

Angels with Dirty Faces! The Potential Role of Business Angel Networks in exploiting University-Generated Intellectual Property

**Mr Simon McCarthy, Head of Professional Programmes,
Business School, University of Glamorgan**

Llantwit Road, Trefforest,
RCT CF371DL United Kingdom
Tel: 01443482471 Email: smccarth@glam.ac.uk
Website: <http://www.glam.ac.uk>

**Dr Gary Packham, Head of Programmes,
Business School, University of Glamorgan.**

**Professor David Pickernell,
Business School, University of Glamorgan**

Abstract

Objectives

Universities are increasingly encouraged to take a leading role in economic development, particularly through innovation. Simultaneously, economic development policy itself is increasingly focused on Small and Medium sized Enterprises (SMEs), creating overlapping interactions in the roles of government policy, universities, and SMEs, and processes of innovation creation and dissemination. This paper is part of a study evaluating if and how potential benefit can be delivered by working with Business Angels to accelerate the commercial application of university research outputs through licensing. In particular it considers the potential role of the business angel in acting as a "broker" for university created IP, and the perceptions of the business angel networks in this process.

Prior Work

Knowledge creation and utilisation has become a cornerstone of modern economic activity and policy makers have increasingly sought ways to encourage this. Higher Education Institutions in particular have been encouraged to take a larger role in economic development through innovation. This project also reflects the importance of growth orientated small firms on national economies and the impact of business angel investment / involvement in particular in such early stage firms.

Approach

A mixed method approach was taken consisting of a combination of a quantitative method (web-based questionnaires, included within an email, distributed to business angel network managers) and a qualitative method (focus group interviews with those who attend the presentation of “parked” University IP ideas at a University-organised event) were undertaken.

Results

These results suggest that business angel network managers, who often act as both gatekeepers and brokers for the business angels in their network, currently have a number of concerns and reservations about the use of business angels in university IP commercialisation. Whilst these may partly be due to an unfamiliarity with the concept and a consequent need to explain it more clearly, there also seems a consistent message that business angels, whilst having a range of overlapping skills that may be used for a range of activities that would assist universities in commercialisation of their IP, in general are likely to want to opt for their traditional role.

Implications

This may require a re-examination of the incentives offered to the business angels and, given the heterogeneous nature of business angels, a more focused approach to identify the subset most likely to be interested in university IP. For this, however, the role of the business angel network manager is likely to be crucial, suggesting that incentives for their involvement may also be required

Value

The key contribution of the paper is that it provides additional findings to which may contribute to government policies on the commercialisation of university innovation, in particular the potential role of business angels and business angel networks in this.

Key words: Key words: Innovation, Entrepreneurship, Universities, SMEs, Local, Cross-Local. Intellectual Property, Business angel networks, Business Angels

INTRODUCTION

This paper is part of a study evaluating if and how potential benefit can be delivered by working with Business Angels to accelerate the commercial application of university research outputs in Wales through licensing. In particular it considers the potential role of the business angel in acting as a “broker” for university created IP, and the perceptions of the business angel networks in this process.

Knowledge creation and commercialising university generated intellectual property

As highlighted in Pickernell et al, (2008), knowledge creation and utilisation have become cornerstones of modern economic activity and policymakers have increasingly sought ways to encourage this. Researchers also increasingly acknowledge that, due to rapidly changing and highly competitive markets, growth oriented small firms are starting to exert a significant influence on national economies (Yeh-Yun-Lin 1998) and are responsible for making a disproportionate contribution to wealth and employment creation (Delmar and Davidsson 1998; O’Gorman 2000) within an economy. Higher Education Institutions (HEIs) have also been encouraged by government policy to take a larger role in local economic development, through innovation (Cooke et al.. 2000; Boucher et al. 2003), particularly as the responsibility for knowledge and innovation is increasingly seen as occurring through the melange and intersection of industry, universities and government.

There are a range of fora and structures, for example, in which and through which knowledge creation and dissemination from universities can occur. This includes direct spinouts of companies, but also via collaborations with various stakeholder groupings from industry supply chains, government institutions and other universities. Cluster and network theory (Wright et al. 2004), for example suggests a range of formal and informal mechanisms in which knowledge creation and dissemination can be encouraged such as licensing and technology transfer.

Increased government policy efforts have also been made in many countries to commercialise the outputs of university research in some way. Some of these

initiatives have been set up within Higher Education institutions (for example technology transfer offices, incubators, enterprise centres etc), whereas other initiatives have been introduced from the government. Perhaps the Bayh Dole act in the United States is the best known example of government intervention in the intellectual property arena. This act focussed on the ownership of IP in particular and transferred the ownership from the publicly funded research grant agencies to the Universities. Within Wales, the Technium and Spin out programmes are examples.

