

6 University Business Collaboration

“When there is teamwork and collaboration, wonderful things can be achieved.”

MATTIE STEPANEK (1990–2004)

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6.1 Introduction

University/business collaboration has had an extensive history (Bower, 1993) and there has been a considerable increase in these types of partnerships in the United Kingdom (Duggan, 1997; Powers, 2003), European Union (Caloghirou et al, 2001) and the United States (Baldwin and Link, 1998; Mansfield, 1998), for example. Such an increase is believed to be due to a combination of pressures on both universities and businesses (Meyer-Krahmer and Schmock, 1998; Santoro, 2000). For universities pressures include rising costs, funding and the growth of new knowledge – these have resulted in resource pressures on universities who have sought relationships with businesses to maintain subject area market leadership (Hagen, 2002; Nimitz et al, 1995). For businesses pressures include global competition, short product life cycles and technological change (which have transformed their competitive environment) (Ali, 1994; Bettis and Hitt, 1995). Due to societal pressure on universities they are seen as “engines for economic growth” rather than their past social remit (Blumenthal, 2003; Cohen et al, 1998). Pressures such as these have led to university/business collaborations for the enhancement of economic competitiveness and innovation (Ankrah, 2007). Within this context Autio and Laamanen (1995) talk about “the ability to recognise technical problems, the ability to develop new concepts and tangible solutions to technical problems, the concepts and tangibles developed to solve technical problems, and the ability to exploit the concepts and tangibles in an effective way” (p. 647). Further to this, knowledge transfer is considered different to technology transfer since knowledge transfer is a wider set of activities than technology transfer (Gopalakrishnan and Santoro, 2004). Technology transfer is viewed as an exchange process by Burati and Penco (2001) where a collaborative venture transpires involving a technology donor and recipient working in partnership to adapt and develop technologies (with the aim of dealing with the customisation of technology required to develop specific applications, applying new technology to create value for the recipient taking into account both internal and external factors, and the needs of potential users).

According to Ankrah (2007) there is a large amount of research on university – industry partnerships especially with regard to technology and knowledge transfer. As a consequence considerable literature is in existence regarding mechanisms developed for interaction between industry and university and collaborative outcomes (Ankrah, 2007). There is also considerable literature available regarding the university/business relationship. Furthermore, what has been published could be described as ad hoc in nature (Ankrah, 2007) and also on a regional basis (Smilor et al, 1990). The nature of the literature shows that co-operation between universities and industry was considered to be less important before 1990 than after (Howells and Nedeva, 2003; Nimitz et al, 1995; Poyago-Theotoky et al, 2002). Since university – industry, and particularly university – business relationships are evolving, contemporary papers build on the findings of the early literature (Blumenthal, 2003; Geisler, 1995; Howells et al, 1998, Newberg and Dunn, 2002). This chapter therefore seeks to answer the research question “what is the nature of the management of the university/business relationship?”

6.2 Organisational aspects of university/business collaboration

Various types of inter-organisational relationships undertaken in practice are reported in the literature and these include interlocking directorates, trade associations, alliances, consortia, networks and joint ventures and these vary according to partnership linkages (Barringer and Harrison, 2000). In fact, it has been observed that in the literature a number of terms are used to describe the different inter-organisational relationships (Chiesa and Manzini, 1998). Furthermore, it is concurred that co-operative arrangements take various forms to a varying degree of complexity and partner involvement (Geisler, 1997). Indeed, it is posited that the possibility for university – industry relationships are fairly wide (Shenhar, 1993). Moreover, forms of university – industry inter-organisational relationships in the case of technology transfer occur according to the technology flow and the length of the relationship (Figure 6.1) (Chen, 1994).

Four classifications for university industry inter-organisational relationships have been given and these are research support, co-operative research, knowledge transfer and technology transfer (Santoro, 2000). Research support includes endowments and trust funds, co-operative research – informal intentions, institutional facilities, group arrangements, institutional agreements, knowledge transfer – co-operative education, institutional programmes, personal interactions and technology transfer – commercialisation activities and product development through research centres at universities (Santoro, 2000).

