

Universities in the Innovation Ecosystem

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The Evolution of University–Business Interactions

- The ‘laissez faire’ model
 - Importance of chance, luck and serendipity
- The standard model
 - Focus on a narrow range of technology **transfer** mechanisms
- The wider model
 - Focus on a wide range of interactions
 - **Exchange** rather than transfer

The Laissez Faire Model

- Universities focussed on two missions – research and education
- Example: the ‘Cambridge Phenomenon’ developed when the University took little active interest in business engagement. In the past:
 - University largely ignored IP issue
 - Adopted a liberal attitude to what academics did
 - Industrial liaison merely acted as ‘window’ on what the university did – little exchange or dialogue

The Standard Narrow Model

- Narrow focus on Technology Transfer
- Mechanisms: Patents, Licenses, Spin-outs
- Limitations
 - Model is incomplete
 - Potential financial returns were frequently over-estimated
 - Metrics distorting behaviour (Goodhart's Law: any observed statistical regularity will tend to collapse once pressure is placed upon it for control purposes)

The Wider Model: Multiple Knowledge Exchange Mechanisms

- Educating people
- Increasing the stock of 'codified' useful knowledge
- Problem solving
- Public space functions (Universities do not move)
 - Relatively neglected, but distinctive
 - Includes networking; social interaction; meetings, conferences; entrepreneurship centres; personnel exchanges, including internships
- Focus on exchange and interactions

Knowledge Exchange – Multiple Mechanisms

Educating People

- Training skilled undergraduates, graduates & postdocs

Increasing the stock of 'codified' useful knowledge

- Publications
- Patents
- Prototypes

Providing public space

- Forming/accessing networks and stimulating social interaction
- Influencing the direction of search processes among users and suppliers of technology and fundamental researchers
 - Meetings and conferences
 - Hosting standard-setting forums
 - Entrepreneurship centers
 - Alumni networks
 - Personnel exchanges (internships, faculty exchanges, etc.)
 - Visiting committees
 - Curriculum development committees

Problem-solving

- Contract research
- Cooperative research with industry
- Technology licensing
- Faculty consulting
- Providing access to specialized instrumentation and equipment
- Incubation services

Source: A. Cosh, A. Hughes and R. Lester *UK PLC Just How Innovative Are We?* Cambridge MIT Institute 2005

University- Business Interactions: US UK Innovation Benchmarking Survey

- Joint IPC MIT and CBR Cambridge Innovation Benchmarking Survey (Source: Cosh, Hughes and Lester, 2005)
 - Unique survey comparing UK and US 2005
 - Manufacturing and Business Services
 - Overall Sample: 2129(UK) 1540 (1540)

University-Business Interactions: Results from US UK Innovation Benchmarking Survey

- To increase innovation, businesses engaged with universities using a wide range of interactions
- Informal contacts are most frequent
- Conventional modes of university output (graduates, publications, conferences) amongst most frequently cited
- Licensing and patenting amongst least frequently cited

University Business Interactions and Innovative Activity: Degree of Importance

- How important are interactions?
- US companies rate all interactions as highly important more frequently than UK companies
- US companies place a relatively high importance on
 - Licensing, joint R&D and problem solving
 - BUT this is a low frequency activity
 - Post doc and graduate recruitment and internships
 - AND this is a high frequency activity

Universities in the Innovation 'Ecosystem'

- In both countries universities are ranked low in frequency of use
- Customers, suppliers, competitors and internal knowledge are the dominant sources
- In general UK companies are *more frequent* users of external sources than US
- But US companies were more likely to rate the knowledge sources as *highly important* than the UK
 - Especially public sector, university and private research institute sources

The Importance of Diversity

We should, however, guard against a situation where all our universities aim for the same goals. What is required is a diversity of excellence, with research universities focusing on curiosity driven research, teaching and knowledge transfer, and business-facing universities focusing on the equally important economic mission of professional teaching, user-driven research, and problem solving with local and regional companies.