Reid and Schofield (2006), highlight the potential use of technology “brokers” as conduits or fora through which knowledge and innovation transfer from academia can occur, and it is here that the (non-financial) role of the business angel may come to the fore.

Business angels and value added

Many studies over the last three decades have supported the role of venture capitalists / Business Angels contributing to the success of their ventures in numerous ways other than simply providing finance (Berger & Udell, 1998, Harrison and Mason 2000, Mason and Harrison 2000a, Sorheim 2005). However, others (Barry 1994, Prowse 1998, Wong 2001, Chemmanur and Chen 2003) believe that the informal venture capitalist does not add significant non-financial value to their investee companies.

The exact methods by which business angels add value has been and continues to be an area of debate. Large and Muegge (2008), however, recently reviewed 20 empirical studies pertaining directly or indirectly to non-financial value added (NFVA) by venture capitalists and attempted to identify areas of agreement and disagreement in the previous studies regarding NFVA. From this they created an eight category typology of NFVA inputs that encompassed the findings in the previous studies. Two of the categories are external environment orientated and the other six have an internal environment orientation.

The internal orientated categories are recruiting activities (recruiting / advising on the recruitment of new employees), mandating activities (determining the management teams engagement), strategizing activities (contributing towards the overall strategy of the business), mentoring activities (providing informal guidance,

mentoring etc), consulting activities (providing arms length planned and structured knowledge) and operating activities (direct managerial involvement).

The two external oriented categories are "Legitimation" and "Outreach". Legitimation is the process by which certain attributes such as credibility, reputation, validation etc accrue to the venture from its association with the venture capitalist. Outreach encompasses activities that add value by establishing and developing connections to external stakeholders such as potential customers, marketing contacts etc. Large and Muegge (2008) also state that the evidence to date suggests that operating and outreach are the most important categories of NFVA. Related to this outreach role, business angels are also often known to co-invest and be active in several strategic and managerial activities of portfolio firms (Landstrom, 1993, Stevenson and Coveney, 1996, Mayfield and Bygrave 1999, Mason and Harrison 2000, Sorheim and Landstrom 2001), which also makes them useful in linking firms and Intellectual Property(IP).

A similar study by Politis (2007) reviewed previous studies relating specifically to Business Angel added value and broadly categorised the "value adding roles" as, providing a sounding board / strategic role, providing a supervision and monitoring role, providing a resource acquisition role and providing a mentoring role.

This paper considers the views of Business Angel Networks in particular, of the role that business angels and informal investors can play as conduits between universities and SMEs to maximise the utilisation benefits from innovation-related IP creating activities. This is because the attributes of business angels make them potentially useful in exploiting university generated ip. Indeed, the Commercialisation in Wales report (Gibson 2007) noted that "Experienced entrepreneurs working with academics undoubtedly form the best solution in understanding the dynamic nature of markets and in judging how to adapt intellectual property to create successful commercial enterprises".

The views of the business angel network managers are of particular importance, given that they are important conduit between business angels and investment opportunities. BANs exist to provide a channel of communication between private venture capital investors (business angels) and entrepreneurs seeking risk capital

(Mason and Harrison, 1993, 1997) and can perhaps be seen as both a "dating agency" and a "filtering mechanism" in business introductory terms.

Business Angel definition and market size uncertainties

Analysing the role of the business angel is, as highlighted earlier, an area which currently has a number of uncertainties, suggesting the need for further research. There is, for example, no generally accepted definition of what informal venture capital is. This poses a problem when estimating the size of potential business angel capacity. Avdeitchikova, Sofia (2008) discussed three key problems when defining informal venture capital. Should investments from friends and family "love money" be included, should virgin or potential investors (those matching an investor profile, but not making any investments) be included and finally whether all individuals who had made at least one investment should be included (is there a "history cut off point", for example do we only include angels who have been active in recent years)?

Mason and Harrison (2008) make a more basic definition of a business angel as "an individual acting alone or in an formal or informal syndicate, who invests their own money directly in an unquoted business in which there is no family connection". This definition, however, does not consider investments in friends' businesses, the number of investments made or recent activity. The questionnaires used in this study were based on a definition of an Active Business Angel as "an individual who has previously made informal investments, either acting alone or in a formal syndicate, who invests their own money, directly in an unquoted business in which there is no personal or family connection". This definition therefore excludes virgin or potential investors, inactive investors and investments made in friends businesses.

