell them about his amazing lifestyle making the most of two diverse cities, quality schools and easy walk to work.

This sort of personal testimonial is dynamite and is repeated countless times, from every different type of business with every different type of client. Cross wants to build a network across Bristol and Bath that empowers people who are doing it anyway to sell the region, giving them the tools and knowledge to go alongside their own personal story to give credence to their story.

It's a big challenge so Cross is starting small. In the coming weeks IBB is trialling new tools that will then be made more widely available to businesses. This will include special feedback channels so if one of the Ambassadors finds a company that might want to set up in Bristol and Bath, IBB has a way of coming in and supporting it. The network will also include regular communication to the Ambassadors so that they can stay on top of what is happening and what will be happening next.

If you feel you could contribute, please email invest@bristolandbath.co.uk.

Government opens up digital services to regional SMEs

The UK government is to launch a new framework to allow small digital developers in the regions, especially the SouthWest, to bid for work. This is a major opportunity for small companies to bid for government contracts, and there is a deliberate focus on regional companies.

In February 2016, the Government Digital Service (GDS) and the Crown Commercial Service (CCS) will [replace Digital Services 2 \(DS2\) with Digital Outcomes and Specialists \(DOS\)](#). All suppliers who are currently on the DS2 framework will need to apply to Digital Outcomes and Specialists, and small suppliers that found DS2 too time-consuming are being encouraged to apply for the new framework.

The aim of the Digital Marketplace is to make the commissioning process simpler, clearer and faster. Buying and selling through the Digital Outcomes and Specialists framework will reduce the time and cost traditionally associated with procurement and allow buyers and suppliers to talk to each other so they can decide whether there is a good fit.

This will be broken down into four separate categories, the first being suppliers who can provide teams to build and support a digital service. A digital outcome could be a discovery phase to create an information systems vision of an NHS department. This can include performance analysis and data, security, support and operations, testing and auditing or user research.

The second category is Digital Specialists who can work on a service, programme or project. A digital specialist's work must have deliverables and a defined scope. This could include a business analyst, content designer or copywriter, cyber security specialist, developer, technical architect or product manager.

The other two categories are aimed at suppliers who can offer user research-related services, from user research studios to user research participants.

One way the application has been simplified is that the majority of the evaluation of suppliers won't be carried out at the application stage as it was with DS2. As each buyer has specific requirements, they'd prefer to evaluate suppliers themselves. As a result, under the new framework, most of the supplier evaluation will be done by buyers when suppliers respond to a brief for a specific piece of work. However, buyers may use the information that suppliers provide on their services in their application to help them evaluate. There will also not be a cap on the number of suppliers on the framework, so there are significant opportunities for smaller companies in the region to benefit from government contracts.

The draft Invitation to Tender (ITT) documents were published this week, including the framework agreement, supplier declaration and the service description questions. The Digital Outcomes and Specialists framework is now open for applications in December 2015, and suppliers can create an account using the 'create supplier account' link in the main navigation on the [Digital Marketplace homepage](#).

South West Investment Survey

The group that bought you the Silicon Gorge Investor Pitches are currently undertaking some research in the region to identify the amount of money that has been invested into the region's tech businesses over the last three years, and also what these companies are currently looking for, to help plan investment activities and demonstrate the potential in the region to global investors. "As one of the UK's largest and fastest growing Tech Clusters we're attracting an awful lot of interest from outside investment, said Nick Sturge, Director of Engine Shed and SETsquared. "It's important to be able to demonstrate how far we've already come in terms of the companies that have been supported– and what the likely funding needs will be over the next 12- 24 months" The aim of the data arising from this survey will not only be to help the Silicon Gorge team plan the next best time to hold their pitching competitions, but also to provide enough information upon which local or regional investment funds can be developed to further support local Tech businesses.

EVENTS & AWARDS

Verification Futures

The Verification Futures conference, organised by Bristol-based Test and Verification Solutions, has attracted over 1,800 verification professionals from hundreds of different companies and 30+ countries. In 2015 the event almost doubled in size, attracting over 360 attendees and VF2016 promises to be even bigger with more presentations, more EDA vendors and more users. VF2016 is free to attend and has added a dedicated session on Safety added to the existing ASIC and FPGA tracks.

It is being held on Thursday 4th February, 2016 at the Holiday Inn in Reading and online. The Outline Agenda and Pre-Registration are online now and the final line-up of speakers will be published in in early January.

www.testandverification.com/conferences/verification-futures/vf2016/

Voxxed Days comes to Bristol

Launched earlier this year, Voxxed Days is a new initiative from the Devoxx software developer community, and the first in the UK is coming to Bristol on 25th February 2016 at the Watershed.

Voxxed Days is a series of tech events organised by local community groups and supported by the Voxxed team. Sharing the Devoxx philosophy that content comes first, these events see both internationally renowned and local speakers converge at a wide range of locations around the world.

