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**Baseline Survey of Commercialisation Staff & Skills in  
Major R&D Performing Institutions in Northern Ireland  
and the Republic of Ireland.**



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## **Abbreviations**

BRI	BioResearch Ireland
DARD	Department of Agriculture and Rural Development (Northern Ireland)
DCU	Dublin City University
FTE	Full Time Equivalent
HE	Higher Education
IP	Intellectual Property
IT	Institute of Technology
QUB	Queen's University, Belfast
R&D	Research and Development
TCD	Trinity College, Dublin
UCC	National University of Ireland, Cork
UU	University of Ulster

## 1. Introduction

Commercialisation can be defined as the process by which research outputs are converted to commercial usage or ownership. Ensuring an efficient process of commercialisation has a high relevance at the moment. In the Republic of Ireland there has been major national investment in R&D in universities, institutes of technology, and research institutions. In Northern Ireland, the already significant R&D budget has also been increased. A major rationale for this R&D investment is that the output will be of benefit to the economy. For instance in relation to one sector, ‘successful commercialisation of biotechnology research must be an integral component within the biotechnology and life sciences national strategy’, according to Enterprise Ireland’s policy document *Towards a Biotech-Ireland* (2002). This benefit can be realized in several possible ways:

- by providing a supply of skills and expertise to support priority economic sectors;
- by creating technologies of relevance to existing industry; and/or
- by creating technologies which will become the basis of new companies.

However, while investment in R&D performance and facilities will create technology, ensuring its commercialisation (i.e. its successful transfer to industry) requires a different set of skills and resources. A critical layer of such expertise are the staff who liaise between the research performers (particularly the HE sector) and technology users.

It is generally accepted that further investment is required in this expertise. This investment will take the form of additional staff resources, funding of patenting, and training and support services. The purpose of this baseline survey is to more precisely define the current status of commercialisation staff, skills, budget and other supports within relevant institutions across the island of Ireland.

This working paper was prepared for InterTradeIreland by Dr Jim Ryan and Mr Tony Forde of The Circa Group Europe Ltd. We wish to emphasise that this is a working paper designed to inform debate on crucial commercialization issues. The views expressed are those of the authors themselves and should not necessarily be construed as those of InterTradeIreland.

## 2. Methods

The major R&D performing institutions in the North and South, were first identified, followed by a process of establishing the appropriate staff members within each. Survey responses were accumulated from 31 respondents in 25 organisations and are reported in bulk; thus individual figures and comments for each institution are not published

**Table 1: Categories of institutions surveyed**

	Republic of Ireland	Northern Ireland	Total
Universities <sup>(1)</sup>	8	2	10
Institutes of Technology	12	1 <sup>(2)</sup>	13
Research Institutes	1	1	2
Total	21	4	25

(1) Including Royal College of Surgeons in Ireland (RCSI)

(2) BIFHE (See below) was surveyed but no data is presented as there are currently no staff

The organisations surveyed can be classified as:

- Universities/RCSI:** There are nine universities and the RCSI in the survey and all are major R&D performers in the Irish context. These institutions fill a unique role on the island in that they are almost the sole creators of new technology (apart from the Department of Agriculture and Rural Development (in Northern Ireland) and Teagasc) and are in receipt of a huge proportion of the national investment in R&D.
- Institutes of Technology:** In the Republic of Ireland these institutes provide a mix of vocational and degree courses, and are increasingly becoming involved in R&D. They are encouraged to do so through programmes offered by national funding agencies. The generally equivalent institutes in Northern Ireland – the Institutes of Further & Higher Education, do not conduct any significant level of R&D. Belfast Institute of Further and Higher Education plan to appoint a Research Manager shortly to develop external R&D liaison. However, they do not currently have staff involved in commercialisation activities as defined in this survey and thus are not computed in the staff figures below.
- Research Institutes:** The only significant institutes covered were DARD (previously Department of Agriculture of Northern Ireland) and Teagasc. DARD have a formal agreement with Queen’s University, Belfast, (QUB) which provides

that the Intellectual Property (IP) management function is fulfilled by QUB staff. This is part of a formal policy position by DARD on IP exploitation. Teagasc does not have central staff dealing with IP issues. Individual research centres deal with IP as it arises.

