

Collaboration between the Welsh Assembly Government, Swansea University and IBM creates a regenerative buzz in South West Wales

Overview

■ **Business challenge**

To stimulate economic growth in South West Wales and the Valleys by encouraging the development of new employment sectors such as life science, which boost an emerging knowledge economy.

■ **Solution**

The Welsh Assembly Government and Swansea University created a new Institute of Life Science (ILS) at the University's School of Medicine. A strategic relationship with IBM gives access to IBM's own world-class research team and provides the ILS's high-performance IT infrastructure.

■ **Key benefits**

- *Creation of a vibrant business community in South West Wales – Alliance Boots has located its Centre for Innovation in the ILS building*
- *Facilitates medical breakthroughs – over 20 high quality publications in just over a year*
- *Powerful diagnostic and modelling tools reduce time and cost to market of new drugs.*



Many regions associated with traditional heavy industries share the challenge of maintaining employment and wealth when these industries are in decline.

Swansea University is central to achieving one of the Welsh Assembly Government's key strategies to address this challenge – stimulating the knowledge economy by developing sectors such as life science. David Lewis, Director, Blue C at the Institute of Life Science, Swansea University explains: "We want to create a cluster of public and private sector organisations around the University and generate some real vibrancy – working together to create life science expertise that translates into practical public health and commercial opportunities."

Realising the vision

The Welsh Assembly Government secured £1.3 billion of EU Convergence Funding to promote economic regeneration and growth in West Wales and the Valleys between 2007 and 2013. A major focus will be strengthening Wales' knowledge economy and universities such as Swansea University have an important role to play in achieving this goal. Swansea University leads or partners in, a number of major EU funded projects of which the newly opened Institute of Life Science (ILS) within Swansea University's School of Medicine is a key example.

Transforming a local economy through innovation

Business benefits

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- Facilitates medical breakthroughs – over 20 high quality publications in just over a year
- Powerful diagnostic and modelling tools reduce time and cost to market of new drugs
- Eco-design of the ILS building reduces energy consumption
- A technology refresh increased computing power while reducing energy consumption, saving the University around £50,000 annually.

The ILS is a unique collaborative venture between the Welsh Assembly Government, Swansea University and IBM, and has a total investment value of over £50 million. It brings together specialists in medicine, engineering, computing, physics and bioscience in a multidisciplinary environment that pushes traditional intellectual boundaries. Academics are supported by an expert business team focussed on building links with the commercial world to take benefits out to the public at large. With reliance on techniques such as bioinformatics for epidemiology, genetic and molecular research, or medical visualisation for diagnostic body scanning, the ILS requires powerful computing and access to the best knowledge management expertise.

“Our choice of IBM as a partner was a strategic one, and provides a key ingredient that contributes to the strength and uniqueness of the ILS,” says Lewis. “We want, and need, to have wide and deep collaborative links to corporations with a very strong research base and unimpeachable brand recognition. We chose IBM because it offers a complete package including brand and marketing expertise, a full range of hardware and software services, a strong research function and an existing focus on healthcare and life science.”

World beating speed

The ILS houses IBM's “Blue C”, one of Europe's fastest computers dedicated to life science research. Its impressive performance is used to run simulations of epidemics, analyse viral genomes and construct images from CT scans. One project is analysing the large amounts of genetic data held on publicly available databases to plot the evolutionary history of many human viruses.

Access to Blue C acts as an ‘attractor’ for small and medium sized, high-tech, life science companies, which choose to be based in the Swansea area to be close to the strong life sciences research base in the ILS. The existence of Blue C and associated expertise also encourages ‘spin-out’ activity from the Higher Education sector in Wales.

Nurturing young businesses

To help further stimulate business and economic activity, the ILS has developed its own “Micro-Technium” linked to a Technium network present throughout Wales. These incubators give fledgling businesses immediate access to expert commercial and academic advice, helping ideas to flourish and grow. The new opportunities opening up around the ILS are also bringing exciting business opportunities to the area in other ways. Alliance Boots, Europe's leading pharmacy-led health and beauty group, has located its Centre for Innovation in the business development space at the ILS building.

“We are exploring with IBM ways of unlocking unexpected insights from unstructured data. Many major breakthroughs have been made as the result of anecdotal evidence. If we can ease and enhance the use of this type of information the potential is really exciting. The work we are doing will help IBM develop standard toolsets for clinicians worldwide.”