The Bristol Voxxed Days is spearheaded by High Tech Bristol and Bath (HBB) and the Cloud Special Interest Group, which means the event retains a unique regional flavour, whilst being part of the overall Voxxed movement. Three hundred software developers will be joining a world class set of speakers at the Watershed in Bristol for a fascinating programme including 3 parallel tracks - Cloud Architecture, Cloud Data, and Programming. Conference attendees will get full access to 18 talks and 3 track keynotes, exhibition hall, lightning talks, food and drinks.

Luke Marsden (Founder/CTO, ClusterHQ) will open the cloud architecture track with a keynote covering the challenges of managing storage and data lifecycle with container architectures. The track will also see talks from James Strachen (Senior Consulting Software Engineer, RedHat) on the continuous delivery of micro-services with Kubernetes, along with talks on the core concepts of Kubernetes, containerisation, and micro-services architectures.

The Cloud Data track will see talks and demonstrations from Karthik Rajan (Oracle VP and Architect, Big Data Cloud Services) on the design of enterprise cloud data infrastructures along with Andy Seaborne (VP/Architect Apache Software Foundation) on RDF and Property Graphs, and Steve Loughran (R&D Engineer, HortonWorks) on Hadoop and Kerberos.

The programming track will see talks on Java, JDK9, as well as sessions on functional programming including Erlang, and the use of Scala for Internet of Things projects - with live demos from Johan Janssen (Java Architect, Info Support).

Interested in sponsorship and joining the exhibition? Please contact john.bradford@hbb.org.uk
voxxeddays.com/bristol16/

Sparkies celebrate region's tech...

Nominations are open for the Sparkies awards, which will be held on February 17th 2016. With 15 categories, the awards will recognise the very best digital and tech projects, companies and individuals in the region. Nominations close on January 7th, and the categories are:

The Biggest success story award recognises the company, organisation, project or individual that really made the most of the last 12 months and saw a high level of success.

Future Spark recognises a member of the digital community who is 21 or under and has gone above and beyond in the digital sector.

The 'Totally Killing it' award is for competing globally from Bristol & Bath. The company having the biggest global impact, based in the South West.

The Best startup award is sponsored by Microsoft, while the award for the Most innovative use of hardware looks for a company, project, organisation or individual that has created a new device, project or service that uses hardware in an innovative way. This can be anything from robotics to the internet of Things including amazing product design.

The award for Long-term contribution to innovation in the South West is sponsored by EngineShed and can be a company or individual that represents the 'best tech ambassador for the west' while there are also awards for best mentor and entrepreneur of the year.

There are other awards for Best innovation in digital entertainment, the best use of technology for doing good, covering green tech, sustainable tech and hardware for assisted living, best service provider, mobile app and interface design.

[Nominate someone for the Sparkies](#)

... along with the Edge Awards

Nominations for The Edge awards, sponsored by the University of the West of England and Renishaw among others, also close in early January, on 8th. These provide a stage to celebrate, recognise and reveal the region's finest in design, gadgetry and entrepreneurialism in Bristol, Bath & Gloucestershire. The awards will showcase businesses and individuals across all creative disciplines, from branding to innovation, products to interactivity with a commitment to recognising and rewarding the very best in design, gadgetry and technology.

The awards will be presented on Wednesday 24 February 2016 at the Paintworks in Bristol.

Categories include Innovator of the year, emerging tech, best product of the year, creative technology ambassador and green tech of the year.

www.theedgeawards.co.uk/

Local push for Code Clubs

Bristol's Code Club is looking for volunteers to help with coding in schools. These are funded, volunteer-led after school clubs to get children aged 9 - 11 excited about digital making and are free to host venues and children. The children learn to make animations, build websites and create computer games using Scratch, HTML/CSS and Python. Everything needed to run a Code Club is provided including learning materials, certificates and more. Across the South West there are currently around 300 clubs, and this is influencing the way coding is taught in schools in Bristol within the new primary curriculum:

There is a strong and growing community of volunteers, including supported volunteering from organisations such as Met Office in Exeter, JP Morgan in Bournemouth, Lloyds Banking Group in Bristol, GCHQ Cheltenham, DVLA in Swansea and many SME and micro-businesses within the technology sector. The commitment is normally one hour per week during school hours and you can buddy-up with another volunteer so, if work commitments get in the way, there is always someone to help out. In a school environment there will always be a teacher in the room as well.

If you can help out with a Code Club in your library, community centre or church hall, this can also be done through the HBB education and skills SIG with John Bradford, and registering as a volunteer is a simple process through the Code Club website or contact Seemah at southwest@codeclub.org.uk or john.bradford@hbb.org.uk for more information.

About the West of England Local Economic Partnership

The West of England Local Enterprise Partnership supports business growth and is working to attract new jobs to Bristol, Bath and Weston-super-Mare. The structure supports the LEP Board in making it happen, backed by multiple Sector Groups including the High Tech Sector which meets once a month. More information on the vertical and cross cutting sector groups is [here](#). For more information or to get involved join [the LinkedIn group](#) and sign up for the [High Tech Sector Newsletter at SW Innovation News](#) for news of events and Special Interest Groups

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