

# 7 University Business Partnerships and Models of Technology Transfer Offices

*“The modern university looks forward, and is a factory of new knowledge.”*

THOMAS HUXLEY (1825–1895)

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## 7.1 Introduction

In order to compare business partnerships for different universities and their models of technology transfer offices (TTOs) a sample of six UK universities were considered which include the universities of Oxford, Imperial College, Warwick, Portsmouth, Hertfordshire and University College London, which were highlighted by Tang (2008). According to Tang (2008) five key findings with regard to business projects and processes are: the speed of response from academics in contract agreement is important when dealing with business; it is essential to have an effective incentive structure to encourage academics to engage with business; of particular importance are R&D research partnerships which help generate academic intellectual property and are a route to commercialisation; universities need to engage in active measures in order to increase the knowledge about the commercialisation process and the benefits that arise from it for students, researchers, lecturers and faculty heads; for university business partnerships to be successful there is a need for expertise and commitment by university senior administrators to support and build partnerships who need to understand academia and industry technology/knowledge transfer dynamics; and in order for good practice there is a need for internal university cultural change especially at senior management level.

The importance of university business partnerships, in a policy context, can be traced to the 1993 Government White Paper “Realising Our Potential” (OST, 1993) which recognised the need for universities to identify ‘potential users’ of the results of their research in industry and other areas, and with these to ensure successful exploitation. Furthermore, the Lambert Report (Lambert, 2003) also identified the importance of universities working with industry to optimise the exploitation of outputs.

According to Tang (2008) there is a wide range of practices undertaken by university technology transfer offices (TTOs) to enhance university business partnerships ranging from a relaxed approach to structured proactive business facing strategies. These practices include market and sector research, regulatory developments to increase demand for products, creating new businesses and supporting businesses, exploring new opportunities and R&D partnerships, collaborative agreements and projects.

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## 7.2 The Management of University Business Partnerships

A recent review of business university collaboration (Wilson Report, 2012) has reported considerable progress in the cooperation of universities and businesses over the last decade. This has been evidenced through three main methods to stimulate university and business collaboration involving change through good management to improve an institution's performance to achieve objectives, indirect and direct funding incentives, and regulatory requirements (Wilson Report, 2012). An example of this was the Confederation of British Industry taskforce report (CBI, 2009) which set an agenda to improve the collaboration of universities and businesses. Moreover, businesses appear to value partnership collaboration with universities to a greater extent than linear intellectual property (IP) innovation process transactions (Perkmann and Walsh, 2007). Contrary to many universities' approach to knowledge exchange much contact between external organisations and academics involves direct contact between the academic and the business rather than the university technology transfer or knowledge exchange office (PACEC/CBR, 2011). Here networks between industry and academics are important and a recent study has indicated that some 40% of academics interact with businesses in this way (Abreu et al, 2009). Although these types of collaborations and partnerships in the past have been through personal relationships and ad hoc types of cooperation (Melese et al, 2009), individuals have had to be involved in the early stage development of technologies by businesses and universities (Termouth and Garner, 2009). Further to the activities of individuals secondments, internships and placements are also considered to be good ways to enhance knowledge exchange (CBI, 2009), although secondments for post doctoral researchers has been low (CROS, 2011) and academics tend to be limited in their availability for placements (Wilson Report, 2012). With regard to global innovation environments a Higher Education Funding Council for England (HEFCE) study reported that higher education centres of excellence can offer access to expertise by providing networking opportunities and interactions with corporate partners being made aware of centre technical themes (Knee and Meyer, 2007). The establishment of a network of centres to commercialise research in the UK was advocated by the Dyson (2010) and Hauser (2010) reports which would aid the development of business sectors by facilities with public subsidies similar to the Fraunhofer German institutes although offering greater university business collaboration. This was realised through the announcement of funding for 6 technology and innovation centres (TiCs) in 2011 (TSB, 2011). The analysis of the latest literature illustrates that there has been much progress in the management of university business partnerships built upon the original developments evidenced in previous studies and this is further substantiated through the models of technology transfer offices.

