O'Herlihy & Co. Ltd

Evaluation of the
Technology Translator Project

Final report

25 November 2005

O'Herlihy & Co. Ltd

20-23 Woodside Place

Glasgow

G3 7QF

T +44 (0)870 2000 654

F +44 (0)870 1300 125

Email : info@oherlihy.com

Contents Page

O'Herlihy & Co. Ltd.

Evaluation of the Technology Translator Project
Executive Summary

Introduction

1.1 Previous studies by SE and partners had concluded that meaningful interaction between SMEs and academia required dedicated people to facilitate face-to-face contact between the two groups.

1.2 The Technology Translator (TT) project in digital communications began as a pilot project in 2003. It was then funded for May 2004 to May 2006 with £194k. Accordingly, a single Technology Translator was employed and is managed by the Electronics Design Centre at Napier University.

1.3 This report presents the findings of an evaluation of the project in July 2005. The study aimed to examine the operation, management and appropriateness of the project, compare it with best practice, assess actual and potential outputs and impacts and consider if and how the project should be expanded. A detailed analysis of economic impact was not required.

1.4 The project was intended to help firms to find partners for technology research and development and then to have a successful collaboration. It is achieving this objective.

SE Network and SDI perceptions

1.5 There was strong support by those consulted within the Scottish Enterprise Network for the TT project and for the person in the role.

1.6 The rationale for providing support was thought to be well-founded and the project thought to fit well with other initiatives.

1.7 The TT project is well known to the SDI staff, especially the Communications/MOET trade and investment teams. SDI considers that the TT project is a value-added service in telecommunications and related projects.

1.8 SDI consultees considered that the TT project was sound and is one that should continue in the future. Indeed, there was a view that it could be expanded to cover other sectors or industries.

1.9 There was a strong view that the Technology Translator should be someone who has a good understanding of the technologies being targeted and should not be a "generalist" advisor.

1.10 Usually the Technology Translator worked well with the SE Account Managers and with other initiatives such as Technology Transfer in Optoelectronics and Microelectronics (TTOM).

1.11 When comparing the various technology transfer initiatives familiar to those consulted, the list from SE was very different from that of the firms and universities, suggesting that knowledge and priorities are different.

Participant interviews

1.12 A total of seven interviews with six participating firms and 11 interviews with representatives of university departments and commercialisation offices were undertaken in order to identify the benefits they had derived through the Technology Translator's input. The Technology Translator put forward the firms and academics for interview and only those selected by him were to be contacted.

1.13 Participating firms and academics rated the Technology Translator's input very highly and considered that his knowledge and tenacity were of significant value and were instrumental in creating and maintaining the relationship between the partners. They also felt that Technology Translator's extensive technical and commercial knowledge was fundamental to a project's subsequent success as was the Technology Translator's knowledge of government support initiatives.

1.14 Firms commented that the Technology Translator "spoke their language" and "understood fundamentally how technology contributes to the firms' business success". This was considered unusual in a person effectively representing government agencies in Scotland.

1.15 Firms and academics also highly rated his tenacity, networking skills and understanding of the research base in Scotland.

1.16 The Universities' Commercialisation/Industrial Liaison officers were uneasy about the Technology Translator's direct contact with academics and the opportunity for them to work directly with firms, potentially bypassing the University's in-house advice.

1.17   There are a number of initiatives that both academia and industry would like investigated for further development, namely CASE studentships, a Ph.D. seminar and Technical support/development for CTOs.

1.18   Firms felt that there was scope to facilitate firm-to-firm contact and that this would be very useful for them. In fact, this is already happening.

Culture change

1.19   Overall, academics reported that their trust of the firms was increased during the project, that they had gained a better understanding of the commercial pressures and realised that collaborations were a valid way of promulgating their knowledge. However, the ownership of intellectual property (IP) was still an issue.

1.20   The academics considered that their commercial partner was more willing to engage and had a better understanding of academic pressure. However, they held the view that SMEs wanted quick answers to narrow problems which wasn't how the academics worked best.

1.21   Firms reported an increase in their respect and trust of the academic partner and improved their own willingness to engage in other projects. IP ownership was still an issue however.

1.22   The firms considered that the academic partner had gained an understanding of commercial pressures and while they had seen the projects as a commercial opportunity rather than an interesting academic exercise they were nonetheless able to publish papers. However, firms held the view that academics did not fully understand SMEs and that the commercialisation offices could get in the way.

1.23   If all the projects are like the ones examined, the cultural impact is likely to be low as the participating firms had long-established contacts and experience of collaborations. Likewise, the academics involved had worked with the commercial sector before.

Economic impact

1.24   There was no evidence of financial economic impact so far and while we do not consider this an issue so early in the project, to aid robust economic evaluation in the future we recommend that appropriate evidence is captured each time it appears.

O'Herlihy & Co. Ltd.

1.25   The projects examined would have taken place anyway on much the same scale and timing and to the same quality, for instance by using internal staff who were just as capable as the academic. Accordingly the *financial* benefit to the firms that will be able to be credited to the TT project will be very much reduced.

1.26   We believe that financial additionality is likely to be highest when a small firm is involved rather than a large company, when neither partner has worked with the other sector before and when the collaboration is firm/academic rather than firm/firm. More collaboration like this would show better net economic impact credited to the TT project.

1.27   The additionality is higher when defined not in financial terms but in whether collaboration would have occurred or not. However, some of the firms had participated in multiple projects and here the 'collaboration additionality' is likely to be low.

1.28   Non-financial benefits include finding expertise firms did not know existed, developing a firm's network of contacts, being able to put consortia together quickly (for instance to apply for funding) and understanding the available public support.

The TT landscape

1.29   There are a number of programmes and initiatives that directly and indirectly relate to the TT project. They range from web based information sources through funding programmes such as SEEKIT to staffed resources such as Technology Transfer in Optoelectronics and Microelectronics (TTOM) and the Innovation Relay Centre (IRC). None directly conflict with the TT project and indeed are complementary to it and provide sources of support for the collaborations.

Benchmarking

1.30   The aims and performance of the TT project were compared to UK and international initiatives.

1.31   In the UK, Faraday partnerships have a similar goal to improve the competitiveness of UK industry through more effective interaction between the science and technology base and industry. They are the source of the Technology Translator concept but differ in that there are many commercial and academic participants in each project.

1.32   The London Technology Network has a similar role to the TT project but covers a wider range of technologies.

O'Herlihy & Co. Ltd.

1.33   The East Midlands has over 30 initiatives providing technology transfer support. There are three elements in their strategy – locating the technology, brokering it between provider and recipient and funding the transfer. The East Midlands Development Agency has at the core of its implementation of support long-lasting partnerships between firms and HEIs based on Faraday Partnerships.

1.34   Qi3 is a private sector organisation based in Cambridge which offers a TT service based on trust and respect, exactly the two aspects deemed to important to TT project participants.

1.35   In Europe, the TEURPIN model is based on facilitating commercially-driven projects between technology 'providers' and technology 'adopters'. Its six stages run from scanning for opportunities to making sales. In comparison, the TT project focuses on the first stages, essentially stopping when the partners have met and agreed to collaborate.

1.36   The SPRINT experience is relevant too as it shows that even the most commercially-active practitioners achieve no more than one or two signed deals for every hundred leads.

1.37   The UK and Ireland IRCs are 2-3 times better than IRCs in other countries at converting contact with firms into a signed agreement but even so it takes around 30 company contacts to get a negotiation started between any two and it takes 1-2 years to do it. While not directly comparable to the TT project these findings do provide an indication of the typical timescale involved and indicate that technology translation is a time consuming process.

Operation and Management

1.38   Based upon our interviews a Technology Translator is an individual who is a technical expert, has sound commercial experience and can express the firm's need succinctly. The individual constantly develops their network and facilitates deals between firms and University departments where these deals rely on trust. The Technology Translator gives firms an alternative view of available local technical expertise. Many of the companies thought they knew everyone who was active in the marketplace yet often found new and relevant academic specialists who could address their specific technical problems.

1.39   The key to success is the Technology Translator's credibility with both commercial and academic parties. This comes from a blend of technical knowledge, commercial experience and interpersonal skills.

1.40   The current management by the EDC provides 'contractual cleanliness' for SE (the Technology Translator is not on SE's payroll), differentiates the Technology Translator from SE, emphasises his uniqueness/independence and provides very limited specialist/technical support. Given that there is currently just one Technology Translator who operates relatively independently we feel that EDC provide little added value and that if the Technology Translator was to report directly to SEEL the administrative burden would be low.