### 3. Results

The survey showed a very large range of approaches to the execution of the commercialisation role. As might be expected, those organisations which perform more R&D will have greater IP activity, and therefore have a greater infrastructure. Therefore universities are generally more organised than ITs, and the bigger institutions are generally more organised than the larger ones. This, however, is a generalisation rather than a rule.

The surveyed organisations also differ widely in their approach to performing the commercialisation function. These variations are noted in the following sections. It was also clear from the survey that the situation in many colleges is changing and that many organisations are reviewing their needs in this area and some are developing new policies. Planning or construction of incubators was also a significant element of college development policy in many responding organisations.

#### **Number of Staff involved in Commercialisation:<sup>1</sup>**

3.1 While many organisations have several individuals with some role in this area, only six have more than one FTE (Full-time Equivalent) dedicated to the role. The organisations which have clearly identified the role as being important have created a specific position(s). However, the existence of a specific position solely to deal with IP management was exceptional. In many of the ITs it was clear that generation of IP was still regarded as very minimal and the management of IP was therefore understandably a low priority. No attempt was made in this study to establish the actual level of current or historic IP generation.

**Table 2: Aggregate figures of staff involved in commercialization**

	Nos. of Institutions Surveyed	Number of Staff	Full-Time Equivalents
Northern Ireland	4	8	5.7
Republic of Ireland	21	54	16.21

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<sup>1</sup> The number of commercialization staff is defined as those involved in Intellectual Property Management, patenting and licensing. It did not include management of specific R&D projects for industry, nor liaison with industry for the purpose of promoting research or training services.

The survey showed that 62 people are regarded as being involved in commercialisation activities within the institutions. However, this represented less than 22 full-time equivalents of staff. Note that this is based on estimates of time allocation provided by the staff concerned. In most cases the commercialisation role is one aspect of their wider role within the college.

In the ITs the formal responsibility for the commercialisation function lies with the Head of Development. However, the day-to-day role is almost always performed by an External Services Manager or Industrial Liaison Manager. As might be expected from the diversity of this role, a small proportion of such a manager's time was spent on the commercialisation function. The other roles fulfilled by the surveyed staff is discussed in Section 3.3.

Only six organisations had a specific staff position created to fulfill the function of IP management. This is not an unexpected result given that the hitherto low funding regime has not resulted in a large output of IP, and there was therefore no major requirement for IP management.

Also of note in regard to commercialisation staff is the role of the PATs (Programmes in Advanced Technologies) which are part of Enterprise Ireland. Several of these PATs (particularly BioResearch Ireland and AMT Ireland) provide assistance to college researchers in technology commercialisation and are *de-facto* part of the college infrastructure for commercialisation. Several colleges (TCD, DCU and UCC) noted the use of BRI support in commercialisation. BRI have at least one staff member in five colleges, plus a full-time Patents & Licensing Manager. However, for the purposes of this study only college employees have been taken into account.

In the Republic of Ireland, the universities and IT colleges are all engaged in R&D and in providing services to industry. These institutions act independently with respect to the 'commercialisation' process, although some collaboration does take place on research. In Northern Ireland, the major R&D performers are the two universities, QUB and the University of Ulster. DARD in Northern Ireland, which is also a major R&D performer, is associated with QUB and appears to use their resources for IP management. The University of Ulster has set up a company, UUTech Ltd, which helps bring together R&D activities which are deemed suitable for further commercial development. Similar to UUTech Ltd is QUBIS, the commercialisation arm of Queen's University, Belfast.

Several respondents also noted that there may be an advantage in developing a central unit for advice and collaboration on the 'commercialisation' process. It is important to



note, however, that these were volunteered comments and this possibility was not explored with all respondents.