### 7.3 Models of Technology Transfer Offices

University TTOs/business development units are central to the exploitation of university business partnerships and they undertake many activities to bridge the academic industry divide including the creation of networks of industrial links. Three models of TTOs have been identified from Tang (2008) that have different approaches to university business partnerships with industry and these are:

- Internal model – TTO integrated into the university administrative structure;
- External model – TTO operates outside the university either as a subsidiary or independent entity with autonomy over its operations;
- Hybrid model – A hybrid consisting of a combination of the above.

Through working with industry (Rogers et al, 2000) there is greater experience and professionalism of the TTO (Siegel et al, 2003). Developing the work of Tang (2008), the three different approaches are illustrated with reference to the sample of six UK University TTOs (Table 7.1) (Oxford, Imperial College, Warwick, Portsmouth, Hertfordshire and University College London).

Table 7.1 shows that there is a mixture of business partnership approaches among UK universities. The large research intensive universities, such as Oxford and UCL, have an externally organised approach or a hybrid approach as illustrated by Imperial College with Business Development Higher Education Funding Council for England (HEFCE) supported and Imperial Innovation traded publicly. Since the TTOs of Warwick, Hertfordshire and Portsmouth are integrated into the university administration they have an internally organised approach. They are mainly supported by the University and the Higher Education Innovation Fund but they are not all profit generating. Furthermore, the TTO at Portsmouth does not have a central objective to be a for-profit organisation and neither is the Business Development Unit of Imperial. All these universities have a mix of methods of exploitation practices (Tang, 2008) and all practice the three phases of (i) opportunity recognition, (ii) opportunity development, and (iii) opportunity exploitation (Van der Veen and Wakkee, 2006). A major part of the metrics of business related activities of universities involve spin outs, licences and patents and they are the key proxies for university commercialisation activities resulting in them being grouped together (spin outs are the best mechanism for “disruptive” technologies) (Tang, 2008). It appears that building good relationships between academics and industry underpins successful university industry partnerships.

University	Technology Transfer Office	TTO Model	Business Partnerships approach	Structure
Oxford	Oxford ISIS	External Model	Externally organised approach	Twenty seven project managers
Imperial College	Imperial College Business Development Unit	Hybrid Model	Hybrid approach	Three units: Imperial Consulting, Imperial Innovation, Business Development
Warwick	Warwick Ventures	Internal Model	Internally organised approach	Director, Five business managers, marketing manager and administrative assistant
Portsmouth	Portsmouth Research and Knowledge Transfer Services	Internal Model	Internally organised approach	Four managers of priority areas and a Business Development Manager
Hertfordshire	University of Hertfordshire Intellectual Property and Contracts Services	Internal Model	Internally organised approach	Head of IP and Contracts Support and academics
University College London	University College London Business Plc	External Model	Externally organised approach	Four divisions and about forty staff

**Table 7.1:** Different Approaches to University Business Partnerships for a sample of six UK universities  
Source: Developed from Tang (2008)

## 7.4 Networking Activities

Existing university business relationships can be strengthened through networks and they offer the possibility for new relationships to be developed with increased benefits from working with other industrial participants, which can lead to not only new collaborations and sources of expertise but also provide awareness of company competition (Tang, 2008). Networking activities can help SMEs who are excluded from networks involving research intensive corporations and universities (for example the universities of Portsmouth and Hertfordshire target SMEs in their networking activities). Networking through clubs/associations/societies can link researchers with industry, a notable example being the Oxford Innovation Society, and can result in the commissioning of studies by members (Molas-Gallart and Tang, 2007). Furthermore, the use of the alumni office for networking can be of particular benefit through contacting alumnae to obtain research sponsorship and the commercialisation of university IP (the University of Hertfordshire has attempted to harness alumni with the aim of exploitation).