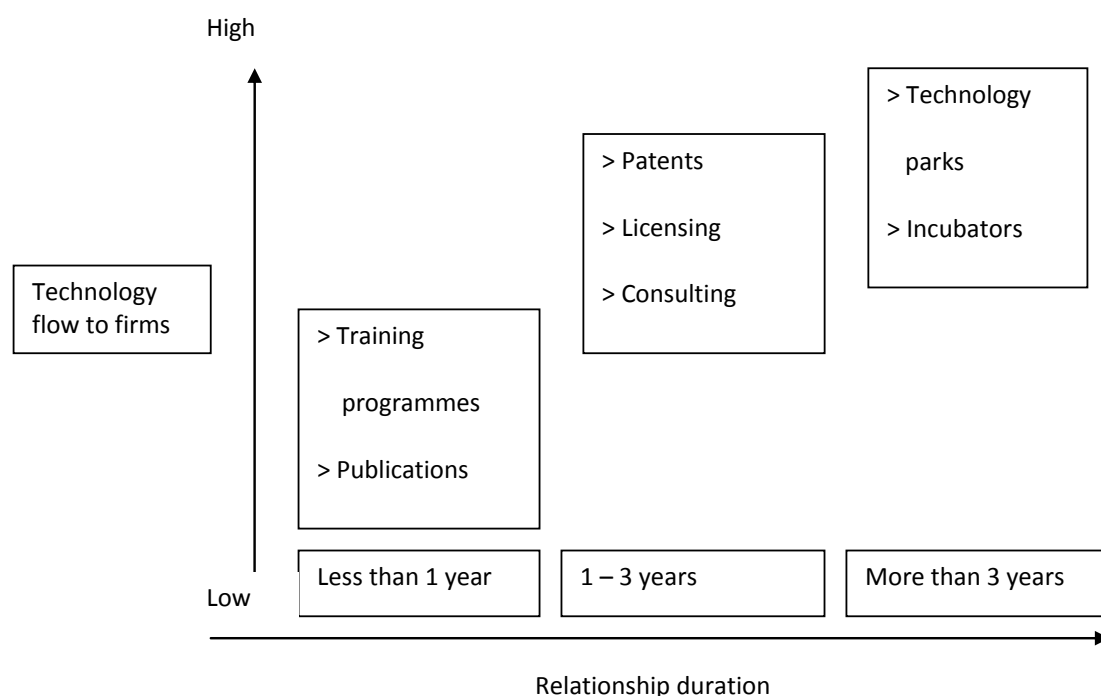


Figure 6.1: Technology transfer mechanisms (Source: Chen, 1994, p. 451)

It is considered that the creation of a typology that illustrates the possible links between universities and industry, and more specifically between universities and businesses, is not easy (Blackman and Seagal, 1991). Furthermore, the framework of Bonarccorsi and Piccaluga (1994) is reasonably wide and consists of the categories of the creation of focused structures, formal non targeted agreements, formal targeted agreements, personal informal relationships and personal formal relationships. It is noted by Bonarccorsi and Piccaluga (1994) that these six groups provide an increasing involvement level according to the degree of formalisation, length of agreement and organisational resource involvement from the university. In fact a university's resource involvement progresses from formal personal relationships through the categories to focused structures where there is a university wide involvement in industry collaboration structures (Bonarccorsi and Piccaluga, 1994).

Formalisation of agreement can exist for personal formal relationships and third parties whilst in remaining groupings formalised relations are evident (Bonarccorsi and Piccaluga, 1994). The issue of formalisation is considered to be significant since formalisation and monitoring of inter-organisational relationships can cause disagreement and loss of trust amongst partners through them attempting to retain independence for their organisations in a situation where interdependence is increasing (Ring and van de Ven, 1994).



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6.3 Motivations for university/business relationships

From the literature on inter-organisational relationships between 1960 and 1990 six critical contingencies have been posited by Oliver (1990) across linkages, settings and organisations and these are necessity, asymmetry, reciprocity, efficiency, stability and legitimacy (Oliver, 1990). According to Oliver (1990) two delimiting assumptions are behind the determinants which are that deliberate decisions are assumed to be made to form an inter-organisational relationship by organisations and an organisational perspective involving a top management approach is assumed (the determinants can also explain lower reasons) (Oliver, 1990). The six contingencies show strong correlation with alliance strategy motives (Eisenhardt and Schoonhoven, 1996). Motivations for universities and businesses engaged in inter-organisational relationships appear to closely align with the six critical contingencies/determinants (Oliver, 1990) as motives for organisations to embrace inter-organisational relationships.

