

# HPC AND BIG DATA IN LIFE SCIENCES

The objective of the project was to accelerate the adoption of High Performance Computing (HPC) and Big Data within the Scottish life sciences sector by running a series of industry focused events, primarily targeted at raising awareness of the benefits of HPC and Big Data within the sector.

## THE POTENTIAL TO CHANGE LIFE SCIENCES

HPC and Big Data have the potential to drastically accelerate discovery life cycles across life sciences in use case scenarios such as:

- Chemistry: including bio-chemistry, molecular modelling, and protein folding
- Bio-engineering: including agricultural engineering
- Genomics and proteomics: Including next generation sequencing
- Biology: including molecular biology
- Pharmacology: including pharmacokinetic/ pharmacodynamic (PK/PD) modelling
- Analytics: including statistical analysis and bioinformatics
- Energy: Including biofuels.

This can significantly strengthen a company's competitive standing. In life sciences the benefit of accelerated discovery lifecycles extrapolated across the entire Scottish life sciences sector could be a potential catalyst for growth, drastically improving the standing of the Scottish sector in global markets. This could have a considerable impact in protecting and growing jobs in both technology provision and technology service consumption.

The Scottish LifeSciences and Healthcare sector consists of a large number of companies. Many of these companies are small to medium sized enterprises (SME). These companies face particular problems with technology adoption. HPC and Big data technologies can be expensive to acquire and maintain, companies commonly lack the knowhow needed to exploit the technologies, and generally they lack access to other resources such as financial capital.

In order to accelerate adoption of such technologies within the life sciences sector a level of initial awareness has to be created, and this was the aim of the events proposed within this project. The events were of significant value in uncovering the detailed nature of the needs and wants of Scottish life science companies. This information will be invaluable in shaping a number of follow-on services in HPC and Big Data including training, consultancy and software development for delivery by EPCC and its partners.

The awareness building objectives of this project are two fold. Firstly to build a level of awareness of the technical benefits, and secondly to increase awareness of the facilitating vehicles that can be accessed to reduce barriers to adoption, signpost easy access to facilities and resources, and therefore accelerating opportunity realisation.

# THE POTENTIAL TO CHANGE LIFE SCIENCES

The events were delivered by EPCC, a recognised leader in the delivery of HPC and Big Data services, in collaboration with three sector focused centres, Bio City, Edinburgh BioQuarter and BioDundee. With broad geographic community reach, these centres have a unified focus to accelerate developments across the Scottish life sciences and healthcare sectors. By encouraging collaborations between industry, academia and the public sector these centres have each built exceptionally strong community networks; valuable targets for disseminating the benefits of HPC and Big Data technologies.

Prior to the events a broad marketing campaign was undertaken by EPCC and delivery partners reaching out to around 300 organisations in total. This pre-event campaign has generated significant awareness building impact in signposting availability of resources at EPCC and its partners.

Together with a strong consortium of industrial actors we constructed a strong set of talks for our target audience. The events took place during the last week of August and the first week of September 2015. The seminars were exceptionally well attended with around 80 delegates in total attending the events. Strong delegate feedback was received with 100% of delegates rating the events as useful or very useful to their business needs.

## Talks included:

- Demystifying Big Data: EPCC
- HPC, Big Data, and BioInformatics: EPCC
- The Scottish Big Data Ecosystem: EPCC
- How Genomic Big Data is shaping animal breeding for the 21st century: Aviagen
- Genomic Research at Scale: Aridhia Informatics
- Use of Real World Data to Support Drug Development: GSK
- Big Data challenges and solutions in Healthcare and Life Sciences: IBM
- Scottish Innovation Centre Value: The Data Lab.

The speakers, from left to right are: Dr. Damian Mole (Edinburgh University), Dr. Usha Gungabissoon (GSK), George Graham (EPCC), Gilian Docherty (Data Lab), David Crems (IBM), and Diane Harbison (BioCity).



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## SUPPORT FOR SMALL AND MEDIUM ENTERPRISES

The technical talks were complemented with talks signposting how Scottish life science companies could accelerate adoption of HPC and Big Data technologies. In fact, with many of the companies attending the seminars being SMEs aspects of the seminars that described the Scottish HPC and Big Data ecosystem were of particular value. The events were particularly relevant in explaining how barriers to adoption could be lowered for SMEs by interfacing with organisations such as Scottish Enterprise (SE), the Scottish Innovation Centres (such as the Data Lab, The Digital Health Institute and Stratified Medicine Scotland), Farr Institute Scotland, as well as some of the newly created academic collaborations such as the Alan Turing Institute at the University of Edinburgh.

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## THE FUTURE

EPCC is currently planning post event activities, particularly in marketing and PR, to reinforce and broaden the impact of the messages delivered during the seminars. The EPCC website, blogs, news and social media channels will be used to reemphasise the benefits of HPC and Big Data technologies to the Scottish Life Sciences community. Focused case studies will be made available such that these organisations can learn from past experience. Ongoing collaboration with BioDundee, BioCity and BioQuarter will be used to reinforce the benefit messages. As a particular example, BioCity have invited us to engage in a similar fashion with a soon to be created sister organisation, MedCity, in the short to medium term.

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