Collaborative R&D projects are important university business partnerships and this form of “joint research” is a significant factor for connections with industry and knowledge transfer (Tang, 2008). This type of research enables the university researcher to keep up-to-date with industrial research, to obtain access to industrial research expertise and to increase the exploitability and applicability of university research (D’Easte-Cukierman and Patel, 2005). Collaborative projects and partnerships are a significant form of exploitation of academic research for the Research Division at Oxford University, for example, and together with agreements they are a major mode of exploitation for the University of Portsmouth (Tang, 2008). They are also the second most important mechanism for the University of Hertfordshire. With Knowledge Transfer Partnerships in an area outside the company’s business the industrial partner will allow the university to exploit the IP. Since the innovation process is moving towards an “open” model (Chesbrough, 2003a&b) protecting IP in collaborative projects is a vital consideration (Tang and Molas-Gallart, 2008).



Collaborative projects undertaken for the Engineering and Physical Sciences Research Council (EPSRC), Technology Strategy Board (TSB) and Faraday Partnerships with industry are another important form of university business projects. Faraday Partnerships are networks of organisations aimed at improving innovation competitiveness and performance of UK industry through research and development, knowledge transfer and exploitation of science and technology from the science base, and involve Research and Technology Organisations, businesses and universities (DTI, 2006a&b). The value of these partnerships has been recognised by the Economic and Social Research Council (ESRC), and through its Business Engagement Strategy, has encouraged academics involved in ESRC funded projects to work with industry.

## 7.5 Discussion

Good practices (Tang, 2008) for identifying university business partnerships include: establishment of a professional TTO with a staff mix involving academic and business experience; commitment to building and maintaining trust between academics and industrialists involving an understanding of the workings of academia and industry; maintaining continual contact on an informal basis with academics; adopting a transparent approach to explaining the process of commercialisation to academics; establishing an incentive structure for academics to engage with – consultancies as an entry point to understanding how companies operate to develop client lists and joint R&D projects/partnerships to exploit university IP; and avoiding over bureaucratisation of processes and procedures for engaging industry.

Good practices (Tang, 2008) for the successful exploitation of university business projects include: support from, and ability of, the TTO to undertake university business partnerships through three activities: (i) opportunity recognition; (ii) opportunity development and (iii) opportunity exploitation (Van der Veen and Wakkee, 2006); licensing is important; spin outs to provide a route to market and engage investors; Research and Development Partnerships to provide more academic IP and a route to commercialisation; consultancy to provide an initial route to exploitation; a “capabilities map” or “capabilities audit” to match industry needs coordinated with the Research Office and academics; implementation of active measures to raise awareness and knowledge about potential university business projects and the benefits with heads of faculties, lecturers, researchers and students; and submissions of bids to invitations to tender that require an industrial partner.

As well as the current proxies for successful university business projects and processes that focus on spin outs, licensing and patents other paths for successful university industry partnerships include support measures for entrepreneurial undergraduates and postgraduates, continuous professional development and training services, networking, collaborative research and consultancy partnerships and maintaining a strong relationship between industrialists and academics (Tang, 2008).

## 7.6 Conclusions

For university business partnerships to be successful there is a need for expertise and commitment by university senior managers to support and build partnerships who need to understand academia and industry technology/knowledge transfer dynamics (as noted by Tang (2008) in relation to findings from a study of university TTOs' exploitation of intellectual property in the UK). Research and Knowledge Transfer Services could make greater use of the services of the university business school (an example being Portsmouth University). The identification of university business partnerships could have greater assistance provided by the Research Office (as evidenced at the University of Hertfordshire). The three phases of (i) opportunity recognition, (ii) opportunity development, and (iii) opportunity exploitation need to be practiced similar to the universities of Oxford, Imperial College, Warwick, Portsmouth, Hertfordshire and University College London (Tang, 2008). The key proxies for university commercialisation activities of spin outs, licences and patents need to be recognised as a major part of business related activities of a university. Good relationships need to be built between a university and industry to underpin successful university industry partnerships. Existing university business relationships can be strengthened through networks and they offer the possibility for new relationships to be developed with consequent increased benefits. Greater networking, through clubs/associations/societies, needs to be undertaken by university researchers with industry to enable the commissioning of research projects. The development of an alumni office to enable networking is of particular benefit involving contacting alumnae to obtain research sponsorship and commercialisation of a university's IP (the University of Hertfordshire for example has harnessed alumni with the aim of exploitation). Protecting IP in collaborative projects is a vital consideration (Tang and Molas-Gallart, 2008) for a university since the innovation process is moving towards an "open" model (Chesbrough, 2003a&b).