– David Lewis, Director, Blue C at the Institute of Life Science, Swansea University

The Centre helps researchers and entrepreneurs from around the world develop new healthcare and medical ideas. Liz Morgan, Director of the Boots Centre for Innovation explains: “The powerful combination of research and technical expertise provided by both Swansea University and IBM was a major factor in our decision to locate our Centre for Innovation in the Institute of Life Science at Swansea. It is likely that some of the health and well-being ideas generated here will become widely recognised household brands of the future in areas as diverse as pain relief, cosmo-ceuticals, diabetes treatment and healthy ageing.”

Unlocking the full potential of health information

From the start, experts from IBM have worked closely with scientists at the ILS to help them get the best out of Blue C. The University collaborates with IBM's Thomas J Watson Research Center on a number of projects, such as the Health Information Research Unit (HIRU) project – taking patient data from the whole of Wales, anonymizing it into a data warehouse and using novel data and text mining methods to provide a countrywide picture of health. Research projects using this data include those assessing the effectiveness of various health programmes.

Swansea University is also interested in making the most of unstructured data such as patient correspondence and clinicians' notes. The University is collaborating with the IBM Research Center to explore how this currently untapped information can be used to improve medical insight. This groundbreaking project is using pattern recognition and machine-learning algorithms along with large scale data mining to produce a more complete picture of health than has ever been possible before.

“We are exploring with IBM ways of unlocking unexpected insights from unstructured data,” says Lewis. “Many major breakthroughs have been made as the result of anecdotal evidence. If we can ease and enhance the use of this type of information the potential is really exciting. The work we are doing will help IBM develop standard toolsets for clinicians worldwide.”

Key components

Software

- IBM High-Performance Computing software suite
- IBM HPC cluster management tools
- IBM DB2 Universal Database
- IBM Tivoli Storage Manager
- IBM WebSphere Application Server

Hardware

- IBM eServer Cluster 1600
- IBM System Storage
- IBM Tape Library

Services

- IBM Global Technology Services
 - Integrated Technology Services
 - Systems Management Consulting
 - Detail Design/Development
 - Hardware Installation Services
 - Hardware Maintenance
 - Software Maintenance

Transformation at a glance

The ILS stimulates collaboration between specialists in medicine, engineering, computing, physics and bioscience, supported by a specialist business team focussed on building links with the commercial world. The benefits of healthcare and medical breakthroughs are rapidly driven out to the region and to the public at large, giving a regenerative buzz to South West Wales. Alliance Boots, Europe's leading pharmacy-led health and beauty group, has recently located its Centre for Innovation in the business development space of the ILS building bringing exciting business opportunities for entrepreneurs worldwide.

Committed to sustainable development

Swansea University has a commitment to sustainable development on campus, so the new ILS building incorporates a number of eco-design features. One of the most exciting takes advantage of the natural, stable warmth of the earth to heat or cool the building via geothermal pilings. Energy costs are far lower than for conventional buildings.

The IBM technology used by the ILS is also becoming more energy efficient in relation to the amount of computing power provided. A recent technology refresh enabled Blue C to take advantage of the latest available processor technology, reducing energy costs by around £50,000 annually.

Through the Technium centres, the ILS works with businesses on a variety of energy related projects focusing on marine energy, micro-generation technologies, bio-refining and the cleaner use of carbon-based fuels. As a result, a company involved in generating wave energy has chosen to build and test its first full size prototype in West Wales and is working with the ILS on the technical issues associated with transferring electricity into the National Grid.

Initial and growing success

Andrew Davies, Minister for Finance and Public Service Delivery at the Welsh Assembly Government sums up the benefits that the ILS has already brought: "The ILS represents a quantum leap in the development of Wales' knowledge economy and is a key part of the strategy intended to make Swansea, and Wales, the home of a vibrant and dynamic life science cluster."

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ibm.com/innovation



IBM United Kingdom Limited

PO Box 41
North Harbour
Portsmouth
Hampshire
PO6 3AU

Tel: 0870 010 2503

ibm.com/services/uk

IBM Ireland Limited

Oldbrook House
24-32 Pembroke Road
Dublin 4

Tel: 1890 200 392

ibm.com/services/ie

IBM South Africa Limited

Private Bag X9907
Sandhurst
2146
South Africa

Tel: 0860 700 777

ibm.com/servicessolutions/za

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