## **Qualifications & Experience of Staff:**

3.2 All of the staff involved in the commercialisation role are graduates, with Science (53%) as the major qualification of the staff member performing the commercialisation role; 35% are business graduates; 9% are engineers and 3% from an architecture background.

While some of the respondents had worked previously in industry, the majority had no formal background or training in technology transfer or commercialisation. The survey attempted to roughly measure of the level of professional activity in the area by asking about membership of professional organisations in the area. In the universities, many of respondents were members of AURIL<sup>2</sup> and were aware of other technology management organization, e.g. LES<sup>3</sup> and AUTM<sup>4</sup>. However, formal involvement in these organisations was exceptional.

Most of the IT colleges are members of Tecnet, a unit formed by the Council of IT Directors, to provide information on R&D activities and service to industry.

## **Other Duties Performed by ‘Commercialisation’ Staff**

3.3 As noted above, few of the staff performing the commercialisation role are solely occupied with this task. The other duties performed are various, but several general trends can be determined. The role is generally attached to either the college research management role (occasionally within a specific faculty); or to the college development or external liaison function (see also section 3.4). The other duties performed by ‘commercialisation’ staff tend therefore to be one or more of the following:

- Management of College R&D affairs (particularly industrial R&D contracts);
- General College Developmental roles (building projects, policy development, etc.);
- Involvement in managing industry-funded R&D projects; and
- IT staff often have some educational role.

<sup>2</sup> Association for University Research and Industry Links (see: <http://www.auril.org.uk>)

<sup>3</sup> Licensing Executive Society: (see <http://www.lesi.org/>)

<sup>4</sup> Association of University Technology Managers (see: [http://www.autm.net/index\\_ie.html](http://www.autm.net/index_ie.html))

## Budget for Commercialisation

3.4 Only two organisations (Enterprise Ireland and Shannon Development) have a specific separate budget for patent costs. Accordingly, it was not possible to determine an overall budget for this activity. The general absence of a specific patent budget should not necessarily be interpreted as a lack of funding for this activity. Most organisations noted that their historic level of patenting had been low, and therefore the need for a separate budget had not been apparent. These organisations reacted to patent opportunities as they arose, and none reported any organisational opposition to funding patents. However, some reported that the procedure for budget request was slow and this resulted in a lesser ability to react rapidly to opportunities. No organisation reported that it was not possible to obtain funding.

Several institutions also noted that their primary mechanism for patent budgeting would be to seek funding from Enterprise Ireland or Shannon Development.

An important aspect of the commercialisation role is the organisational location of the activity. This is directly relevant to budget availability. In some organisations the position reports to the External Liaison or Development office; while in others it is associated with faculty or general Research Management activities.

- A reporting role with **External Liaison** (or equivalent) had the advantage that the budget was generally available and was associated with less bureaucracy. However, the negative aspect was that the office had less contact with the researchers in the organisation, and was dependent on their voluntary cooperation.
- A reporting role with the **Research Management** office had the advantage of close liaison with researchers, and the ability to build IP considerations into the normal R&D management infrastructure. However, patenting and related budgets were perceived as being in competition with research funding. This funding was often harder to win, and also involved a more cumbersome approval process.

Another budget consideration was funding for professional assessment and marketing of technology. Understandably, this was a concern of the more organised offices, which had experience of the practicalities of commercialisation and realised the need. The activities to be funded in this category included:

- Consultancy advice and studies on IP and products; and

- Patent litigation and strategy advice.

The more experienced respondents consistently emphasised the need to fund studies to define the efficacy, market relevance and value, and other aspects of technologies or products developed within the colleges. These studies are necessary to convince potential licensees of the relevance of IP, and/or to establish its potential for a start-up company.

## **Patenting and other Support Services**

3.5 All but three institutions had used patent agents at some stage, but seven of the respondents used a single patent agent for all purposes. Once again, this must be seen in the light of a low overall need for patent agent services. Most of the universities, and a minority of other institutions, used several patent agents. The survey questioned respondents about the basis on which the choice of patent agent was made. Patent Agents are chosen for several reasons:

*Expertise:* They were usually chosen for their particular expertise (software, mechanical engineering, biotech, etc.).