1.41   There are few projects in the pipeline involving small companies. This is partly due to the risk of the project failing. The impact of this happening can be reduced by providing financial support to the participants. Support could come from other initiatives or from a budget set up for the Technology Translator.

Expanding the project

1.42   The review has confirmed the need for the contribution made by Technology Translators. There is a clearly-held view among those consulted in firms and universities that the translator is valuable and can support other initiatives being promoted by the Network.

1.43   When deciding on new areas for Technology Translators there are two criteria that should be judged: the priority given to a Cluster/Industry and whether the competitiveness of SMEs in the Cluster/Industry will improve as a result of research input from a university.

1.44   For example in the Food and Drink cluster, we know from earlier research that university links are weak and that Scotland's SMEs do not perceive value to be gained from such contacts. On the other hand in areas such as life science, medical devices and bioscience, Scotland's SMEs need constant research input in order to remain competitive but often do not have the breadth of contacts or the trust to engage universities. We see Technology Translators having a strong contribution to make to this latter group.

1.45   Technology Translators can be independent operators, but they need close links with other Network departments specifically relevant cluster teams, in some cases SDI (an important user of the first Technology Translator) and LECs where they lead on a given technology.

1.46   While it would appropriate for up to three Technology Translators to be managed directly by SEEL if the number of Technology Translators is increased to four or more there is a case for a dedicated management resource. This could be delivered either directly by SEEL or through a contract with a third party organisation.

O'Herlihy & Co. Ltd.

1.47 Whatever the reporting and management lines, the Technology Translators could, in order of desirability, be a) self-employed, b) employed by a third party or c) employed by SE.

Conclusions

1.48 The overall objective of the TT project is to facilitate joint working between academia and SMEs. Our interviews and consultations indicate clearly that it is achieving this objective. If we take facilitating *collaborative research and development* as the overarching objective of the Programme, its additionality would appear to be high suggesting that future impacts are also likely to be high.

1.49 The TT project has been influential in encouraging partners to work together principally through addressing the 'information market failure' that was characterized by firms being unaware of the expertise available in academia prior to the Technology Translator becoming involved. This indicates that the original rationale was sound.

1.50 Overall, the TT project was considered by those consulted to be unique, not to overlap with existing initiatives and was also considered to be adding value.

1.51 Good progress has been made on establishing collaborative projects but, based on our sample, there have been no products or processes developed or licenses granted to date as a result of the initiative.

1.52 We understand that SEEL now places greater emphasis on the volume of collaborations between academia and firms. However, the decision to fund the original board paper was made on the understanding that other targets such as license deals and product launches would be met. It would be appropriate to review these targets and consider how they might be measured and tracked for the remainder of the TT project.

1.53 The target number of collaborations was 20 and we believe that 15 would be more appropriate.

1.54 We suspect that as the TT project approaches its full term, SEEL's Management Team/Board will seek assurance that there is an associated *economic impact* and should this be the case, interim impact measures will be required.

1.55 Even given the strong progress to date of six active collaborations, we believe there needs to be more in pipeline; each project takes a long time and a lot of nurturing to come to fruition and there is a high risk of fall-out.

O'Herlihy & Co. Ltd.

Main recommendations

Current TT project

1.56   Maintain the current double focus on digital communications technology applied in digital technology companies.

1.57   Stimulate involvement of firms and academics *new* to collaborative research by actively marketing to them.

1.58   Reduce the target for agreed collaborations to 15.

1.59   Firm to firm contact is a potential strength of the TT project and we recommend that these are encouraged by the project's managers by specifically allotting time and targets to the activity.

1.60   Increase communication to and involvement with the TTOM initiative. Agree the ground rules with TTOM for referring a firm including suitability criteria, the level of certainty the Technology Translator can offer to the firm and who handles the application.

1.61   Be clear when explaining that the objective of the TT Project is to facilitate collaborative projects between universities and firms as opposed to achieve widespread cultural change through collaboration.

1.62   Ask each Account Manager in writing for the level of information that they require.

1.63   Track project outcomes to prepare for the final project evaluation which will be required to report on all three target areas proposed in the original Board Paper.

1.64   Be prepared to measure economic impact.

An extended TT project

1.65   Given that SEEL is providing the finance, focus new areas on either university research strengths or clusters of firms that are represented in the SEEL area.

1.66   Maintain the double focus of a technology applied in a technology firm.

1.67   Affiliate new Technology Translators to the department most relevant to their specialism. This is similar to the model that works well for IRC Scotland.

1.68   Use the AURIL model as the basis of the competence assessment of future Technology Translators.

1.69   Consider introducing feasibility grants for *new* firms and academics to reduce the perceived risk of the project.

General recommendations

1.70   If SE take the view that the Universities' Commercialisation/Industrial Liaison officers do not 'add value', this should be tackled at a senior level and not be left to individual initiatives to muddle through.

Chapter 1

Introduction

1.71   Scottish Enterprise Edinburgh and Lothian (SEEL) appointed O'Herlihy and Co. Ltd. to undertake an evaluation of the SEEL Technology Translator (TT) project in July 2005. The study aimed to examine the operation of the programme and its performance against objectives, assessing actual and potential outputs and impacts.

1.72   The study team comprised of Donal O'Herlihy, Graeme Boyle and Tim Blaxter. They were each involved in meeting with the programme management and managers, the participant companies and stakeholder consultees from government, industry and academia. In addition Graeme Boyle undertook secondary research into national and international benchmark initiatives.

1.73   The original board paper indicates that the programme was intended to help firms to find partners and then to have a successful collaboration. It is achieving this objective.

The Project

1.74   The TT project built upon an earlier application for DTI Faraday funding involving the universities of Strathclyde, Edinburgh, Stirling and Lancaster that was unsuccessful. A submission was made to Scottish Enterprise to support the project and following a review it was agreed by SEEL that support would be provided for a one year pilot with the possibility of a full scale project lasting two years. The TT project began as a pilot in 2003 and was extended to May 2006.

1.75   The project's objectives state that *'…the overall aim of the project is to deliver industrial benefit and encourage excellence in relevant applied research. **It is clear that the industrial and academic bases are both client groups of this project.'*** This distinguishes the programme for other initiatives that are primarily academic based (Proof of Concept) or company based (SMART).

1.76   The objectives of the evaluation of the TT project research were:

- ➲   *Determine the cultural impact of the programme.*

- ➲   *Determine the appropriateness of the programme.*

- ➲   *Provide a comparison with best practice.*

- ➲   *Identify how to extend the programme.*

1

➲ *Identify how to link to other initiatives.*

➲ *Review and comment on the monitoring and management measures.*

During the inception meeting it was stated that it was not necessary to undertake a formal economic impact review and produce detailed figures for gross and net impact or Gross Value Added (GVA). We intended to include a summary commentary of economic impact for completeness but would note that for nearly all of the projects, it is too early to quantify likely benefit. For this reason we have made suggestions on how impacts might be identified and tracked over the course of the remainder of the project.

1.77   The methodology adopted for the evaluation was based on semi-structured consultations and interviews with stakeholders, participants and those knowledgeable about technology transfer and the TT project. Following our inception meeting with the client, we held the detailed interview with the Technology Translator (David Jack), covering :

➲ *The background to the initiative.*

➲ *Participation (by project type and geography).*

➲ *Engagement of firms and their respective profiles.*

➲ *Contact details of interviewees.*

➲ *Issues of sensitivity.*

1.78   Subsequent chapters give details of the interviews and consultations.

Report Structure

1.79   The next chapter presents a summary of the project's implementation to date and is followed by a summary of the feedback from consultees in the Enterprise Network and its partner organisations.   In chapter three we present feedback from the firms and university participants. We also included a section summarising the benefits deriving to participants and make comment on likely future impact. Chapter four provides a benchmarking assessment. We conclude the report with two chapters, one appraising the operation and management of the TT project and the final chapter which presents our Conclusions and Recommendations.

O'Herlihy & Co. Ltd.

Chapter 2

Consultations

2.1   The Technology Translator Project

2.2   The original concept of the Technology Translator was derived from an unsuccessful bid to the DTI for Faraday funding. The Technology Translator role is one that has been promoted by Faraday over recent years.

2.3   Following this unsuccessful submission, the university consortium presented the proposal to Scottish Enterprise Edinburgh and Lothian seeking support. The proposal was funded on a pilot basis in June 2003 for a period of one year and engaged Strathclyde, Edinburgh and Stirling universities in addition to 12 locally based firms. During this pilot phase, Aberdeen and Heriot Watt Universities in addition to the Scottish Crop Research Institute and the Intermediate Technology Institute were engaged.

