The research commercialisation office of the University of Oxford, previously called **Isis Innovation**, has been renamed **Oxford University Innovation**

All documents and other materials will be updated accordingly. In the meantime the remaining content of this Isis Innovation document is still valid.

URLs beginning www.isis-innovation.com/... are automatically redirected to our new domain, www.innovation.ox.ac.uk/...

Phone numbers and email addresses for individual members of staff are unchanged

Email : enquiries@innovation.ox.ac.uk

University Technology Transfer - Models, Components and Frameworks

Tom Hockaday, October 2014

The gap between what the people involved in doing technology transfer in universities actually do and the outputs of the academic researchers who study it appears to be closing. This is very welcome. Over the years I have read a number of academic articles based on research into technology transfer whose analytical data-based conclusions are for the most part entirely unrecognisable to the practice of university technology transfer. For those looking for it, sympathy for the researchers may lie in the limited supply of data for detailed analysis. It is hard to make too many conclusions from publication and patent data alone.

I have recently come across four articles and publications on technology transfer which present models, components, frameworks and discussion in a practical and helpful way. The purpose of this article is to describe them in brief, drawing out the key practical points that struck me as insightful and helpful.

"Creating university-based entrepreneurial ecosystems, evidence from emerging leaders"

- *Ruth Graham for MIT Skoltech Initiative; June 2014*

This report describes a benchmarking study of the experiences of an 'emerging leaders group' of universities to gain insight into the conditions and strategies associated with successful entrepreneurship and innovation ('E&I') systems around universities.

There are two particularly useful features in the report:

The first is the identification of three components critical to the establishment of an entrepreneurial university:

Component 1	Component 2	Component 3
Inclusive grass roots community of E&I engagement across the university and regional communities	Strength in industry-funded research and licensing of university-owned technology	The University E&I agenda reflected in its policies, mission, budget allocations, incentives and curriculum

Dr Graham identifies two challenges for universities in long term success for E&I growth: the disconnect between components 1 and 2; and the difficulty of embedding E&I in the vision and mission of a university. It is rare for E&I to be embedded and aligned with the teaching and research findings.

The second is the identification of two models of how successful universities have established global recognition in entrepreneurship and innovation:

> **Model A**: 'bottom-up' and community led, catalysed by students, alumni and entrepreneurs in the regional economy, with 'loose IP control'

Model B: 'top-down' and university led, working through established university structures, with a 'tight IP control'.

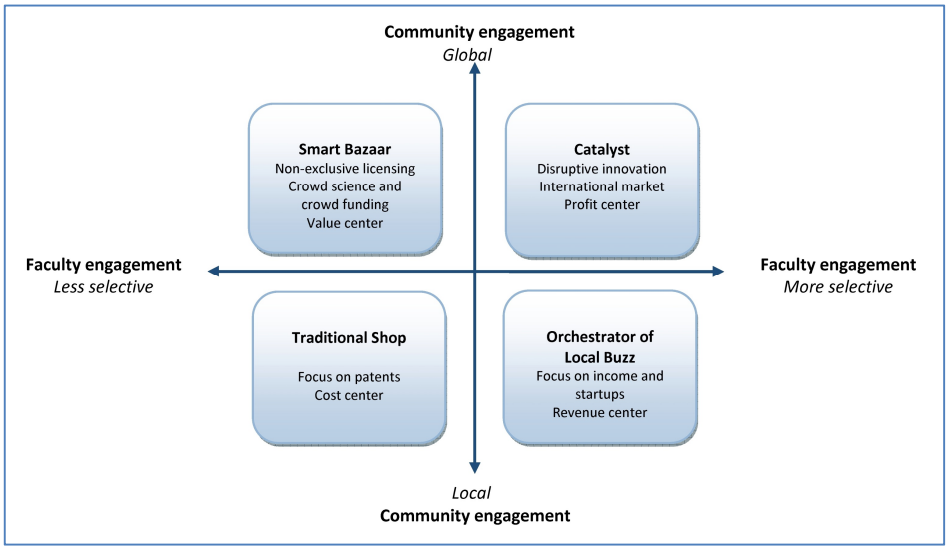
The relationship at any one time in a university between the three components and the relative influence of the two models goes a long way to explaining the successes and challenges a particular university faces. How well developed are each of the components in your university? Do you recognise one as dominant, and others as lacking?

The really exciting thing of course would be for a university to do both, in balance, in a coherent and connected way.

"Technology Transfer Office Business Models: One Size does NOT Fit All"

- *Daniela Baglieri, Francesco Baldi & Christopher Tucci; October 2014*

This academic paper describes four models of how technology transfer activities are configured in universities. The models are placed within a framework based on two ranges: the level of community engagement from Global to Local and the level of faculty engagement from Less selective (ie more academics are engaged and involved working with the technology transfer office) to More selective. These two ranges, which become axes, are both worth considering for your university now and where you think it could and should be heading.



'Traditional Shop'

Technology transfer is a process to transfer existing research outputs into the marketplace through formal linkages. This is the bottom left quadrant: less selective faculty engagement with local community engagement.

'Orchestrator of Local Buzz'

The focus here is exploiting new scientific and technological opportunities to boost local economic development. This is the bottom right quadrant: more selective faculty engagement with local community engagement.

'Catalyst'

With global community engagement and more selective faculty engagement, this model is of universities which transfer disruptive innovations to the global marketplace through exclusive licensing and make money doing it.

‘Smart Bazaar’

With global community engagement but less selective faculty engagement, this model follows non-exclusive licensing, crowd activities seeking to optimise societal benefit.