Regardless of definitions, however, given that the fundamental nature of the business angel market is informal, obtaining a reasonably accurate estimate as to the size of the market in the UK is problematic. Business angels are known to operate in obscurity (Prowse 1998) as most angels share a desire for anonymity and do not have to divulge information about their investment activities. The European Commission (2003) argues, therefore, that "all inferences about the true and potential size of the angel investment market are based on guesswork".

In the UK, Mason and Harrison (2000a) estimated, for example, that there are between 20,000 and 40,000 business angels who invest between £500 million and £1 billion per annum in around 3,000 to 6,000 businesses. More than half of these investments are in businesses at their seed, start-up and early stages of growth. Mason and Harrison (2000) also found that informal investors make eight times as many investments and invest as much capital as institutional venture capital investors. Currently, the British Business Angels Association estimate that each year private investor's account for between £800 million and £1 billion of early stage investment in the UK: the single largest source of early stage capital in the country. Conversely, the British Venture Capital Association reports that venture capital funds invested in 1330 businesses in 2007, of which only 502 (35%) were early stage. The total amount invested in UK early stage companies by volume fell from 9% of the total in 2006 to 4% in 2007 (BVCA 2007).

For this study, linking academics and business angels / business angel networks, we will focus on accessing business angels who have explicitly designated themselves via their participation in business angel networks, mainly focused on members of the British Business Angels Association generally and Welsh Business Angels in particular.

The only business angel network, explicitly for Wales, however, is Xenos limited. This was incorporated in 1997 by the Welsh Development agency as part of Finance Wales Plc. The network is wholly owned by Finance Wales Plc, an independently managed body that works in partnership with other public and private sector organisations to close the "capital gap" from which Welsh firms suffer in comparison with those in more prosperous parts of the UK (Jones-Evans and Brooksbank, 2000). Official records from Xenos indicate that there are presently only about 120 business angels registered with the Wales business angel network (XENOS Newsletter 10).

It also has to be recognised that business angel activity in Wales was amongst the lowest in the UK, although there has been a major increase in recent years. The 2000 GEM Wales executive summary report found Welsh business angel participation rate in start up businesses to be just 0.5%, thus placing Wales business angel activity as the lowest of all 23 nations sampled (Jones-Evans and Brooksbank, 2000).

The 2007 GEM Wales executive summary (Jones-Evans Thompson and Hill, 2007) shows that business angel participation rate has increased to 1.35% (scaled for GVA). These figures alone, however, are not sufficient to give a "complete picture" as the business angel investments have potential to range from a few hundred pounds to hundreds of thousands. The median business angel investment made in Wales over the 3 years covered by the 2007 GEM Wales executive summary is the lowest of all UK regions at £3,876. The medium rather than mean is used because the distribution of informal investments is positively skewed and a few very large investments. The mean investment is £24,336 for the three years. Xenos reported that over £2,000,000 of deals in 17 companies were brokered by the network in 2008, this figure once again showing an increase on previous years. Despite the increase recorded in 2008, the activities of the Wales business angel network remains low compared with other regions in the UK.

This highlight's therefore a need to also examine the potential for business angel networks outside Wales to exploit IP created within it. This is also justified given Lambert's (2003) evidence that universities often currently collaborate with firms outside of their localities. In addition to the business angels themselves, there would seem to be a need to seek the views of two other sets of stakeholders. First of all, there are the business angel network managers, who can act as gatekeepers of information to the wider network. Secondly, given Bains (2005) analysis there is a need to examine the views of academics within the universities from which commercialiseable knowledge and innovations would need to come.

METHODOLOGY

In terms of the techniques consequently required, a mixed method approach was taken, consisting of a combination of a quantitative method (web-based questionnaires, included within an email, distributed to academics, business angel network managers, and their business angel members) and a qualitative method (focus group interviews with those who attend the presentation of “parked” University IP ideas at a University-organised event) were undertaken. This event was organised bringing together business angels, academics who had developed / were developing I.P, business angel network managers and various other interested parties. The objective of the event was to further explore what was needed to develop a beneficial framework, which will allow business angels to contribute to the commercialisation of university generated I.P.

In addition to issues unique to web based questionnaires, more general issues such as questionnaire design, subject confidentiality, data analysis, subject selection, distribution method, questionnaire piloting and data analysis were all addressed when developing the questionnaire. The questions in the three questionnaires have evolved from a review of the existing literature, the authors’ knowledge and informal discussions with a variety of stakeholders connected with the development and exploitation of ip, business angels, business angel network managers and knowledge transfer experts.