2.4   In May 2004, the project was put forward for Gate 3 approval. Funding would amount to £194,000 and covered a two-year period. This funding was designed to pay for the employment of a single Technology Translator and also to cover the management which was subcontracted to the Electronics Design Centre at Napier University.

Objectives

2.5   The project was designed to address barriers that prevent successful collaborations between universities and industry. It built upon previous research work[1] that had been undertaken by Scottish Enterprise and its partners. These studies concluded that meaningful interaction between business and academia required dedicated people to facilitate the links between the two groups. It was considered essential to engage SMEs in face-to-face contact with academia if these links were to be established on a sustainable basis.

---

[1] SHEFC/SEN report on "Research and Knowledge Transfer in Scotland (2002)"; Technology Scotland - "Bridging the Gap (the interaction of SMEs and academia) - March 2003

O'Herlihy & Co. Ltd.

2.6   Three sets of targets were proposed against which the performance of the Technology Translator would be assessed:

- ➲   *Number of collaborative projects – 20.*

- ➲   *Number of products/processes developed – 8.*

- ➲   *Number of licenses granted – 8.*

2.7   It was anticipated that these targets would be achieved through facilitating collaboration between researchers in academia and firms.

SE Network perceptions

2.8   Broadly speaking, there was strong support across those consulted within the Scottish Enterprise Network for the TT project and specifically for David Jack. It was recognised that there are other initiatives in place that support technology and information transfer and these were felt to be complementary to David's role. In effect, it might be stated that the Network is looking to improve information and knowledge transfer between universities and firms and is embarking upon several initiatives to address this issue - Technology Translation is one of these initiatives.

2.9   The rationale for providing support in this area is felt to be well founded. There is a strongly held view that the lack of contact and engagement of university research personnel by SMEs in Scotland is one of the key criteria that holds back its investment in Research and Development. As increasing business expenditure on Research and Development is one of the Scottish Enterprise Network's thrusts, the Technology Translation programme is seen to have a sound rationale.

2.10   There was a view expressed that SMEs do not understand what universities can offer nor do they understand how best to engage them. Separately, there was also a feeling that SMEs typically have a specific issue that they need to have addressed quickly - that is, they are looking for a "golden bullet" which is not usually where a university can make a strong contribution. Firms underestimate the benefit that can be gained from engaging a university over the medium term on technical development issues.

2.11   Those consulted recognised clearly that David Jack is knowledgeable in several different areas namely:

O'Herlihy & Co. Ltd.

- ➲ *Specific technologies.*

- ➲ *Industry trends.*

- ➲ *Key players (both academic and commercial) in the local marketplace.*

2.12 The Technology Translator was seen to provide technical business development support that complemented the commercial/financial support delivered by the Network's Account/Client Managers. He was also regarded as an excellent networker.

Interfacing

2.13 While nearly all of the commentary was positive, there was one note of caution. This stemmed from a specific case where the firm's Account Manager learned retrospectively of the TT's input to the firm. Following discussions between the TT and the firm, the firm identified a course of action it wished to follow and drew up a specification for this activity that was presented to the Account Manager.

2.14 This was the first that the Manager had heard of the TT project and while being positive of the role that the Technology Translator was playing, he was uncomfortable that the firm had been approached by a Network supported advisor without having been briefed first. In his view, this "set hares running" and he considered that it took some time to get the project back under control. We should point out the firm in question was particularly happy with the Technology Translator's input and that the Technology Translator had in the past provided detailed contact information to the Account Manager and had been asked to reduce the amount.

> We recommend that the Account Manager for each firm is asked in writing for the level of information that they require.

Other initiatives in this area

2.15 When undertaking our consultations we endeavoured to identify other initiatives that were being supported either by Scottish Enterprise or its partner organisations in the area of Technology Transfer or Technology Translation. We present a summary of those mentioned by the consultees in table 2.1 below.

2.16 The area of closest overlap was with the Technology Transfer in Optoelectronics and Microelectronics (TTOM). The Network's Micro and Opto Electronics Team (MOET) presented a proposal to the Scottish Executive for SEEKIT funding in 2004. Its focus is to exploit the strengths of Scotland's academic institutions and to broker links between

O'Herlihy & Co. Ltd.

these institutions and firms. A total of £500,000 was provided equally from the Scottish Executive, SE Cluster Team and Europe. Delivery of the Programme was contracted to the Scottish Optoelectronics Association as it had previous experience of running workshop initiatives of this kind for SE. The TTOM funding covers:

➲ *Event costs.*

➲ *25 feasibility studies of £5k each (total £125k).*

➲ *A pot to cover 'General Support' for firms who want to go beyond the workshops but who need a bit of extra assistance - it can also help firm to firm agreements.*

Activity

2.17 The TTOM delivery thus far comprises two types of activity

➲ **Market Seminars** *– these bring a wide group together and consider whether market opportunities exist within a given technology area.*

➲ **Workshops** *- University : Firm links to undertake research and potentially exploit opportunities (feasibility studies support this).*

2.18 There have been two seminars and five workshops to date covering:

➲ *End User Application Imaging.*

➲ *Chemical Sensing for Water.*

➲ *Biophotonics in the Future.*

➲ *DTI Technology Programme Workshops.*

   • *Next generation Lasers.*

   • *Micro and Nano-manufacturing.*

➲ *Opportunities for Micro and Opto Components in Bio Chips.*

2.19 Typical attendance is about 100 at the market events and 15 to 30 at the workshops. The feasibility awards are a key outcome measure and there have been eight TTOM awards made to date (August 2005).

2.20 Our consultation with the TTOM manager within the MOET Cluster team indicates that he considers that TTOM and the TT project focus on similar issues and potentially the same target groups, but that the support offered/role fulfilled is quite different. The Technology Translator could provide leads to the TTOM programme and to assist in the follow-up activity or where firms need extra support to implement.

O'Herlihy & Co. Ltd.

> We recommend that the Technology Translator agrees the ground rules with TTOM for referring a firm, including suitability criteria, the level of certainty the Technology Translator can offer to the firm and who handles the application.

2.21 In addition to the TTOM programme, we asked consultees which other initiatives they were aware of. Table 2.1 shows very different lists in SE versus the TT contacts:

Table 2.1 – How well do two groups know the initiatives on offer	
SE & Partner Organisations	**Firms & Universities**
Knowledge Transfer Partnerships	Eng.D (Engineering Doctorates)
Scottish Collaboration Innovation Programme	Scottish Manufacturing Institute
Scottish Higher Education Business Portal	TTOM
RSE Fellowships	Smart, Spur
Electronic Design Support Service	FPGA/TT
Virtual Centre for Excellence in Communications	Knowledge Transfer Partnerships
MX Alliance	SCORE
TTOM	PoC Outcome Manager Support

2.22 It is notable from Table 2.1 that there are just two programmes that were identified by both groups namely Knowledge Transfer Partnerships and TTOM. This suggests that universities' and firms' understanding of the Network's priority initiatives is not high and does not concur with their own priorities. It also suggests that the Network does not appreciate the initiatives that firms deem to be important.

> We recommend that the Technology Translator prepares a briefing note for firms on the types of support available.

Technology Translator and Scottish Development International (SDI)

2.23 The TT programme is well known to the SDI staff especially the Communications/MOET trade and investment teams. The Translator is often called upon by SDI to assist in case development through his knowledge of key players in academia and industry and in relation to communications issues more generally. The current contact at SDI is the former manager of the TT project at SEEL and is therefore well briefed on its positioning and operation.

2.24 SDI considers the TT project to be a value-added service. The Technology Translator can help deliver measures for both the sponsor LEC and SDI in telecommunications and related projects. The Technology Translator's role is considered to complement that of

7

Account Managers as he can focus on specific technology/business development issues that time pressures prevent an Account Manager from addressing. The Technology Translator's role was also considered to complement the universities' commercialisation offices.

The future

2.25 Consultees considered that the TT project was sound and is one that should continue in the future. Indeed, there was a view that it could be expanded to cover other sectors or industries.

2.26 There was a strong view that the Technology Translator should be someone who has a good understanding of the technologies being targeted and should not be a "generalist" advisor - generic business advice should be available through Account and Client Managers.

2.27 While there was broad agreement that the programme should continue and potentially be expanded, there were a few specific suggestions as to where any expanded initiative should focus.

2.28 In Chapters 5 and 6, we return to consider the possibility of expanding the programme and how this might be managed.