Many governments are encouraging collaboration between universities and businesses, in a situation of rapid technological change and international competition, for wealth creation through improving innovative activity (Barnes et al, 2002; Schartinger et al, 2001). It appears that a significant issue for policy making by governments, especially with regard to research council budgets, is the operation of the university – industry interface to enable the exploitation of research to be transferred to industry for economic growth (Hall, 2004; Lopez-Martinez et al, 1994). Universities therefore encourage university – industry relationships in accordance with government and institutional policy (Howells et al, 1998). Whereas industry offers expertise in product development, commercialisation, market knowledge (Sherwood et al, 2004) and employment openings for graduates (Lee and Win, 2004; Santoro and Betts, 2002) universities offer research infrastructure and expertise (Sherwood et al, 2004). Therefore, in order to take advantage of these mutual advantages, there is motivation for universities to develop relationships with industry (Ankrah, 2007).

Increasing pressure on public finance for universities, against a background of government grants for university industry initiatives (Harman and Sherwell, 2002), has given an incentive for universities to look for other revenue to fund research and equipment. This has been through the exploitation of intellectual property rights, licensing of patents and the commercialisation of research to reduce university dependence on public funds (Logar et al, 2001). It has also been reported that relationships with industry appeal to universities since there is more bureaucracy involved with public funding than with industrial funding (Blumenthal, 2003; Santoro and Chakrabarti, 1999). It has also been reported that academic staff are motivated to enter into relationships with industry through personal financial gain (Siegel et al, 2003; Siegel et al, 2004).

It has been found that organisations are motivated to enter into inter-organisational relationships to attain dependability and predictability in order to respond to environmental uncertainty (Oliver, 1990). Related motivations have included the shift to the knowledge based economy and the change in university industry relationships to partnerships from sponsorship involving ongoing interaction (Jacob et al, 2000). Considerable resource pressure has affected universities due to the growth in new knowledge which has resulted in universities entering into alliances with industry to stay at the forefront of academic areas in terms of subjects and research (Ankrah, 2007). In particular university academics consider such links to provide opportunities to enable them to train and place students, develop skills, and develop and test theories (Cyert and Goodman, 1997). It has also been posited that universities undertake collaborative arrangements with industry, including businesses, to enable students and academics to solve practical problems through project work, undertake instructional case studies, gain insights from industrial research and to gain exposure to industrial environments (Meyer-Krahmer and Schmoch, 1998; Santoro and Chakrabarti, 2001). These activities contribute to the improvement of teaching quality and curriculum development (Santoro and Gopalakrishnan, 2001; Meyer-Krahmer and Schmoch, 1998). Moreover, it has been suggested that a significant incentive for Higher Education Institutions (HEIs) to partner with industry, including businesses, is for journal publications (Harman and Sherwell, 2002).

Due to the need for universities to enhance their image they will form relationships with industry (Lopez-Martinez et al, 1994; Mora-Valentin, 2000) and there are societal, political and public pressures for them to show their economic relevance to society and to exhibit entrepreneurship and social accountability (Cohen et al, 1998). Through the need for knowledge and technology transfer, and diffusion, they will be motivated to enter into collaboration with industry in order to drive economic development (Blumenthal, 2003; Hagen, 2002; Siegel et al, 2003; 2004). In relation to this it has been found that a fundamental motive of scientists in universities is for recognition in the industrial scientific community (Hagstrom, 1965) and this can be achieved by research grants, presentations at international conferences and joint publications (academic eminence can be achieved through industry supporting university research) (Siegel, et al, 2003; 2004).

Due to the fast changing technological and competitive environment governments have taken action to support research interaction between universities and businesses since it is considered that universities can support economic regeneration and act as engines of economic growth through dissemination of expertise and knowledge by higher education industry linked partnerships (Bettis and Hitt, 1995; Mora-Valentin, 2000). National and regional research programmes have been created by governments and a good example of these in the UK are the Knowledge Transfer Partnerships (KTPs) (Caloghirou et al, 2001), and businesses can benefit from these programmes through collaboration with universities (Howells et al, 1998).