Using a web based questionnaire embedded into an email has a number of advantages, including being able to directly communicate with the prospective respondents, which a more typical web based survey does not have and the advantage offered by all web based questionnaires of a low cost and quick distribution and also to store responses directly into a database, eliminating transposition errors and providing easier subsequent analysis. The use of a traditional paper based questionnaire was also considered, but given the advantages mentioned above and previous research (Yun & Trumbo, 2000) confirming that electronic survey results do not differ from traditional postal survey content results in the substantive analysis, the decision to use a web based questionnaire was made.

Prior to being distributed, the three questionnaires were piloted amongst a group which included both academic colleagues and also external contacts of the research team. In addition to looking at the questionnaires themselves, the pilot group also completed it in order to ensure the questions were unambiguous, clear and relevant. The suitability of the data generated for further analysis was also examined at the piloting stage, as were deliverability issues.

Initially the questionnaires were developed using Question Mark Perception software, but the pilot testing highlighted issues of the questionnaires visual appearance and more importantly, significant data analysis-related issues. As a result of these, a decision was made to proceed with the online questionnaire using E-survey Pro rather than question mark perception.

The business angel network managers were identified through a combination of the British Business Angel association listing of networks, google searches, the research team's knowledge and a review of existing literature in the area. There may be other groups making investments, but the networks identified represented all networks which could be explicitly identified as Business Angel Networks in the UK.

The network managers were contacted up to three times. The use of a single email containing both a cover explanation and a survey is not likely to receive a favourable reaction (Sheehan, 2001). The sending of the first email was preceded by a telephone conversation with the network to identify the most suitable person to answer the questionnaire and subsequently speaking with the intended recipient. The telephone conversation also briefly explained what the project was, why their views were important and that an email incorporating a questionnaire would be sent. Preliminary notification by telephone or by letter is an effective way of substantially increasing response rates (Chiu and Brennan, 1990), this approach does however substantially increase the time necessary to complete the research.

Following the sending of the email containing a cover explanation of the project and questionnaire link, a follow up reminder email, which also contained an invitation to attend the piloted event was sent. Previous studies (Deutskens et al 2004, Sills and Song 2002, Dillman 2000, Sheehan and Hoy 1999) support the view that follow up reminder emails increase the response rate.

RESULTS

In total, 8 responses were received, representing a response rate of around 33%. Whilst this can be considered good for this type of survey, the low numbers in the population require caution to be applied to the results. In this case, therefore we will only undertake a univariate reporting of the Business Angel Network Managers Survey Results, using them to guide the analysis undertaken later, and highlight key areas for further investigation. Before this, however, we will outline the scale and scope of the respondents, using a number of key variables, to determine their applicability to the case study.

Background Questions

As can be seen from table 1 the networks the managers represent contain business angels from all the regions and nations of the UK, though, unsurprisingly, London and the South East of England are best represented.

Table 1: Member of Location by Regions

Region	% of Respondents	Number of Respondents
Wales	50%	4
Scotland	25%	2
Northern Ireland	12.5%	1
South West England	50%	4
South East England	62.5%	5
London	87.5%	7
Eastern England	37.5%	3
East Midlands	50%	4
West Midlands	50%	4
North West England	25%	2
Yorkshire and Humberside	25%	2
North east England	25%	2

Note: Multiple response question. Total Respondents = 8

Encouragingly, Wales and the surrounding regions of England (South West, East Midlands and West Midlands) also have 4 networks where business angels are represented in the network. This is encouraging for future activities, given that, from the literature, business angels usually prefer closer geographical distance to the firms they are investing in. This view is also supported by the results in the Table 2 which indicate that the business angels represented in the responding network managers networks prefer the firms they invest in to be within 100 miles of their own location.

Table 2: Average 'Comfortable' Distance between Business Angel and firm Within Network

Distances (Miles)	% of Respondents	Number of Respondents
Up to 50 miles	28.57%	2
51-100 miles	71.43%	5
101-200 miles	0.00%	0
over 200 miles	0.00%	0
Total	100%	7

Note: 1 respondent did not respond to this question

Attitudes towards the Concept

The opinions of the managers towards the use of business angels generally in University IP commercialisation are, as can be seen, not particularly favourable, with only a minority seeing this as an area of general interest (Table 3).

Table 3: Do you think, generally, that business angels would be interested in being involved with University IP commercialisation opportunities?

	% of Respondents	Number of Respondents
Yes	37.50%	3
No	62.50%	5
Number of respondents		8

The reasons given were varied, the only common one being that it did not fall within the scope of what a business angel should do. This may indicate a confusion in the minds of network managers over the concept, but also highlights an area for future development, given that network managers are often the "gatekeepers" to the network and the relevance of the concept needs to be clear to them to ensure access to the business angels themselves, particularly if the network managers also play a brokering role, determining which business angels might best be suited to particular IP opportunities.