Chapter 3

The Participant Interviews

The survey

3.1 Several research principles were requested by the client and agreed by the consultants at the Inception Meeting:

➲ *The Translator would put forward firms and academics for interview and only those selected by him were to be contacted.*

➲ *The review was to focus on the operation of the TT project and should look at the process the Technology Translatorr adopts, identifying what works well and what could be done better but should not be a personal assessment of the individual.*

➲ *Cultural change measurement was to be a key assessment criterion.*

➲ *Given that it was an interim evaluation, the need to collect hard economic impact data was not required.*

3.2 A total of seven interviews with six participating firms and 11 interviews with representatives of university departments and commercialisation offices were undertaken in order to identify the benefits they had derived through the Technology Translator's input.

3.3 These interviews were carried out during July, August and September 2005. Where possible these interviews were face to face and used aides memoire to elicit qualitative and quantitative information.

The Technology Translator role

3.4 The principal role of the Technology Translator is one of facilitator/broker coupled with being an expert/advisor. Participating firms and academics rated the Technology Translator's input very highly and considered that his knowledge and tenacity were of significant value and were instrumental in creating and maintaining the relationship between the partners. They also felt that his extensive technical and commercial knowledge was fundamental to a project's subsequent success.

3.5 While this role was well received by participants, there were concerns expressed by the universities' Commercialisation/Industrial Liaison officers. They were uneasy about the direct contact with academics and the opportunity for them to work directly with firms,

O'Herlihy & Co. Ltd.

potentially bypassing the university's in-house advice. One university raised a specific concern while all the others suggested that they would not like to see their relation with the Technology Translator developing in this way.

3.6   The TT project has proved that firms and individual academics can work together without the early (or any) involvement of the universities' Commercialisation/Industrial Liaison officers, We do not recommend that keeping them in the dark should become the norm. This would create bad feeling and make collaboration less likely.

> If SE take the view that the Universities' Commercialisation/Industrial Liaison officers do not 'add value', this should be tackled at a senior level and not be left to individual initiatives to muddle through.

3.7   From the firms' perspective, the Technology Translator role provided significant help to them in diagnosing their "technological need". Firms commented that the Technology Translator "spoke their language" and "understood fundamentally how technology contributes to the firms business success". This was considered unusual in a person effectively representing government agencies in Scotland - advisors tend to understand much better the commercial/financial aspects of the business but often struggle to appreciate fully how a firm's specific strength in a technology provides them with a competitive advantage in the marketplace.

3.8   Firms also commented on the value of the Technology Translator's ability to sift through government initiatives and identify what was relevant for their needs. They saw the Technology Translator as having a tripartite stakeholder group comprising companies, academia and government (especially SE).

3.9   A couple of firms commented that they saw the Technology Translator fulfilling the role of an SE Account Manager but at a technical level.

3.10   There are a number of initiatives that both academia and industry would like investigated for further development, namely:

   ➲   *CASE studentships.*

   ➲   *A Ph.D. seminar.*

   ➲   *Technical support/development for CTOs.*

3.11   The feedback on the Technology Translator's individual input was particularly positive. Firms and academics rated highly his technical knowledge and his thorough tenacity in

10

following up every point of action that was discussed at a meeting. He was considered to have excellent networking skills and knowledge with a good understanding of both the research base and the commercial base in Scotland. He was also considered to be a good diagnostician (principally in the case of firms).

Activities

3.12 In addition to providing the communication conduit between firms and universities, firms also felt that there was scope to develop his strong network knowledge to facilitate firm-to-firm contact and that this would be very useful for them. Indeed there is one example of this happening and it may result in an important project for the firms and reinforce Scotland's reputation for R&D.

> We see firm-to-firm contact as a potential strength of the TT project and recommend that they are encouraged by the TT project's managers by specifically allotting time and targets to the activity.

3.13 From the perspective of both firms and academics, there is no direct 'competitive product' available elsewhere within the Enterprise Network. The TTOM programme is seen as being complementary. There is some overlap with the DTI International Technology Promoter programme (www.globalwatchonline.com) but we conclude that as the Technology Translator is identifying useful collaborations within Scotland this is not a concern.

3.14 Perhaps not surprisingly and as mentioned in the previous section, CASE and Eng.D. industrial research posts are a significant part of the Technology Translator armoury for firms and to a lesser extent universities.

3.15 Geographically, participants are skewed towards the West of Scotland (academic and industry) although there are specific cases in both Central and Eastern Scotland. Discussion with a number of the academics suggests that this may be the result of the profile of the original participants who were engaged in finalising the Faraday proposal.

3.16 The Technology Translator's intervention has enabled non-core, speculative research to be undertaken. This may generate future products but it is difficult to quantify the likely economic impact now.

3.17 Some smaller firms commented that the risk of a project failing got in the way of starting a project with an uncertain outcome and that a financial incentive would be of value.

11

Cultural Impacts

3.18   A crucial element of our investigation was to determine the cultural impacts of the TT project. From experience we know that it is difficult to elicit this information in a structured interview which gives limited scope for getting 'beneath the skin' and finding out the motivations and expectations rather than just outcomes. So for this analysis we designed a specific aide memoire to capture key aspects of the change in culture resulting from participation experienced by both firms and universities.

3.19   We do not believe that previous experience of collaboration always means that no further culture change can happen. We do believe however that organisations and individuals that have not had previous contact on such projects are most likely to feel a positive change, a surprise even, from a project involving an intermediary Technology Translator trusted by both 'sides'.

3.20   There were relatively few active projects (5) reviewed in the sample. However there was one project where we had data from company, academic and intermediary (KTP) interviews.

3.21   In this case we reviewed the perceptions of a large company towards the technology translation process.

Figure 3.1 The firm's view of itself before and after the project. See Appendix 2 for definitions.
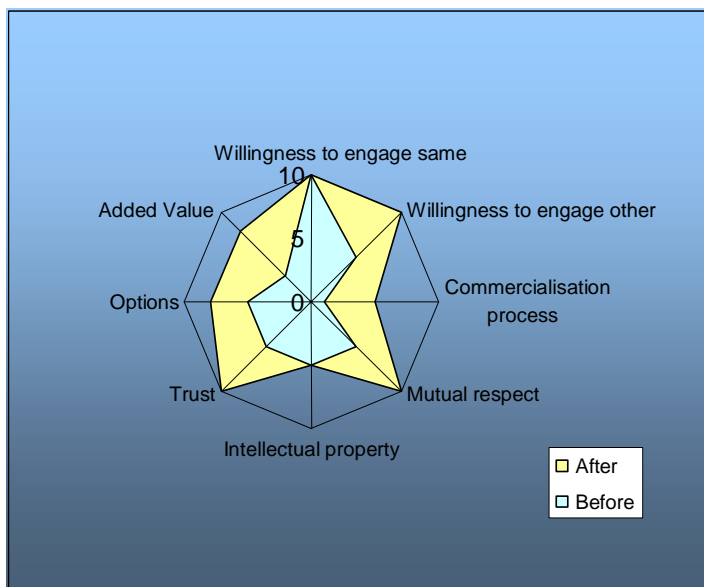

3.22   From the data presented in Figure 3.1, the company's willingness to engage with the academic partner did not change through the technology translation process. However,

O'Herlihy & Co. Ltd.

its willingness to engage with other universities was increased dramatically. The bonds of trust and respect were seen as being the key factors.

3.23   The translation process was seen to increase the company's awareness of the HEI commercialisation process and generated added value in terms of new company to company links.

Figure 3.2: The firm's view of its academic partner before and after the project. See Appendix 2 for definitions.
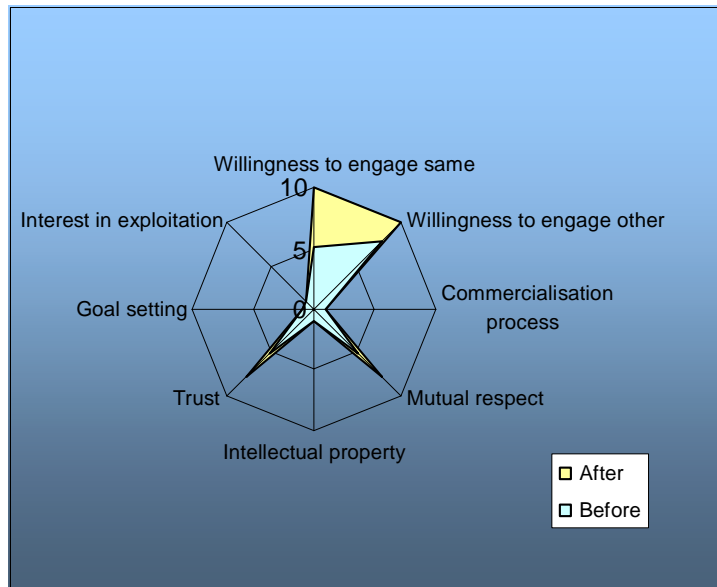
3.24   The company perceived that the HEI partner became more willing to engage with it and other industry partners. However, the company did not perceive that the academic partner has gained new insight into the rigours of the commercialisation process (N.B. the project is still at its formative stages). In addition the company did not perceive there to be any change in the HEI attitude to exploitation.