Sainsbury (2007): The Race to the Top: A Review of Government's Science and Innovation Policies, p.44

Universities and Innovation: the Importance of Diversity and Local Economic Structure

A. Knowledge Generating Locations

- Indigenous creation of new technologies

B. Knowledge Using Locations

- Transplantation of new economic activity into region
- Diversification of existing industry into new activities
- Upgrading of mature industries

Adapted from Richard Lester Universities, Innovation, and the Competitiveness of Local Economies: A Summary Report from the Local Innovation Systems Project – Phase I, MIT IPC Working Paper IPC-05-010, December 2005

The Importance of Diversity Developing New Technologies - the Tale of Two Cities

- Strong biotechnology clusters in the Cambridges (USA and UK)
- But the development of the industry in the two cities reflects different trajectories and different challenges
- Indicates the importance of understanding the geography and history of place

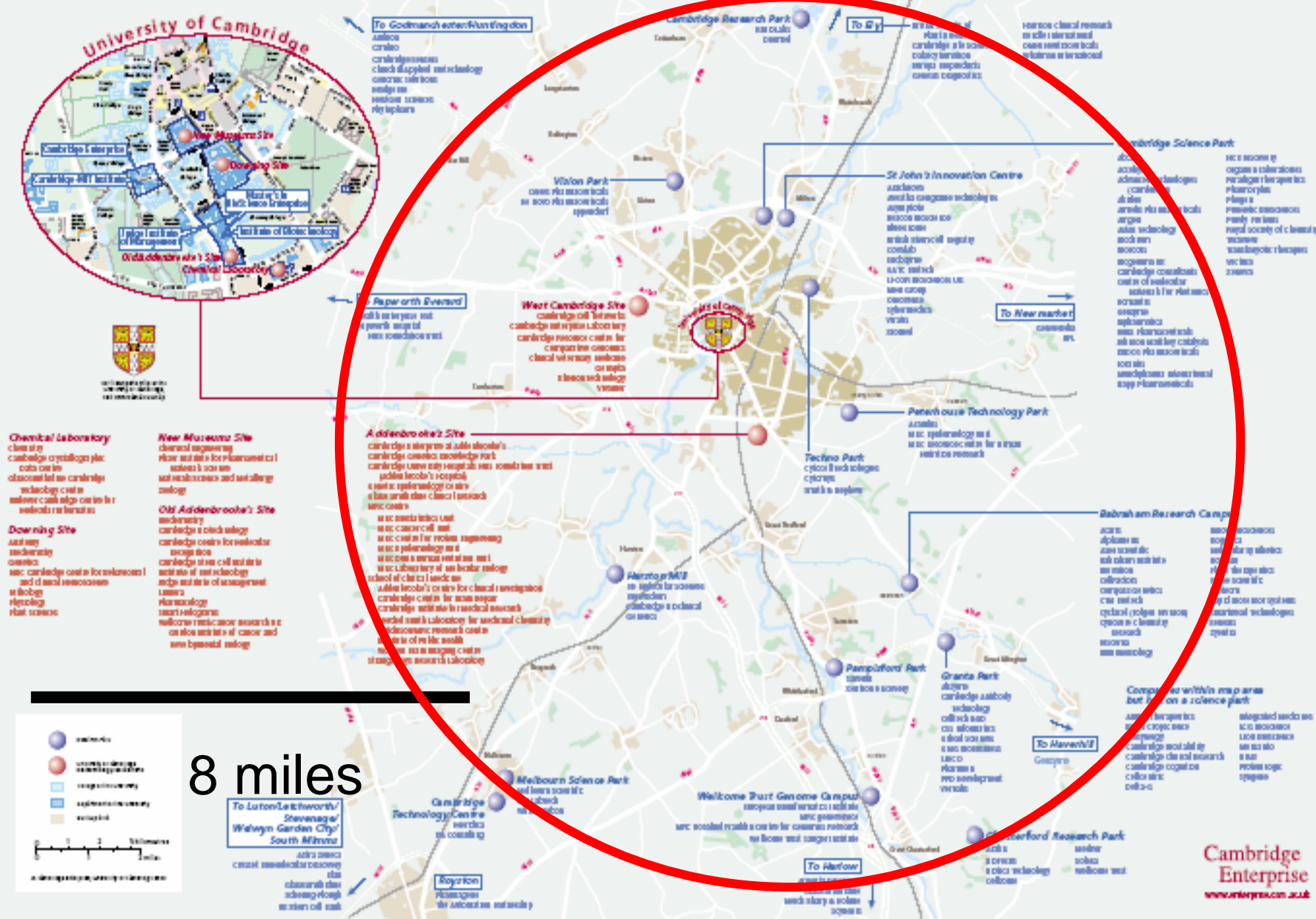
Biotech Cluster in Greater Kendall Square