Reasons as to why Network Managers were not generally supportive of the concept are outlined below in table 4.

Table 4: Reasons for Non Support

	% of Respondents	Number of Respondents
Too much uncertainty about the concept	33%	1
Does not appear to be enough reward in it for the business angel	33%	1
Appears to require too much involvement from the business angel	100%	3
Does not fall within the field of activity of what a business angel should do	33%	1
Number of respondents		3
Number of eligible respondents who skipped this question		2

One of the business angel network managers also commented that :-

"Generalisations where business angels are concerned are dangerous because they are not a natural affinity group. They all have different approaches, experiences and skills and whilst there is a significant overlap in these, they apply them in different ways. Some angels become significantly involved with the businesses they invest in and, therefore, may be similarly attracted to commercialising IP opportunities themselves. However, many are already involved with other projects and businesses and have no desire to commit significant amounts of their time to a single project".

These responses were also replicated when network managers were asked to discuss their own specific network, the table below again showing that only 3 of the network managers saw this as something their own business angels would consider being involved in.

These issues were explored further in Table 5 and 6 in relation to whether network managers felt that members would be interested in getting involved with University IP commercialisation.

Table 5: Do you think members of YOUR business angel network would be willing to consider being involved with University IP commercialisation opportunities?

	% of Respondents	Number of Respondents
Yes	42.86%	3
No	57.14%	4
Number of respondents		7
Number of respondents who skipped this question		1

Table 6: Reasons why members would not support concept

	% of Respondents	Number of Respondents
This is not an area business angels are likely to want to get involved in	25%	1
Business Angels don't have the required expertise concerning negotiation of the license for University derived ideas	25%	1
This area is likely to be seen by business angels as too risky	25%	1
Business Angels are unlikely to have the time to spend on such an activity	25%	3
Do not believe university systems will allow business angels to make a success of any venture	25%	1
Uncertain as to strength, novelty and commercial viability of ideas created by academics	25%	2
Too much physical distance between members of business angel network and the university	25%	3
Concerns about limited direct contact between university researchers and business angels overseeing licensing	25%	1
Number of respondents		4

Again the responses were varied, though the key reasons (expressed by at least 2 of the network managers) were uncertainty over the novelty of the ideas created by the academic, the lack of time business angels were likely to have to spend on such an activity and the physical distance between the business angel and the university (all but one of the business angel networks being outside Wales).

These are interesting responses. The issues over the commercial viability of the idea and the lack of time can be seen as interrelated, perhaps representing a short-term barrier, in that if the commercial viability of University IP has been established and publicised then this is also likely to encourage business angels to both find the necessary time to take advantage of these opportunities. This emphasises the importance of demonstration effects (which the pilot programme will hopefully provide). The issue over distance between the network and the university is also interesting, however, because it again reemphasises the importance of involving network managers and either working (at least to begin with) with those networks closest to the university, or finding ways to reduce the "distance" (e.g. via electronic or other means in ways highlighted in Boschma (2005) for example.

Issues Related to the process of Business Angel Involvement

The network managers were then asked, if their members were to be involved in university IP exploitation, the importance of different types of returns that they might require (table 7).

Table 7: Returns Required for Business Angel Involvement

If members of your business angel network were to be involved in this type of activity, how important do you feel the following types of RETURNS are to their involvement :-

	Unimportant	Of little importance	Of Some importance	Important	Very important	Number of Respondents
Fee from the academic / University for acting as advisor to the academic in developing the IP	14% (1)	14% (1)	42% (3)	14% (1)	14% (1)	7
Fee from the University for developing the marketing of the product	14% (1)	0% (0)	57% (4)	14% (1)	14% (1)	7
Fee from the University for acting as a broker for the University to potential firms	14% (1)	0% (0)	42% (3)	28% (2)	14% (1)	7
Percentage of the IP-related income from the firm adopting the IP	14% (1)	0% (0)	42% (3)	0% (0)	42% (3)	7
Equity share in the company adopting the IP	0% (0)	0% (0)	0% (0)	25% (2)	75% (6)	8
Number of Respondents						8

The table above shows quite clearly that network managers believe that their business angels will, as they would normally do, find an equity share in the company (adopting the IP) as of most importance, followed by a percentage of the IP related income. Greater importance was also attached to the university paying a brokering fee as compared with the other options of fees for advice and marketing. It seems therefore, that network managers perceive the rewards as needing to be primarily equity based, though with importance also placed on IP-related income. One of the network managers commented further that :-

"The IPR MUST be owned by the investee and not by the University for a Successful Equity Investment".