3.25   We have summarised the broad range of issues from the various interviews in the table below. This presents the views from firms and academics and cover their opinions on themselves and on their partner.

O'Herlihy & Co. Ltd.

	Their view of themselves	*Their view of their partner*
Academic	**Trust was built during the project** **Improved understanding of commercial pressure** **We are big boys and shouldn't need our hands held in collaborations** **Learned that collaborations are a new way of downloading our knowledge** Less experienced academics have problems with timescale and priorities It is not worth our while telling SMEs what we do IP ownership remains an issue	**Willingness to engage improved** **Improved understanding of academic pressures** **Has increased their effective use of other programmes e.g. M.Eng** **Less ignorance of what HEIs do** Do not understand role of HEI base SME's want quick answers in one area Unless they pay the full economic cost, the IP should stay with the university
Commercial	**KTP is a useful mechanism** **Improved our willingness to engage in other projects** **Respect and trust increased** HEIs are normally inflexible We fixed the approach they could take IP ownership Dealing with companies is hard **Still n**ot sure of the commecialisation process We didn't give their knowledge any more value than our own	**Improved understanding of commercial pressure** **Improved dialogue with companies** **Moved from seeing it as an interesting academic exercise to a commercial opportunity** **It was a win-win – they published papers** Do not understand companies especially SMEs Confidentiality needs to be addressed case by case Commercialisation office can get in the way

Bold = positive Unbold = negative

Impacts

3.26   Only one firm was able to provide an estimate of the likely economic impact and these figures were provided against the backdrop of significant caveats and vague forward projections.

3.27   We do not consider that this is a significant issue <u>at this stage</u> for several reasons:

➲   *Technology translation in whatever form requires collaboration between groups in academia and in the commercial bases - from experience of delivering such programmes and of evaluating initiatives elsewhere, it takes a considerable length of time (~12-36 months) for parties to discuss and agree the terms of reference and initiate the project proposal. The TT project has been running for only approximately 14 months.*

➲   *Feedback from both parties indicates that the TT project is of considerable value in brokering relationships and establishing contact.*

➲   *It is also clear that there is a flow of projects in the pipeline and that as these come to fruition, financial benefits are likely to accrue both parties.*

We recommend that the TT programme monitor the progress of projects that complete and gain feedback from both firms and academics as to the likely benefit that will accrue by asking informally about – and noting formally on the file - product and process launches, license deals done and significant sales together with anecdotal evidence that the programme is having additional economic impact. This will make a future economic impact assessment easier and more robust.

3.28   Other non-financial benefits that have accrued to participants include:

➲   *Finding academic expertise firms did not know existed in their field.*

➲   *Very well networked.*

•   *'does our networking for us'.*

➲   *Capturing a firm's requirement.*

•   *feeding this back to the firm for approval and gaining agreement.*

•   *finding academic expertise to address the issue.*

➲   *Following-up every action thereby maintaining both firms' and academics' momentum.*

➲   *Putting consortia together quickly.*

➲   *Helps firms work through the changing structure of public sector support (borne out to an extent by the findings of Table 2.1).*

15

- ⮑ *Enables/facilitates academics to be recommended to firms – they find it hard to make inroads to SMEs without an (impartial) introduction.*

- ⮑ *Helps SMEs to know who to approach and how to do it.*

- ⮑ *The Technology Translator gets around the mutual disparagement of academics and commerce.*

- ⮑ *Identifies trustworthy partners for both firms and academics.*

  - • *facilitates increased trust on both sides.*

- ⮑ *Increased effective use of other programmes/initiatives.*

- ⮑ *Understands and appears to communicate to academics the commercial pressures faced by participating firms.*

Additionality (the converse of Deadweight)

3.29 Additionality is a fundamental criterion in the assessment of economic impact. It is a measure of the extent to which an activity, targeted by the Public Sector's intervention, would not have occurred:

- ⮑ *At the same time.*

- ⮑ *At the same scale.*

- ⮑ *To the same standard or quality.*

3.30 If an SE supported activity would have occurred anyway to the same scale, time and quality, the associated impact of this support is zero.

3.31 The assessment of additionality requires that the SE Network is absolutely clear in its understanding of the market failure being addressed and the activity it is supporting in order to address that failure. Within this context, the assessment of additionality of collaborative research projects usually measures whether the firm or university would have undertaken the research without Network support being available. For one of the larger firms (which had several Technology Translator-assisted projects running in parallel), it was very clear that the activity would have taken place anyway in house. Implicitly, this indicates that a university would not have been engaged. For universities, the research generally would not have taken place without the Technology Translator's input. Using this definition, the additionality is limited and the future economic impact is likely to be low.

3.32 If additionality is defined as the likelihood that a collaboration in itself is a good thing and would not have occurred without the TT project, then feedback from the sample indicates that additionality would be high. Additionality is likely to be greatest where:

16

➲ *An small company is involved rather than a large company.*

➲ *The commercial partner has not worked with HEIs before.*

➲ *The academic partner has not worked with the commercial sector before.*

➲ *The collaboration is company/academic rather than company/company.*

3.33 The individual academic was 'experienced' in all sample cases. Accordingly, the cultural impact will be lower than if the academic partner has not collaborated with an industrial partner before. Where the commercial partner is also experienced there may well be a change in attitudes but this is likely to be less marked than for a small firm whose preconceptions might, happily, have been demolished by the excellence of an academic partner.

Table 3.1 – Summary Assessment of Additionality : Sample projects							
Project	**Status**	**Partner 1**	**Experienced?**	**Partner 2**	**Experienced**	**Actual additionality**	**Likely cultural impact**
Wimax network	Likely project	Large company	Yes	Large company	Yes	Low	Medium
DSP in CCTV	Active	SME	Yes	HEI	Yes	High	Medium (ie only on SME)
CCTV motion detection	Active	SME	?	HEI	Yes	High	Medium
DSP telecoms	Active	Large company	Yes	HEI	Yes	High (academic) Low (firm)	Moderate (both)
Home automation	Likely project	Large company	Yes	HEI	Moderate	High	Low

3.34 The data in Table 3.1 indicates that the likely cultural impact will be low to moderate. There are three main reasons for this observation:

➲ *Participating firms had established contacts with and good experience of university collaborations.*

➲ *Academics tended to have a sound track record of working with the commercial sector.*

➲ *There have been some firms who have participated on a number of projects – it is likely that the additionality will be lower in such cases as the firm increasingly appreciates the benefit of engaging academic expertise.*

3.35 Our interviews reinforced the view that this selection process suited both parties well – both academics and firms indicated that they were reassured that the Technology

O'Herlihy & Co. Ltd.

Translator would make an independent assessment of the partners' respective fit. However, there is relatively little breadth in the participant base – this may be appropriate given the technological specialisation of the Technology Translator's remit but we feel that it is appropriate to question whether the participant base (especially firms) could be broadened. We return to this in our Conclusions section.

The Technology Translation Landscape

3.36   There were issues raised in the project brief and at the inception meeting that reflected the perception that Technology Translation addressed a complex market requirement. The first was to provide a snapshot of Technology Translation within the Scottish Enterprise network and the second was to compare the initiative with best practice in similar UK initiatives. To address these issues we developed a schematic diagram of the topography of technology and discussed this with all of the interviewees. This is illustrated in Appendix 3.

3.37   As can be seen from Appendix 3 there are a number of programmes and initiatives that directly and indirectly relate to the Technology Translator. They range from web based information sources such as www.university-technology.com, through funding programmes such as SEEKIT to staffed resources such as Technology Transfer in Optoelectronics and Microelectronics (TTOM) and the Innovation Relay Centre (IRC). None directly conflict with the Technology Translator programme.

3.38   The key projects in terms of company base were the funding programmes, in particular SCIS, SMART and SPUR funding for 'in-house' product development. These were seen to be valuable albeit that the application process (SMART/SPUR) can be 'long-winded'.

3.39   Discussions with the Academic partners in the Technology Translator project revealed that student funding mechanisms were important, specifically:

➲   *Knowledge Transfer Programme (KTP) which covers the cost of primarily graduate engineers working in companies.*

➲   *Eng.D. company based engineering doctorates. These are related to KTP but have the benefit (academic) of resulting in the creation of new, publishable knowledge.*

➲   *CASE Industrial Studentships which are similar to the Eng.D. programme.*

➲   *Proof of Concept for*

  • *Funding research.*

18

- *Developing the academics business skills.*

- *Creation of spin-off companies.*

3.40   There was only one private sector company (UXL) cited as offering related technology transfer/translation support.   In addition, the DTI funded International Technology Promoter programme (delivered by another David Jack), was not cited by any of the interviewees or consultees.