1 mile

Source: MIT
Entrepreneurship
Centre

Cambridge Biotechnology Cluster 2004

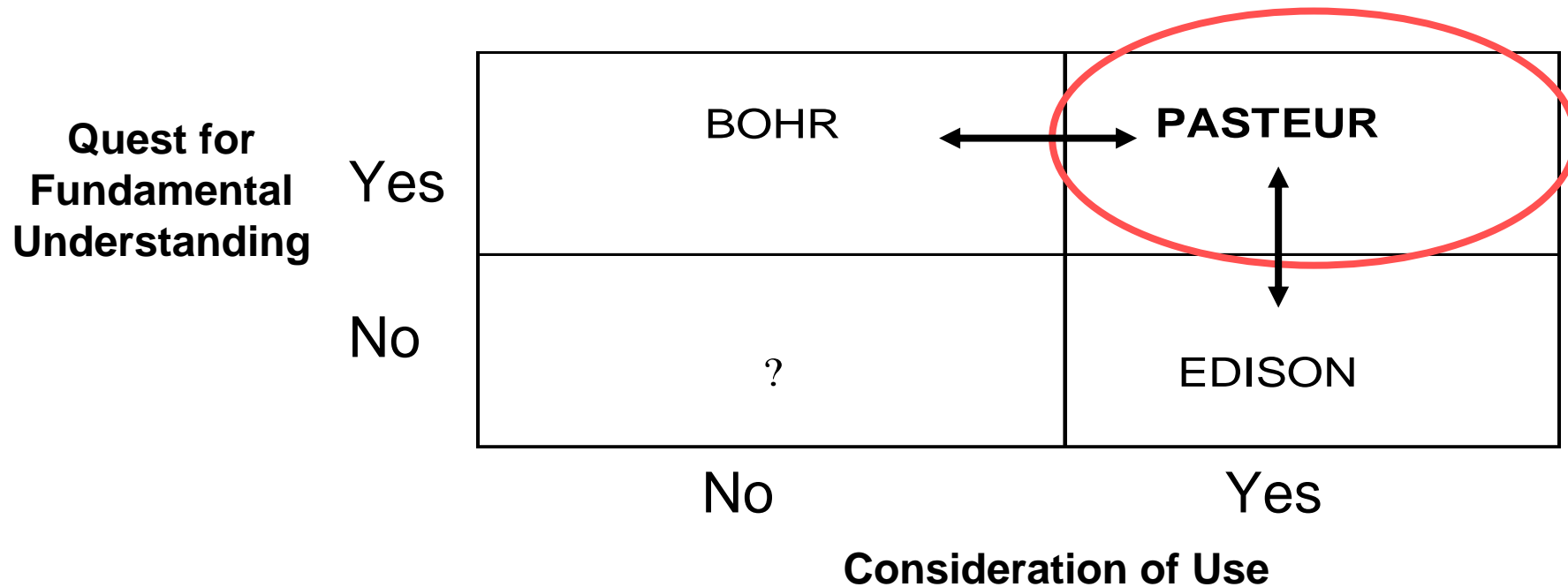


8 miles

University-Business Interactions: Constraints and Hurdles

- Misaligned Incentives
- Time frames
- Institutional Differences
 - Vertically organised businesses
 - Horizontal flat Universities
- Cultural differences
- ‘Language’ differences
- Lack of skills and competences at the collaboration interface (the ‘boundary spanning’ function)
- Funding (especially where the social rate of return is high but the private rate of return is low or widely spread)

Aligning Incentives – Knowledge Exchange in which space?



University-Industry Knowledge Exchange in the UK Regions: The State of Play

- There is no one ideal model of university-business interactions
- Each individual case requires
 - a strategic view by universities of their capabilities
 - a strategic view by region of sectoral requirements
 - a careful matching of university capabilities and regional development path needs
- The need for more evidence on the role and impact of university-business interactions in the innovation ecosystem.

Further and Future Information

- **Centre for Business Research**
 - www.cbr.cam.ac.uk
- **Programme on Regional Innovation**
 - www.regionalinnovation.org.uk

References

Cosh, A., Hughes, A. and R. Lester, R. (2005), *UK PLC: Just How Innovative Are We?* Cambridge MIT Institute

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Stokes, D. (1997), *Pasteur's Quadrant*, Washington Brookings Institution.

Maps: MIT Entrepreneurship Centre and Cambridge Enterprise.