The activities that business angels could be expected to carry out in return for these rewards were also examined, the results shown below in table 8.

Table 8: Importance of the Business Angel Role

Reward Type	Of no Importance	Of little importance	Of some importance	Important	Very Important	Number of Respondents
Investing Finance	0% (0)	0% (0)	25% (2)	12% (1)	62% (5)	8
Helping academic develop IP	28% (2)	57% (4)	14% (1)	0% (0)	0% (0)	7
Coaching academic in presenting idea	14% (1)	14% (1)	42% (3)	28% (2)	0% (0)	7
Helping university market the IP	14% (1)	0% (0)	57% (4)	28% (2)	0% (0)	7
Initial screening of potential firms	14% (1)	14% (1)	42% (3)	14% (1)	14% (1)	7
Detailed screening of firms	14% (1)	0% (0)	42% (3)	28% (2)	14% (1)	7
Brokering / structuring the deal for the IP to potential firms	16% (1)	0% (0)	66% (4)	16% (1)	0% (0)	6
Helping the firm to utilise the idea	14% (1)	0% (0)	42% (3)	28% (2)	14% (1)	7
Helping the firm with broader management	14% (1)	0% (0)	14% (1)	42% (3)	28% (2)	7
Assisting the firm later on with (e.g. obtaining finance from venture capitalists, other networks of investors, etc.)	12% (1)	0% (0)	12% (1)	50% (4)	25% (2)	8
Number of Respondents						8

Again the network managers believed that the most important business angel role was in its traditional roles, of investing finance, assisting with broad management of the firm, identifying sources of future finance for the company, with some level of importance was also placed, in the related area of assisting the firm to utilise the university IP. Concerning assistance to the university, there was some level of importance also placed on screening of firms and marketing the IP, with brokering of the actual deal, and assisting the academic see as much less being the business angels' role.

These attitudes were also emphasised in the final question, which asked who should take the LEAD role in different aspects of a university IP commercialisation programme (Table 9).

Table 9: Who do you believe should take the LEAD role in the following?

	Academic	University	Government / Business Support Programmes	Business Angels	Business Angel Networks	Potential Licensee / Firm adopting the IP	Number of Respondents
Developing the IP before it is used by the firm	50% (4)	25% (2)	0% (0)	0% (0)	0% (0)	25% (2)	8
Consulting role with firm using the IP to further develop the idea	25% (2)	50% (4)	25% (2)	0% (0)	0% (0)	0% (0)	8
Marketing the IP	12% (1)	37% (3)	0% (0)	12% (1)	0% (0)	37% (3)	8
Initial screening of potential firms	0% (0)	50% (4)	0% (0)	12% (1)	37% (3)	0% (0)	8
Detailed screening of firms	0% (0)	37% (3)	0% (0)	12% (1)	25% (2)	25% (2)	8
Brokering the actual deal with firms of the IP	0% (0)	28% (2)	14% (1)	28% (2)	0% (0)	28% (2)	7

Table 9: Continued

	Academic	University	Government / Business Support Programmes	Business Angels	Business Angel Networks	Potential Licensee / Firm adopting the IP	Number of Respondents
Being a conduit for information about this programme	0% (0)	62% (5)	12% (1)	0% (0)	25% (2)	0% (0)	8
Managing the overall organisation of this programme	0% (0)	85% (6)	14% (1)	0% (0)	0% (0)	0% (0)	7
Funding this programme	0% (0)	28% (2)	42% (3)	0% (0)	28% (2)	0% (0)	7
Helping to create syndicates of business angels to take advantage of this programme	0% (0)	25% (2)	0% (0)	12% (1)	62% (5)	0% (0)	8
Investing equity in firms that are using the programme	0% (0)	14% (1)	0% (0)	57% (4)	28% (2)	0% (0)	7
Helping to create syndicates of other types of "later-stage" investors (venture capitalists etc.) to take process further in firms that are using the programme	0% (0)	28% (2)	14% (1)	28% (2)	28% (2)	0% (0)	7
Number of Respondents							8

The results were very interesting in that they showed some areas where there seemed to be consensus between the network managers, whilst in other areas there seemed to be a wider variety of views. More particularly, the role of the business angel as the lead actor was confined to investing equity. By comparison, the business angel network was seen as playing a key role also, the alternative lead actor usually being the university itself. Indeed, the university could be seen, not surprisingly as the key "hub" for many of the activities, not only generation of the IP itself, and managing the programme and providing information about it, but also screening of firms and marketing the IP. The government, by way of contrast was seen as a lead actor only in terms of providing funding. Overall this suggests a need to bring the universities and business angel networks together at an early stage to determine the activities where each should lead.