*Researcher's Preference:* In many cases a researcher would initiate the contact with a particular patent agent, and this relationship would be continued by the relevant college authorities.

*Partner's Preference:* Another factor in the choice of patent agents was the preference of an industry partner in the research which led to the patent. In several cases it was apparent that the industry partner had specified the patent agent to be used.

*Regional factors:* Northern Ireland universities used Murgatroyds (which has a Belfast office) or UK patent agents; institutions in the Republic of Ireland tended to use one of the Dublin-based agents.

## **Specialist Support Services:**

3.6 An active patenting office would expect to need specialist legal or technical expertise to support its work at some stage. This would include advising on license agreements, patent litigation, etc. Most institutions had not had need of such services. Those in need of legal advice had tended to use local solicitors, or in-house legal counsel. Among the universities there had been a minor use of consultants for assessment of markets for technology, and for promotion of specific IP. One interviewee noted that they had been in a position where the college 'had patented something, but couldn't afford to market it' because there was no budget to do the preparatory work.

It was clear from most discussions that the need for such specialist supports had not been tested within the institutions. This need will only arise when their level of patenting and licensing increases. Other sources of advice mentioned by ITs included the Council of IT Directors, and TecNet.

### **Barriers to Commercialisation:**

3.7 The final point of the survey explored the perceived barriers to the establishment of an appropriate infrastructure for IP management within the particular organisation. For this purpose four issues of relevance were proposed, and interviewees were also encouraged to suggest other factors of relevance. The four potential obstacles were:

- Funding for patents and associated activities;
- Availability of staff with expertise in IP management;
- Awareness of institutional researchers of IP; and
- Commitment of the institution.

There was quite a diversity of view as to which of these factors was most significant.

The overall view was that the **commitment of the institution** was the most significant perceived 'Barrier' to the development or improvement of the commercialisation process. Of the 22 educational institutions surveyed 11 rated this as the 'number one' issue. This rating is unsurprising given that two of the other factors are directly related to it. Institutions with a commitment to the process of commercialisation would be expected to provide a budget for the activity, and also to ensure that their research staff are made fully aware of the issues surrounding IP protection and commercialisation. Some respondents qualified their response by stating that institutional commitment was not a 'barrier'. However, they felt that the institution could do more to develop an internal environment which supported the concept that researchers had a duty to properly manage their IP. Others stated that funding, while available, was not adequate for proper execution of the function.

The second most important perceived barrier was the availability of a **budget** for the activity. It should be noted that the views expressed were made by staff whose institutional IP infrastructures are at many different stages in their development. Those whose infrastructure was weak tended to seek further funding for the basic industrial liaison role. Those with a more sophisticated function noted the need for funding for more specialist supports (see section 3.6). As noted above, the inadequacy of funding was

clearly attributed by many respondents to the perceived lack of commitment of their institutions to the importance of IP.

Some respondents noted that their colleges regarded the commercialisation role as an activity which should be self-financing on the basis that it had the potential to generate income. Respondents reported a lack of understanding of the need for investment to generate this income. Some IT respondents noted that their colleges would claim that the college budget was only for education, and that research (and associated activities) should be externally funded. In short, many IT respondents felt that their institution's view was that production of commercial technology was not seen as an appropriate objective for their college.

Nevertheless, there was also a widespread perception that a change in institutional attitudes was occurring, and that this was associated with the increasing government emphasis on economic development through R&D, and the increase in R&D funding.

The **awareness of research staff** to the process of IP protection and commercialisation is obviously critical to the success of the IP function. Researchers are the originators of IP. If they chose not to report its existence, and/or to ignore processes for its protection, there is little that commercialisation staff can do. The survey suggests that the awareness amongst research staff varies both within and among institutions. Those involved in applied R&D tend to be more aware than those in basic R&D, and those in universities are generally more aware than those in ITs (see below).