The attraction of these models is not whether or not you agree with them or which you happen to think is ‘best and worst’. The attraction lies in the two axes and the description of the different approaches, which the authors have drawn from AUTM data and detailed interviews.

In your university are you appealing to a few or many of the academics? How are you balancing getting technologies out to large global corporations with stimulating local activities?

“The roadblock to commercialisation”

- *Thomas Allen & Rory O’Shea – An FT ‘Soapbox’ Article 28th September 2014*

‘Our research has identified four successful models currently operating in several universities around the world’. The four models the authors describe as being successful are

‘Gateway Approach’

This aims to minimise all barriers to commercialisation, through merging offices of research, contract, technology transfer and industry engagement, as well as entrepreneurship supports, into one unit with the aim of streamlining enterprise engagement. In this model, the technology transfer office encourages deal flow rather than short-term revenue maximisation objectives. The real money will be generated down the road when successful entrepreneurs seek further research and development partnerships or make donations to the university. (Reference: Trinity College Dublin, Ireland)

‘Investor Centric Approach’

Universities develop long-term partnerships with IP commercialisation specialists to bring ideas successfully to market. In Europe, an organisation known as the IP Group now partners with 12 leading universities, including King’s College London. It has launched more than 100 spinout companies of which 15 have progressed to IPO. (Reference: IP Group, UK)

‘Academic entrepreneurship model’

The technology transfer office takes an active role in connecting academic entrepreneurs with venture capitalists and then lets them proceed. The technology transfer office does not attempt to interfere in the management of the venture, whilst holding a small equity stake. The focus is on getting knowledge and technology into society and creating an economic impact in the community. (Reference: MIT, USA)

‘Easy Access IP model’

Based on volume, this model essentially gives away the IP for free. While it does not generate revenue for the university, it may achieve the goal of getting inventions into society that otherwise may never see the light of day. (Reference: Glasgow, Bristol, KCL, UK)

I have not read the research behind the article, and have not seen the evidence behind the successful nature of all the models they describe.
The authors’ book was published in September 2014 ‘Building Technology Transfer within Research Universities – An Entrepreneurial Approach’. ISBN: 9780521876537.

"Measuring University-Business Links in the United States"

- *Tomas Ulrichsen, Alan Hughes & Barry Moore; October 2014*

Anything Alan Hughes writes is worth reading. A front page quote from Albert Einstein sets the quality they are aiming for ("Not everything that counts can be counted, and not everything that can be counted counts"). The context for the report is measuring university business in the UK, and what the UK may learn from the US.

This Report presents a Framework for positioning Knowledge Exchange activities within the wider set of knowledge diffusion mechanisms from universities to potential users. The Framework focusses on how to manage the boundaries between universities and innovative firms so as not to damage either side. The Framework points to the complexity of the interactions and the challenges of seeking metrics based systems for measuring them in whole or individually. It is clear that narrative case studies play a key role in presenting the benefits from university – business interactions.

The framework presents the large number of interactions between the underlying activities of universities, described as Educating people and Research (pure-basic, user-inspired, and applied) and potential users in the economy and society. Whilst recognising the important of academic publications and graduating students, the focus of the framework is on the other interactions and 'diffusion mechanisms' collectively Knowledge Exchange:

> *Industrial conferences; university-industry centre; collaborative/contract R&D; consultancy; technology transfer – licensing/spin-outs; prototyping and testing; people exchange; networks and forums; informal advice; workforce education/courses.*

The value here lies in the over-arching framework and the recognition of the complexity of the environment. How does your university approach each of these interactions? What resources are in place to support them? How well connected and managed are they?

The Report goes on to discuss metrics for capturing the effects of university knowledge exchange activities within the framework.

Observations

These four publications provide a wealth of components, models, frameworks, and observations and comments. A few comments:

- It is a significant challenge for the people who run universities to understand how knowledge exchange and technology transfer work because with only rare exceptions they are only familiar with one part (side?) of the incredibly complex environment. Running a university is one thing; running a business is another; running an organisation that has to bridge the gap is a third.
- I think greatest success will come from combining Models A and B in Ruth Graham's report. In current organisational terms this means combining technology transfer activities with student entrepreneurship activities; each has so much to offer and learn from the other.
- In the UK, the publication of the Research Excellence Framework Impact Case Studies in December 2014 will provide a fabulous data set from which to observe and study how UK universities have chosen to present their impact on the world. How the judges (panels of academics) have scored the various case studies will set the tone for how universities seek to demonstrate impact in the next five years.

- It is very encouraging to see academic researchers in universities studying and writing about university technology transfer, knowledge exchange, innovation and entrepreneurship in ways which can help the practitioners. Thank you.

"Creating university-based entrepreneurial ecosystems, evidence from emerging leaders"

http://www.rhgraham.org/RHG/Recent_publications_files/MIT%3ASkoltech%20entrepreneurial%20ecosystems%20report%202014%20.pdf

"Technology Transfer Office Business Models: One Size does NOT Fit All"

http://www.unime.it/ateneo/organizzazione/_dipartimenti?empid=52f50f65f914d98bb5e3b94e95c89dc93a06b350

"The roadblock to commercialisation"

http://www.ft.com/cms/s/2/a1ea7c72-18cc-11e4-933e-00144feabdc0.html#axzz3JQmBIA7g

"Measuring University-Business Links in the United States"

http://www.hefce.ac.uk/pubs/rereports/year/2014/businesslinksus/