Network Manager Questionnaire Conclusions

These results suggest that business angel network managers, who often act as both gatekeepers and brokers for the business angels in their network, currently have a number of concerns and reservations about the use of business angels in university IP commercialisation. Whilst these may partly be due to an unfamiliarity with the concept and a consequent need to explain it more clearly, there also seems a consistent message that business angels, whilst having a range of overlapping skills that may be used for a range of activities that would assist universities in commercialisation of their IP, in general are likely to want to opt for their traditional role.

This may require a re-examination of the incentives offered to the business angels and, given the heterogeneous nature of business angels, a more focused approach to identify the subset most likely to be interested in university IP. For this, however, the role of the business angel network manager is likely to be crucial, suggesting that incentives for their involvement may also be required.

Business angel and university ip event, 3rd June 2009:

This event was organised bringing together business angels, academics who had developed / were developing I.P, business angel network managers and various other interested parties. The objective of the event was to further explore what was needed to develop a beneficial framework, which will allow business angels to

contribute to the commercialisation of university generated I.P. The event was publicised primarily via e-mails to business angel network managers.

The original intention was to keep the event amongst the three South East Wales universities, namely Glamorgan, UWIC and Cardiff. However, invitations were subsequently also made to Glyndwr, Bangor, Aberystwyth and Swansea University.

Subsequent attendance at the event consisted of 31 people (all male) consisting of the following numbers from each of the stakeholder groupings:-

- 10 academics presenting IP ideas
- 4 University IP support staff (TTO etc.)
- 7 Business Angels
- 3 Non-Business Angel Finance Providers
- 2 Business Angel Network Managers
- 2 Welsh Assembly Government representatives
- 4 A4B Research Project Facilitators / scribes

7 university IP ideas were presented, 1 from Cardiff University, 1 from UWIC, and 5 from Glamorgan. More specifically:-

- IPA- Was telecommunications related to better wireless (broadband and other) connectivity, had a patent, was about to spinout, and was seeking up to £200,000 for demonstrating the system as a way of creating final-stage interest from companies.
- IPB- Was already spun out, and had GIS-related simulation software developed for the offshore marine niche markets in oil, gas and maritime safety. It was seeking ideas about other applications for the IP which could be developed.
- IPC- Was a very early stage idea related to improving telecommunications in a market likely to develop in 5-10 years time, through reconfiguring telecom nodes for greater flexibility, speed and quality, through the use of optics hardware development. Here there was a greater seeking of early-stage angel support which could potentially be used to assist in leveraging government money (through highlighting commercial potential of idea)

- IPD- Was actually a spin-in to a university in the medical instruments field, the innovation itself including an improved design to the implement itself, combined with monitoring software which allowed real-time data feedback to assist in the operation of the instrument and also record the activities for later review. In this case there had been significant assistance and mentoring given and the business plan had won second prize in a competition.

Whilst the main focus of the company was a pre-existing product that may require 3 years of trial before being allowed on the market, the diagnostic software were seen as an area where other applications might be developed.

- IPE- Was a piece of "parked" extensively patented IP (patented around the world including the USA) , developed to improve medical biotechnology testing, using integrated light emission and detection within an optical cavity to create simpler, cheaper and more integrated equipment. There had been a previous partner with the university, who had decided not to focus on this area, and thus the university representative presenting the idea was looking for other options of how to use the IP.
- IPF- Was a piece of IP not currently patented, with the likelihood of related manufacturing processes being patented as a precursor to likely spinout, in the area of battery technology. This was the result of a R&D collaboration with a local materials company where the company owned the patent on the material, but the university had expertise related to the use of this material in using it to create a lead-acid battery with significant reductions in weight, and size, easy bolt-on to increase voltage, and consequent multiple applications in electric vehicles, hybrid vehicles, and renewable energy storage. It also had advantages in terms of simpler manufacturing processes with increased automation, lower use of scarce resources (unlike alternative batteries) and lower carbon footprinting, with consequent likely advantages in terms of minimum efficient scale. What was being sought was both ideas for utilising the technology, but also funds for testing facilities, and potentially low volume production facilities, with up to £1m being seen as a viable amount.

- IPG- had already applied for 2 patents in the area of microbial fuel cells, the technology focused on generating energy from a wide range of bio-degradable substrates, with consequent uses in the the treatment of dirty water and other waste products, both creating renewable energy, and saving energy in cleaning processes. The concepts were at an early stage in commercialisation, however, with the finished concept being estimated to be 5 years from reality.