Several respondents noted the importance of close contact between commercialisation staff and researchers. This allows the commercialisation staff to be aware of potential IP and advise researchers as it develops. Creating an awareness of IP within research staff is of prime concern to commercialisation staff. Nevertheless, this factor was regarded as a lesser issue in the establishment of an IP management infrastructure. Only 3 organisations regarded it as the most significant barrier.

Although researcher awareness was not generally considered a barrier, respondents reported a huge ignorance of the realities of IP protection among researchers. Many pointed to the need to inform the research community, and to 'demystify' the IP process. According to one respondent 'with a few exceptions, academics are not interested in commercialisation'. It was therefore regarded as important that the process of IP protection, within the college, be seen as relatively simple and not as a burden to the researcher in the execution of his primary research role. In this respect, it was emphasized that clear institutional guidance would be useful. If the college commercialisation staff could refer to a college policy which determined staff obligations re IP, it would improve

their ability to perform their role. While some institutions have obligations re IP in their staff employment contracts, it is only implemented and/or emphasized in a very few colleges.

Distribution of a proportion of the income earned on IP licensing is also a useful incentive, which is already in place in all of the universities, but not in many ITs, nor in Teagasc. In general, IT respondents reported this as a difficulty in motivating their researchers. IT staff are not formally employed as researchers and have a heavier teaching load. Neither do they share in income earned from IP. Thus they have less time to conduct research, and less motivation to do it. However a working group has been established by the Council of IT Directors to investigate IP policy.

The **availability of qualified staff** with appropriate expertise to perform the function of commercialisation was not generally regard as a barrier. However the institutions with a greater commitment to staffing in this area did report difficulties in hiring appropriate staff.<sup>5</sup> It was also clear that many institutions had never sought staff who were specifically qualified for this role. Staff with technology management or licensing experience in industry, or in major R&D performers overseas, can be ideal candidates. Those who had advertised for such staff reported that they were hard to find, and also that it was hard to attract these staff on university or IT pay scales. One institution reported that a recent advertisement had attracted only one candidate with practical experience of IP.

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<sup>5</sup> Several ITs did note that they have not been in the market for trained staff for this function and were there not able to comment on their availability.

## 4. Discussion

Overall the survey suggests that the commercialisation function across the island is seriously under-resourced in relation to the current investment in R&D, and the expectation of technology generation. The total staff resource on the island is less than 22 FTEs. This level of staffing can be found within a single R&D institution in other technologically developed countries. On the other hand, the existing resource is not unexpected given the historically low R&D spend. It is equally clear that the situation is changing and that many of the surveyed institutions are actively involved in reviewing and expanding their resource base.

Issues which arose in the survey discussions include:

4.1 The level of experience and expertise of many of those performing the IP management roles is poor. Many of the executives in the role have only R&D experience. The availability of staff with appropriate expertise (where such expertise had been sought) was also low. In the ITs this is unsurprising as this is one function falls within a much broader role. However, even within Universities the number of staff with relevant experience (other than that achieved from performance of their current role) is low.

4.2 Many of the institutions have only little experience, or even awareness, of the range of support services that would be required to adequately fulfill a commercialisation function. These supports include specialist patent agents, legal supports for licensing and litigation, and consultancy supports for technology evaluation and marketing. Those respondents who were aware of these needs reported a lack of funding for this aspect of their activities.

4.3 The perceived barriers to improvement of the situation highlighted the need for the individual institutions to make a clearer policy commitment to the importance of the commercialisation function. Such a commitment would have several benefits:

- It would signal to research staff that IP management was a duty and would thereby assist commercialisation staff to gain cooperation; and
- It should ensure adequate resources for the commercialisation role.

4.4 Further efforts are required to educate researchers of the importance of IP, and of their role in the processes which will lead to successful commercialisation. There are many models for such activities, and most institutions seem willing to facilitate initiatives which will inform their researchers.

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