Motivation for businesses to enter into inter-organisational relationships with universities is for financial gain from the commercialisation of academic based technologies and many businesses will require exclusive rights to technologies (Siegel et al, 2003). Industry is therefore interested in controlling the direction of academic research as well as control of the technologies generated (Newberg and Dunn, 2002; Rappert et al, 1999; Siegel et al, 2003). Other motivations for firms to subscribe to university – industry inter-organisational relationships are to have access to students and for hiring and most collaborative research programmes will seek to target the most able students (Bloedon and Stokes, 1994). According to the OECD (1990) university staff and senior researchers will undertake consultancy work for the time they are allowed to undertake activities outside academia.



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There will be several motivations for businesses to have inter-organisational relationships with universities from a standpoint of efficiency (Ankrah, 2007). It has been reported that university – industry research increases patenting activity, research and development (R&D) and firm sales (Cohen et al, 1998). Businesses will partner with HEIs for knowledge creation and exploitation, cost savings, innovative activity and research outputs (George et al, 2002). This will result in businesses having competitive advantage and improved financial performance (Grant, 1996). The enhancement of R&D and technology growth through grants, tax credits and a legal environment underpinning R&D is another motivation for government (Barnes et al, 2002; Bramorski and Madan, 1993). Continuing professional development (CPD), multidisciplinary leading technologies, advanced expertise and research facilities as part of human capital development will also be industrial motives since there will be enhanced competitive advantage and the shortening of life cycles (Bonaccorsi and Piccaluga, 1994).

The move to the knowledge based economy has been considered to be an influencing factor for businesses to enter into relationships with universities (Santoro and Betts, 2002). It has also been concluded that academic research has augmented the ability of businesses to resolve complicated problems (Pavitt, 1998). According to Howells et al (1988) and Klofsten and Jones-Evans (1996) university – industry partnerships are a good way of influencing technology-based firms, especially businesses to achieve growth. Lopez-Martinez et al (1994), in their study on university – industry relationships, have illustrated that the lack of in-house ability by industry to undertake technological research has been an important business executive motivation. It has also been found that for firms with an R&D capacity collaboration is still appreciated since it enhances limited human and financial resources and reduces risk (Hicks, 1993). Research networks with other universities and firms and the potential for more complicated collaborative arrangements such as consortia with multiple businesses and universities are a motivation for businesses to enter into inter-organisational relationships with universities (George et al, 2002; Cyert and Goodman, 1997).

It has also been found that businesses can improve their standing by associating themselves with leading universities (Siegel et al, 2003) and links with prominent research universities are believed to increase a firm's position with regard to important stakeholders (Mian, 1997).

6.4 Formation Process

Out of the models on the process of inter-organisational relationship formation (Tuten and Urban, 2001) a model which is believed to be relevant for university – industry inter-organisational relationships formation is the Mitsuhashi (2002) business to business alliance formation model which describes a five stage alliance formation process (Figure 6.2).

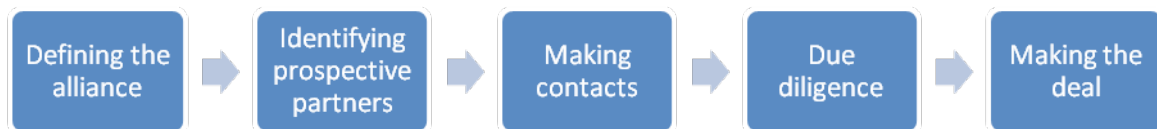


Figure 6.2: The Alliance Formation Process (based on Mitsuhashi, 2002, p. 113)

The initial stage in the formation of a university – business inter-organisational relationship is the determination of the purpose of the partnership and this will be followed by finding an actual partner (Mead et al, 1999) and a number of criteria have been proposed for the selection of partners (Champness, 2000; Dodgson, 1991). It is, however, believed that efforts should be made to undertake prospective partner evaluation, no matter what partner selection criteria are adopted, since there are benefits including ensuring that the collaboration is appropriate (Barnes et al, 2002).