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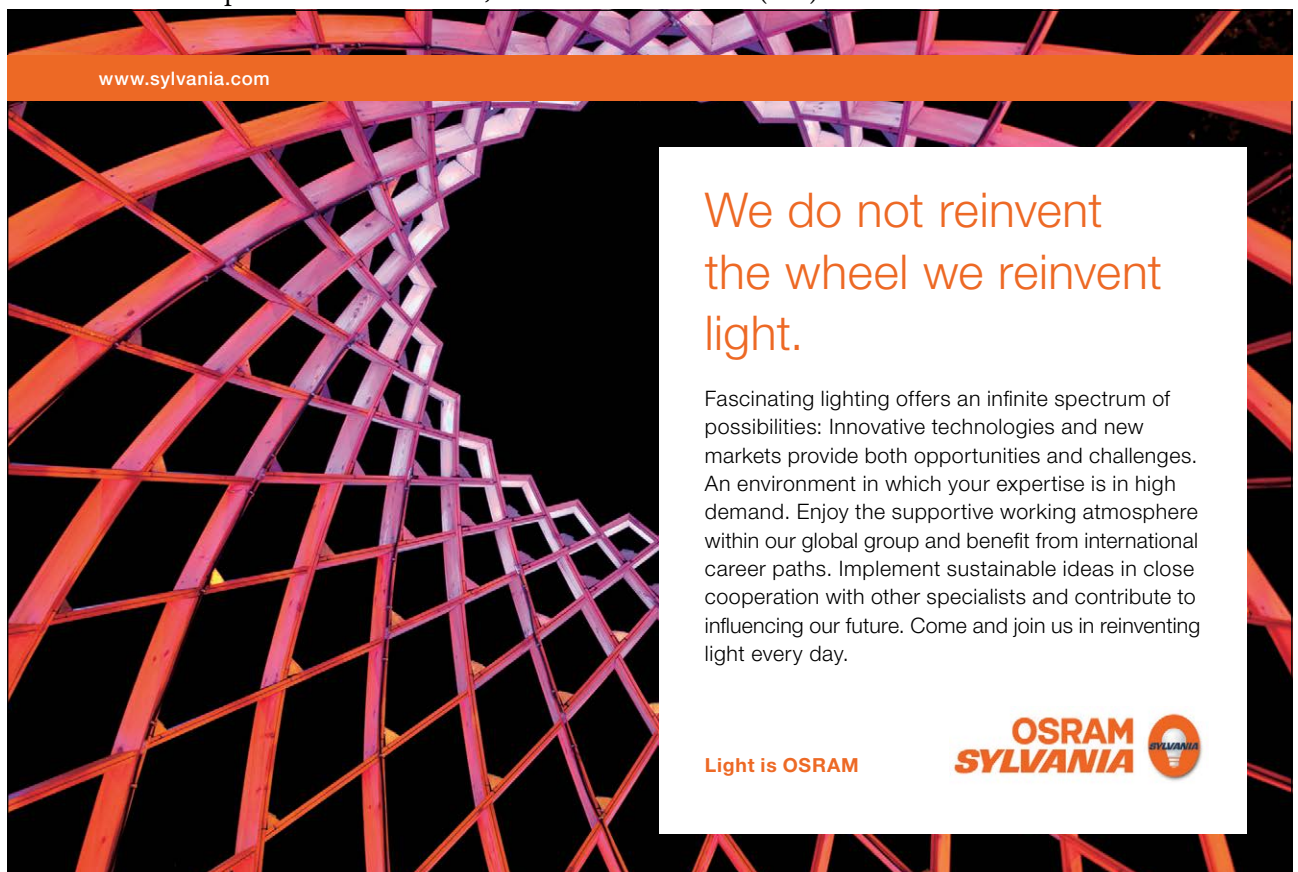
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