O'Herlihy & Co. Ltd.

Chapter 4

Benchmarking

4.1   The tender brief asked for comparison with the aims and performance of the Technology Translator project with best practice in similar UK and possibly international initiatives. This is the focus of this chapter.

UK examples

Faraday Partnerships

4.2   There are currently 24 active Faraday Partnerships throughout the UK. Faraday Partnerships are dedicated to improving the competitiveness of UK industry through more effective interaction between the science and technology base and industry. These Partnerships have 4 key principles: Promoting active flows of people, science, industrial technology and innovative business concepts to and from the science & engineering base and industry, promoting the partnership ethic in industrially-relevant research organisations, business and the innovation knowledge base, promoting core research that will underpin business opportunities, promoting business-relevant post-graduate training, leading to life-long learning.

4.3   As part of the DTI's new Technology Programme, (www.dti.gov.uk/technologyprogramme), the Faraday networks will have two scions – Collaborative Research and Development and Knowledge Transfer Networks (KTNs). The objective of Collaborative Research & Development is to assist the industry and research communities to work together on Research & Development projects in strategically important areas of science, engineering and technology, from which successful new products, processes and services can emerge. It also primes the flow of the latest knowledge and thinking from the UK's science, engineering and technology base to business. Collaborative Research & Development projects must involve two or more collaborators, at least one of which is from industry.

4.4   Some of the current Faraday's are expected to be succeeded by Knowledge Transfer Networks after the review. KTNs will promote and accelerate the transfer of knowledge between the science, engineering and technology base on the one hand and industry on the other. KTNs offer invaluable opportunities through networking to make contacts and exchange information with other business, academic or research organisations working in similar fields or sectors. KTNs will also play an important role in the development of the

Technology Strategy, providing stakeholders with a focussed communication channel to participate in its development and a source of credible information and opinion for Government to draw on.

4.5   An example of technology transfer and translation, within the current structure, is **the SMART Optics Faraday Partnership** (www.smartoptics.org). SMART Optics is an active network of more than 100 businesses and academic groups with the common aim of generating new 'enabling' optical technologies and successfully applying them commercially in a diverse range of markets. To do this the Partnerships has developed a pro-active approach to meet the needs of industry and academia called "technology translation". This involves a team of 4 qualified staff with both commercial awareness and knowledge of the technology sector who work to identify opportunities for innovation in the marketplace and connect them with emerging technologies in academic and research laboratories. They then facilitate the exploitation of these opportunities, principally by setting up and helping to manage collaborative partnerships between academic and business organisations.

London Technology Network

4.6   London Technology Network (LTN) is a government-funded initiative that aims to improve the profitability and efficiency of business by creating links between industry and London-based academia. LTN's four main objectives are to:

- ➲   Work with its network of large and small companies to map their short-, medium- and long-term technology needs

- ➲   Help universities respond to industry's need for technology-related knowledge acquisition

- ➲   Match the technology needs of client companies to London's world-class researchers.

- ➲   Support technology-focused special interest groups and encourage better and more frequent interaction between companies and universities.

LTN Technology Consultants advise how, why and where industry can benefit from a range of mechanisms, such as consulting by faculty members, licensing new technologies, or placing staff in academic laboratories. London Technology Network covers scientific developments in a range of technology-intensive industries including Life Sciences, High-Technology and Engineering. Technology Consultants identify technology requirements and then introduce world-class researchers with appropriate knowledge and skills. The Technology Consultants cover: Life Science Physical Sciences and Software/Projects sectors.

Figure 4.1 – LTN Network Model
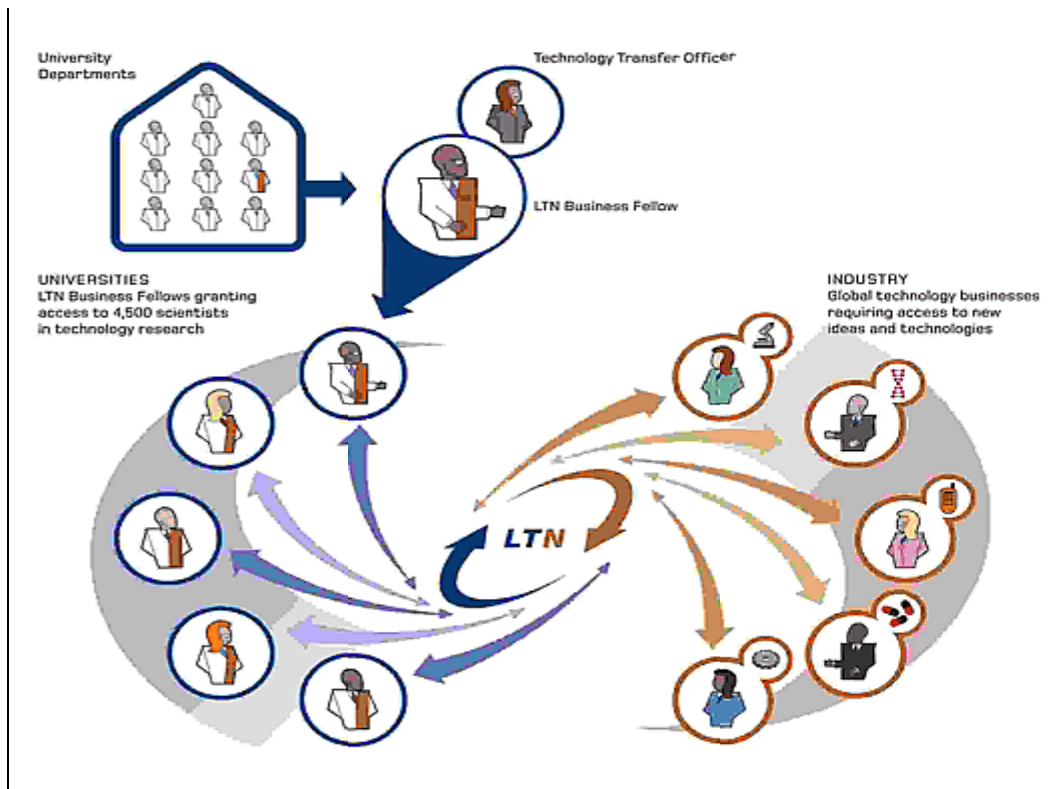
4.7   Provision of technology transfer support at a regional level within the East Midlands is provided by over 30 initiatives delivered by a wide variety of organisations including Higher Education Institutions (HEIs), the DTI , Research and Technology Organisations (RTOs), EMDA   cluster groups, other regional trade organisations and specific technology transfer networks.

4.8   There are three key elements in the infrastructure.

➲   ***Technology Location:*** *Support can be given to organisations in identifying and locating potential sources of technology to fulfil their need. This also enables potential sources of technology to find a market.*

➲   ***Technology Brokerage****: Support can be provided by acting as a broker between the technology provider and the technology recipient. This can range from providing the contractual background (including IPR) to providing project management assistance and even locating potential grant resources to fund the technology transaction.*

➲   ***Resource for Transfer****: Support can be provided by providing resource to actually fund the technology transfer either partially or wholly.*

Figure 4.2 – A Framework for Technology Transfer Support

O'Herlihy & Co. Ltd.
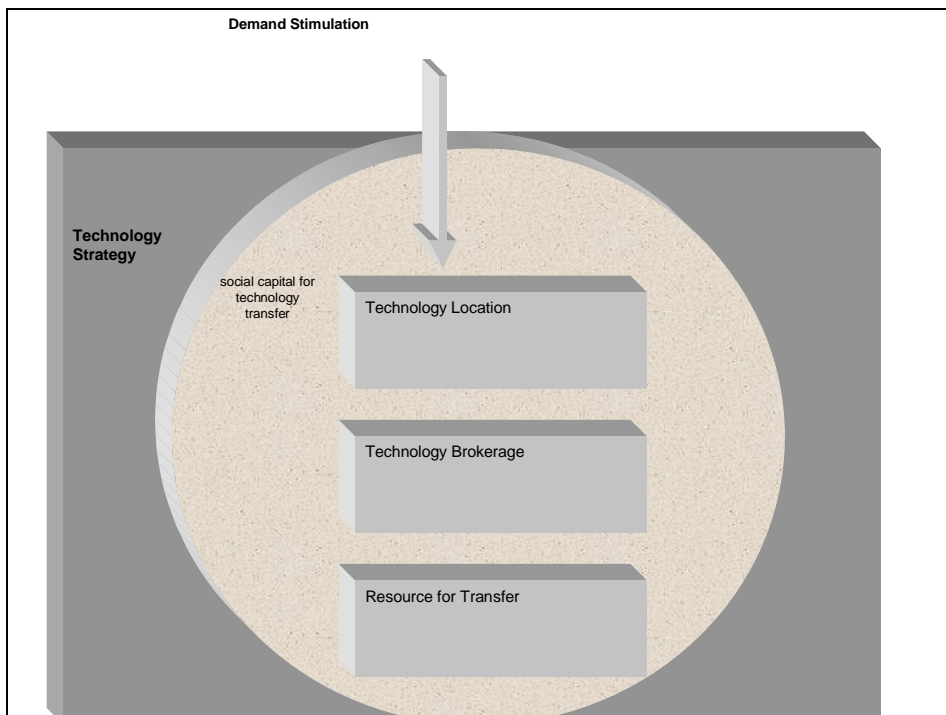
4.9   EMDA is proposing to develop a local model for technology transfer support has the following key features:

●   *It is based upon the East Midlands' strategic regional technologies.*

●   *It then distinguishes between the needs of regional technology leading companies and other technology followers by providing different support for each group.*

●   *It uses a 'Faraday Partnership' model to provide Regional Centres of Technology Excellence.   These are long-lasting partnerships between technology leading companies and regional HEIs and RTOs to co-develop and transfer technology that makes a significant impact on the East Midlands's economy. This model is illustrated in Figure 4.3.*

Figure 4.3 – A potential Technology Transfer Model
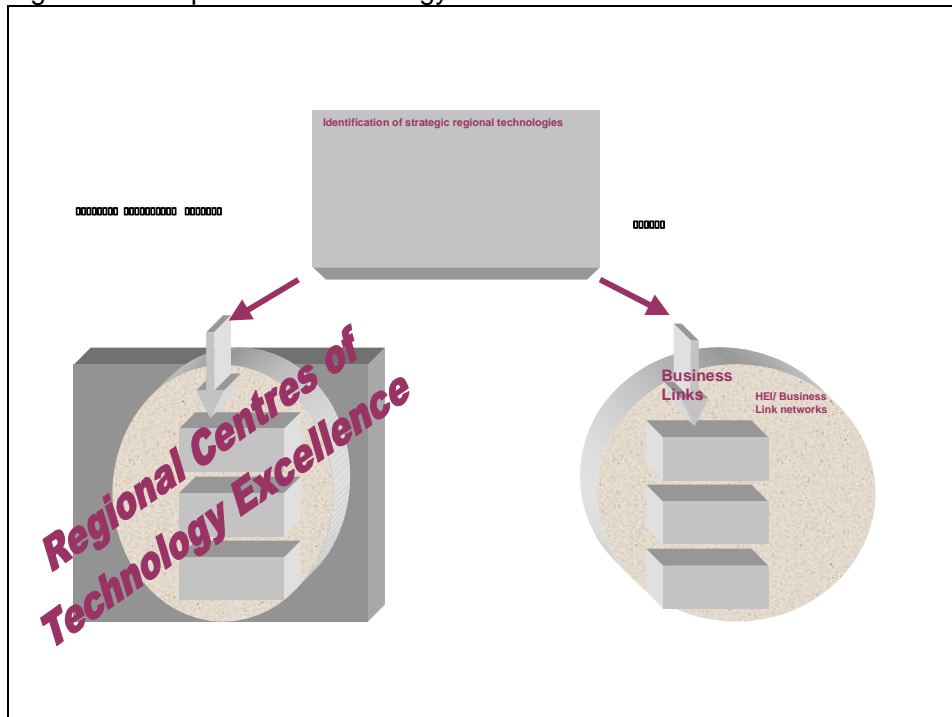
4.10   The Centres will be based on a specific technology or on a group of It will provide a holistic environment for technology co-development and transfer between its partners.

4.11   The mechanisms by which these improvements for technology follower companies will by using 'technology translators' within Business Links and by providing opportunities for stronger relationships to develop between Business Links and HEIs within the region through the creation of 'Technology Fairs.'

4.12   'Technology Translators' would be appointed to stimulate demand by emulating the role of technology translators within Faraday Partnerships and contacting companies on an

24

individual basis to review their current technology strategies and to identify opportunities where successful technology transfer could improve their competitiveness. They could also act as technology locators and use these sessions to provide potential locations for technology to fill identified gaps. This type of role integrates with the more proactive stance proposed for Business Links within the East Midlands. In order for technology translators to successfully fulfil this function, they will need:

➲ *Sector specific knowledge of regional and national technology providers.*

➲ *Background skills and expertise that enable them to inspire confidence at directorial level in the companies that they visit.*

4.13 The number of technology translators required to support the target figure of ~5000 businesses per annum would be of the order of 25 people giving an approximate cost of £1.25M per annum excluding infrastructural and support costs. Although this service would be accessed via Business Links, technology translators need not be directly employed by those organisations. A technology translation service could be bought from other organisations such as RTOs or even Faraday Partnerships themselves.

Qi3 (www.qi3.com)

4.14 Qi3 is a private sector organisation based in Silicon Fen – Cambridge (UK).

4.15 They offer a specific services for Technology Translation which they describe as a fashionable term for the activity that enables public sector technologies to be "translated" into the private sector. This requires an understanding of the languages and cultures of research and business, an extract from the company website bears this out…*In our experience, results are achieved through respect,* (for the partners and this concurs with our observations in sections 3.18 – 3.25)*, an action-oriented approach and a "deal-making" level of personal interaction with the parties.*

International examples

4.16 Two publications provide an insight for Technology Translation albeit that they were based on Technology Transfer principles published by the European Commission. The Commission's Technology Transfer approach tends to focus on 'signed deals' which can be between a university and a firm or more likely between two firms. The first of the publications covers a review of ten years of SPRINT published by the Commission and prepared by Pricewaterhousecoopers and the second is a review of TEURPIN. While the SPRINT review dates from the mid 90s, its observations are still relevant to the process of supporting technology transfer initiatives.

4.17 The TEURPIN model is relevant to the operation of the Technology Translator. It proposes that firms are classified as either technology *providers* or *adopters* and their position in the process is assessed differently in each case. Providers and adopters are the *primary* players in the technology transfer process and it is they who will make the decisions to proceed at key stages in the process. The TEURPIN experience suggests that it is essential that these primary players are not 'distracted' or interrupted by the inputs of other parties *rather* that their interaction is <u>facilitated</u> by a third party. A *facilitator* (who could be the Translator) ensures that the discussions evolve fruitfully. The facilitator must be:
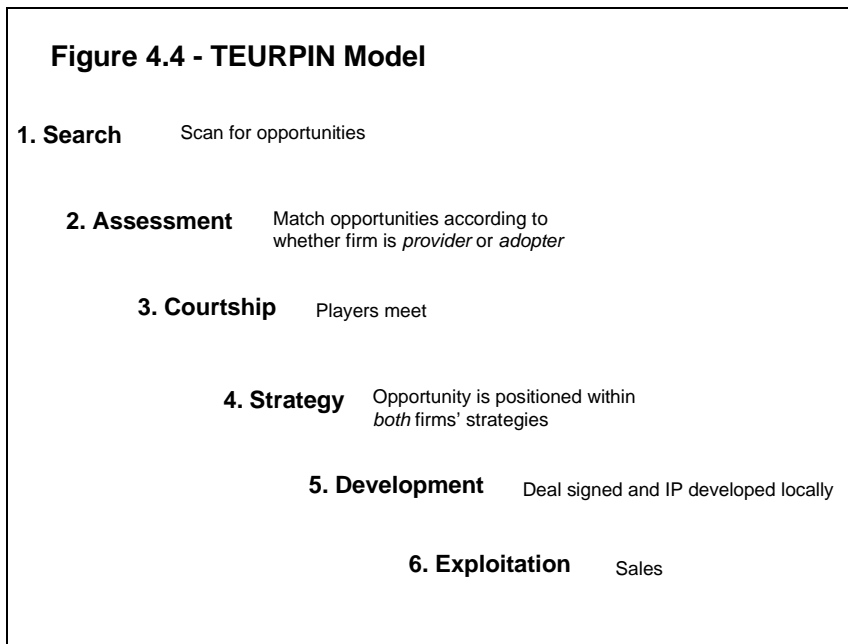
- *Independent.*

- *Knowledgeable.*

- *Flexible.*

- *A good communicator.*

- *A good planner.*

4.18 An interesting aspect of the TEURPIN model is that it is driven by a business need:

- *To increase sales.*

- *To access a new market segment.*

- *To enter a new geographic market.*

4.19 Essentially, these are strategic aims for firms and technology transfer is a tool which can be used by firms to achieve their strategic aims.