It has been found that if partners have previous experiences of co-operation then the outcomes of inter-organisational relationships are better (Dill, 1990; Geisler, 1995). Existing relationships between partners are crucial since, where experience with an existing partner exists, trust will be developed and universities and businesses will adjust to the demands, evolution and expectations of previous alliances (Gulati and Gargiolu, 1999). Previous collaboration experience (Schartinger et al, 2001) will be important from earlier research, technological and personal interactions and this will reduce organisational and personal obstacles and enhance contact between universities and businesses.

During the formation stage it is critical to define administrative and managerial responsibilities for the inter-organisational relationship, involving financial accountability, and a suitable partnership objective is for the partners to select a project manager (equal collaborative participation by partners will be important) (Peterson, 1995). A project plan needs to be agreed by partners with the specification of milestones (Buttrick, 2000). Differences between partners should be dealt with to avoid collaboration conflict, specification of interim, and end delivery provided, and measures of success identified (Peterson, 1995).

Depending on the complex and formal nature of the inter-organisational relationship it will be essential to have it legally bound by a contract to underline the commitment of the partners (Kanter, 1994; Burnham, 1997). For the inter-organisational relationship of universities and businesses the intellectual property agreement will be the same as the legal document and will specify partner agreements and relationships during, and after, the project collaboration approved by partners (Ankrah, 2007).

6.5 University/business Inter-organisational relationships

The university and business inter-organisational relationship will enter the operational stage (Sherwood et al, 2004) following its formation and this involves a constant evolutionary and learning process (several factors will influence this relationship) (Doz, 1996; Ritter and Gemünden, 2003). A number of activities will take place between the organisations during the operational phase and these will have the objective of attaining the goals of the inter-organisational relationship (Ritter and Gemünden, 2003). In the literature a number of factors are found to induce or restrict inter-organisational relationships between universities and industry (Azaroff, 1982; Dean, 1981; Fowler, 1984). These include capacity and resources, legal issues, institutional policies and contractual mechanisms, management and organisational issues, issues relating to the technology, political issues, social issues and other issues (Ankrah, 2007). The complex interaction of these factors, with the resultant positive and negative impacts, will determine the success of a collaborative project (Barnes et al, 2002). In particular, managerial and organisational issues are critical factors inducing or restricting relationships between universities and businesses (Siegel et al, 2003). It is also considered that substantial managerial effort is needed for university and industry inter-organisational relationships to succeed taking into account the cultural nature of the partners concerned (Dodgson, 1991).

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6.6 Conclusions

With regard to the research question “what is the nature of the management of the university/business inter-organisational relationship?” a number of typologies have been developed to express the diversity of relationships that may be employed in the collaborative process. Freeman (1991) distinguishes between the following: joint ventures and research corporations; joint R&D agreements; technology exchange agreements; direct investment motivated by technology factors; licensing and second-sourcing agreements; sub-contracting, production-sharing and supplier networks; government-sponsored joint research programmes; computerised data-banks for technical and scientific interchange; and informal or personal networks.

Although there have been many studies indicating the importance of formal relationships for the transfer of technology, a number of recent investigations have also highlighted the key role played by informal relationships as a means for sourcing ideas and information during the development process (Kreiner and Schulz, 1993; Shaw, 1993). However, in relation to informal exchange, this research has typically been anecdotal in nature. This view is supported by Freeman (1991) who argues that ‘although rarely measured systematically...informal networks are extremely important, but very hard to classify and measure’. More in-depth and systematic studies of informal interaction in the innovation process do exist, but these have been largely exploratory and have not been examined in different regional or technological contexts.

It has been noted in the literature that closely related to the subsequent benefits realised are the motivations (Geisler, 1995; Lee, 2000). There is also evidence that there is a positive relationship between outcomes and motivations (Lee, 2000). Although the benefits of university and business inter-organisational relationships will outweigh any costs it is necessary for both sides to be aware of any limitations so that action can be taken to alleviate any problems through management procedures and policies (Harman and Sherwell, 2002). By doing this it will be possible to ensure that the relationship is successful and to make failure less likely (Ankrah, 2007). This will also ensure that the goals of both universities and businesses are met (Harman and Sherwell, 2002).

Recommended Reading

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