As can be seen, therefore, The 7 provided a full spectrum of ideas in terms of idea development and closeness to market, degree of pre-presentation assistance, and what they were seeking to obtain from the event and the business angels present. They also varied in terms of industry sector, whether they had already spun out of the university, were preparing to do so, or wanted to exploit IP in another way, had patents taken out, were seeking patents or wanted to protect their IP in other ways. Interestingly the academics involved also differed in terms of whether they were looking for funding, investment contacts, networking and one-to-one opportunities, ideas of how to exploit the IP, feedback on ideas, or someone to help share risk etc., these differences very much related to whether their I.P. was at the pre-proof of concept stage (blue skies), proof of concept stage, or ready for market stage

Following the completion of the presentations and a working lunch, the attendees at the event were placed into five groups, with each group containing a mix of the different groupings of persons at the event. A member of the project team was placed with each grouping in order to gain feedback regarding what the attendees wanted from the day, whether their objectives had been met and their views on future development of the concept.

Network manager feedback from the “event”

The limited Business Angel Network Manager attendance and time available to specifically discuss issues resulted in limited direct feedback from them. However, there was general agreement that the event had been worthwhile and that the piloted idea was one worthy of further development into a larger project (with future events focused more on specific industries, or technologies, and specific stages of the IP, and a consequent need for a more focused rigid structuring of presentation to the Business Angels to avoid confusion over what they were being asked to do).

Two key issues highlighted by the network managers were firstly, the exact role that business angel networks would perform in any project linking university generated IP and business angels. There was a concern that business angel networks could be seen as being bypassed in the project. This was discussed further and the need for business angel networks to be involved to effectively bring together business angels who may be interested in licensing university generated IP was strongly made. One network manager commented "our intellectual property is the knowledge of the individual business angels and their particular attributes and interests".

The second issue raised was the ownership of the IP, with network managers at the event being of the opinion that the business angels would want some kind of ownership of the IP in return for their investment / involvement.

There was also a general consensus that a more cohesive framework of engagement needed to be developed to get the ideas from the academics to the business angels, and that the mechanisms would need to be different depending on the stage of the IP (i.e. early, proof of concept, patent, spin-out etc.). The use of more focused industry / technology specific events and information and other "filtering" devices (such as Technology Transfer Officers, Business Angel network managers, etc.) were also seen as necessary. Some funders also stated that greater work on identifying the potential "flow" of IP from universities might be advisable (this potentially involving additional research into both actual and latent supply), as there had been little to date.

CONCLUSION AND FUTURE FRAMEWORK DEVELOPMENT

The involvement of Business Angels in university generated IP is likely to be a niche activity and requires identification and contact with such business angels who are likely to be interested in the licensing of university IP.

Any future programme needs to be developed through various business angel network managers. The support of BBAA is also important, given the general roles that they perform. Any future programme/initiative should therefore partner with a business angel network (s) so that the objectives of the programme and the business angel network can be recognised and achieved jointly, and to create clear added value for all parties.

An “opportunity pro-forma” that academics fill out to identify the initial IP opportunity should be developed in any future programme, which will serve the following purposes:

1. Record the opportunity for assessment by the host University.
2. Be an original source/scoping document that could be sent to interested Business Angels or other third parties.
3. Be the basis on which academics and the universities commercial services divisions create subsequent presentations for interested parties.

Various other interventions in the business angel market could also be considered simultaneously, for example the current “piggyback” scheme where Finance Wales can co-invest alongside Business Angels.

Generally, an earlier engagement in the process was seen as generating a greater long term potential benefit, by focusing the ideas at an earlier stage on the market, promoting relevant market research, marketing, and better presentation of the ideas, with events providing detailed feedback on each presentation. Because business angel involvement at different stages would require different engagement mechanisms, there was also consensus that a more detailed framework was required.

The use of bulletins (e.g. the Xenos bulletin) to publicise ideas (created using standard document templates that focus on USPs, market requirements, etc.) is another potentially related way of doing this at various stages was also Another possibility would be the use of “Angels / Entrepreneurs in Residence”, remunerated through status and specific remits to develop incubators, spinouts, and employment opportunities, both directly and through networking across faculties to provide the expertise (e.g. in business planning) often required by early stage university-created IP. Increased support for academics from technical counsellors and mentors is another option, to focus on bringing out the commercial aspects of early stage ideas and converting them into business propositions.

Understanding the motivations of business angels is therefore key, as is determining the right time for their involvement in a specific idea, relevant university and other stakeholder support structures. Viable communications and “matching” mechanisms

between the stakeholder groups is also both of importance and also in need of further investigation.

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