Pragmatic insights from the coalface

People, trust, flexibility, interaction are all the usual suggestions that you'd expect to make collaborative research more effective. The Engineering Department's conference "Research through Industrial Collaboration: Engagement in practice – lessons from the coalface" on 1st May 2014 featured speakers from both sides of a collaboration partnership and the comparison of perspectives was fascinating. But what were the surprises?

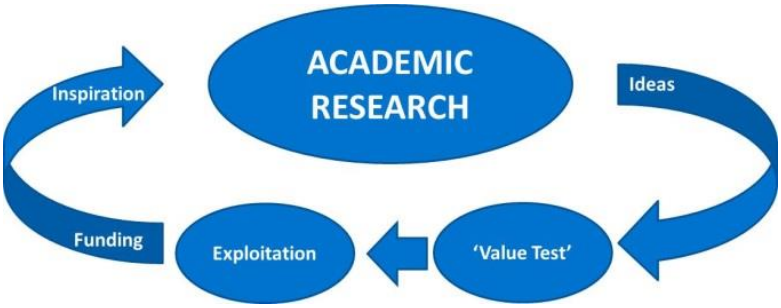
Companies with both long and short product cycles value Cambridge's focus on the fundamental, but for different reasons. Boeing, with long product lives and a need for corporate caution in using new technology, behaves in the same way as Dyson, a company with very short development times and a focus on immediate action. How and why? Both turn to the University for the 'hard problems', for the fundamental insights that transcend the business cycle. Gary Fitzmire described how Boeing de-risks technology and seeks solutions for the next generation through research.

Using the University for the fundamental insights doesn't slow Dyson's agile product development but, as Frederic Nicholas described, instead enables his team to better direct the fast prototyping and experimental cycles that enable radical innovation and speed to market. From the Cambridge perspective, rapid changes in priority could threaten long-term research, but Dr Anurag Agarwal described how a focus on fundamentals and understanding the core phenomena enables his research team to deliver value into several product families as they evolve.

Dr Philip Woodall described how he and his colleagues have learned to go way beyond the 'research outputs' to concentrate on the 'business outcomes' by focusing on value within the world into which their research will fit. Choosing the most valuable target problems and early planning to get researchers on-site to embed the work underpin success. But both Boeing and Dyson are finding that they have to spend more of their own time to understand and exploit the new opportunities – because the new insights are powerful and have far-reaching implications.

And in a world moving ever faster it's best to experiment and 'fail fast' – right? Well, maybe. How do you ensure the patience to push hard at the difficult problems and not abandon research at the first failure? How hard to push for the big breakthrough?

This is where continuity, flexibility and trust come in. Dr Andrew Flewitt uses collaboration with industrial partners as a "value test" to direct his work and as a stimulus for new questions. So by building the core research capability and facilities over many years through EPSRC funding, Andrew has then been able to work on short-term projects with SMEs that build into long-term relationships.



One such collaboration evolved as PragmatIC Printing embedded a researcher alongside the Cambridge team to assess and develop the production technology now at the core of the company. Then, as Richard Price explained, they were able to move to the High Value Manufacturing Catapult for the scale-up work that doesn't fit so well at Cambridge, while Andrew takes the insights from the collaboration to new research directions.

But how flexible can a consortium be and how do they enable continuity? Professor David Cebon has built the Cambridge Vehicle Dynamics Consortium over two decades as a non-competing 'supply chain' consortium, now extending it in collaboration with Herriot Watt university to create the Centre for Sustainable Road Freight, this time with (competing) companies from the road freight industry. Ensuring the consortium members actively engage in project selection and execution enables a portfolio of projects, both long- and short-term, providing answers to both enduring and immediate questions.

And where the enduring questions are of interest across an industry then the consortium approach enables even direct competitors to leverage research funding and address shared problems such as reducing carbon emissions from freight transport, augmented by focused projects on specific implementation, as described by Justin Laney of the John Lewis Partnership.

Philip Guildford, Director of Research at the Engineering Department summarised the morning's presentations in terms of focus on people's core interests, try something soon and then iterate as necessary, stay close and keep looking for new connections and new capabilities. And in a foretaste of messages to come – seek to become the natural attractor for new ideas and opportunities.

The pragmatic lies in the context of the strategic as global companies form global partnerships with collaborating universities. And as Tomas Coates Ulrichsen reported from the Centre for Science Technology and Innovation Policy's March conference on strategic partnerships, that research intensive multinational companies will increasingly choose their university partners on the basis of their ability to build international academic alliances to attract the best teams to bring the best research to bear on difficult industrial issues.

So the underlying messages were all flavours of the themes suggested by Professor Richard Penty at the conference dinner. Success depends upon flexibility and a focus on outcomes not milestones. Building long-term relationships between competent people enables the short-term projects to co-exist with researching the fundamentals that enable the big breakthroughs. And it all requires time and commitment to build the frequent interactions that enable mutual trust and understanding between the best possible teams.