4.20 The model comprises six stages as set out in figure 4.4.

O'Herlihy & Co. Ltd.

```
┌─────────────────────────────────────────────────────────────┐
│                                                             │
│   Figure 4.4 - TEURPIN Model                                │
│                                                             │
│ 1. Search      Scan for opportunities                       │
│                                                             │
│     2. Assessment    Match opportunities according to       │
│                      whether firm is provider or adopter    │
│                                                             │
│        3. Courtship    Players meet                         │
│                                                             │
│           4. Strategy   Opportunity is positioned within    │
│                         both firms' strategies              │
│                                                             │
│              5. Development   Deal signed and IP developed locally │
│                                                             │
│                 6. Exploitation   Sales                     │
│                                                             │
└─────────────────────────────────────────────────────────────┘
```

4.21   The practitioners recognise that a firm can drop out at any stage but three are critical:

➲   *Assessment – firms drop out if the technology match is not strong.*

➲   *Courtship – firms drop out if the personal or cultural chemistry between the two parties is not sound.*

➲   *Strategy – firms drop out if the commercial fit is not good.*

4.22   If overlaid on the TEURPIN model, the Technology Translator's input would appear to be heaviest at the front end of the process. We return later to discuss how the SEEL might measure the different stages of progress being made by the Translator when facilitating deal between two parties.

SPRINT

4.23   The SPRINT experience is informative in that it looked at the concept of Transnational Technology Transfer from the perspective of both the Public and Private sectors. It observed that even the most commercially active practitioners achieve no more than one or two signed deals for every hundred leads. This observation emphasises the importance of being active to stimulate potential *and* being selective in order to identify those prospects that offer the greatest potential.

O'Herlihy & Co. Ltd.

4.24   The SPRINT review identified four key client attributes for success:

  ➲   *Clear commitment by the firm to the project.*

  ➲   *Willingness and preferably a desire to work with non-local organisations.*

  ➲   *An affinity with the Technology Transfer Network's typical client profile.*

  ➲   *Financial solvency.*

4.25   These observations and those for TEURPIN provide pointers to consider when appraising the selection and support of clients. We return in our Conclusions to consider these in more detail.

European Commission review of Innovation Relay Centre (IRC) Performance

4.26   A member of the IRC Secretariat produced a set of comparative tables that were presented to the IRC Network in the summer 2004. It presents data for two groups, namely the UK and Ireland and the whole IRC Network.

Table 4.1: Input required to achieve One TTT						
	Company Contacts	Company Assists	Negotiation started	Offer/Request published	Company Visits	Client Base
All IRC	310	47	9	12	26	482
IRC UK&IRL	121	10	4	4	9	81

Source: European Commission

4.27   The data presented in Table 4.1 indicate that IRC UK & IRL are two to three times more efficient in converting contact with firms to a signed agreement but that even so, it takes around 30 company contacts to get a negotiation started between any two.   This suggests that a mix of broad contact and careful selection is required if the Transfer process is to be effective.

Table 4.2 Length of time to achieve One Transnational Technology Transfer agreement							
	< 3 mths	3-6 mths	6-12 mths	1-2 years	2-3 years	3-4 years	> 4 years
All IRC	0%	29%	28%	27%	8%	6%	2%
UK&IRL	0%	24%	22%	18%	18%	13%	4%

Source: European Commission

4.28   The conversion profile presented in Table 4.2 suggests that the IRCs in UK and Ireland take around one to two years to gain a signed collaboration agreement. While not directly comparable to the Technology Translator programme, these findings do provide an indication of the typical timescale involved and indicate that Technology Transfer and Technology Translation is a time consuming process. We return to this issue in our conclusions.

O'Herlihy & Co. Ltd.

Larta and Network T2

4.29   Larta Institute (www.larta.org) is an independent, private nonprofit corporation registered in California. The Institute was originally formed in 1993 after defense downsizing caused the loss of 300,000 jobs lost in Southern California. Since that time, Larta Institute has expanded dramatically to serve thousands of clients in a wide variety of technology sectors globally. Since 1993, Larta Institute has been the official technology commercialization agent of the State of California. Larta also manages a "venture fund" focused on turning cutting-edge technologies into commercial products and services. This has resulted in 259 new patents and $619 million in outside investment. Larta also manages a technology transfer network called Network T2. It is consortium of 15 universities and research institutions with a driving purpose: to accelerate the innovation process.

4.30   Network T2 includes large research universities at the world's cutting-edge (UC Santa Barbara, Caltech, UCLA, UC San Diego, USC, UC Santa Cruz, UC Riverside, and UC Irvine); smaller, fast-rising universities and independent research institutions at the forefront of knowledge (Cedars-Sinai Medical Center, City of Hope, and Harbor-UCLA Research and Education Institute).

4.31   In addition, Network T2 affiliates come from a variety of sectors, including life sciences (Genzyme, Invitrogen, and BD Biosciences Pharmingen), materials and manufacturing (DuPont), consumer products (Johnson & Johnson Consumer), venture capital (Redpoint Ventures and Tech Coast Angels), energy (Southern California Edison), professional services (Morrison & Foerster, Latham & Watkins, PricewaterhouseCoopers, and Monitor Group), and government (State of California).

4.32   Under the management of Larta Institute, the institutions in Network T2 serve as magnets on their respective campuses for new technologies that have potential for commercialization. Network T2 provides the institutions a common platform and a set of resources to link technologies and business opportunities and to smooth the process of technology transfer.

O'Herlihy & Co. Ltd.

Chapter 5

Technology Translation – Operation and Management

What is the Role of the SEEL Technology Translator?

5.1 Based upon our interviews a Technology Translator is:

➲ *An individual who is a **technical** expert, has sound **commercial** experience and is a good diagnostician so can frame the firm's need accurately and succinctly.*

➲ *Someone who constantly develops their **network**.*

➲ *A **broker** who facilitates deals between firms and University departments where these deals rely on trust, in particular that the academic partner understands the pressured reality of working with commercial organisations.*

➲ *An individual who has given firms an alternative view of available local technical expertise. Many of the companies thought they knew everyone who was active in the marketplace yet often found new and relevant academic specialists who could address their specific technical problems.*

5.2 The key success criterion is the Technology Translator 's credibility with both commercial and academic parties. This comes from a blend of technical knowledge, commercial experience and interpersonal skills.

5.3 Another important factor in the Technology Translator's success is the ability not just to link 'know-what' (the knowledge of facts), with 'know-how' (the skills/ability to do things at a practical level) but, more importantly, 'know-who' (referring to social relations and networks). This practical application of the economics of social networks[2] underpins the view that knowing people may be of greater importance to innovation than knowing scientific principles or technology.

5.4 Mutual trust is a critical characteristic that defines the Technology Translator's role. It is the mutual trust and respect by both universities and firms that leads the joint research projects being initiated and taken forward. This trust appears to be built upon the Technology Translator's ability to see the potential contribution that each party can make to the other. In essence, the goodwill that is developed by the Technology Translator requires both firm and university to deliver the goods.

---

[2] Accelerating Technology Transfer and Commercialisation – Kauffman Foundation (November 2004)

O'Herlihy & Co. Ltd.

5.5   The feedback from firms supports research undertaken by the Association for University Research and Industry Links (AURIL) into the competencies required by those engaged in technology transfer. This research resulted in a CPD framework being developed for Knowledge Transfer practitioners (Appendix 1). This framework is structured around 6 key competencies, against which the practitioner's skills and competencies are assessed, namely their ability to:

- ➲   *Manage Information and Communication.*

- ➲   *Manage Relationships.*

- ➲   *Manage Projects.*

- ➲   *Manage Commercial interface.*

- ➲   *Manage Operations within a Legal Context.*

- ➲   *Problem solve and manage the decision making process.*

We recommend that the AURIL model is used as the basis of the competence assessment of future Technology Translators should SEEL decide to expand the scheme.

Management

5.6   SEEL has several options which are dependent on their desired positioning of the TT Project and their future plans for its expansion.

5.7   The current arrangement with EDC managing the single Technology Translator adds little value except to:

- ➲   *Provide 'contractual cleanliness' for SE as the Technology Translator is not on SE's payroll.*

- ➲   *Differentiate the Technology Translator from SE and emphasise his uniqueness/independence.*

- ➲   *Provide limited specialist/technical support.*

5.8   Given that there is currently just one Technology Translator who operates relatively independently and already has a weekly meeting with SEEL, we feel that if he was to report directly to SEEL the administrative burden would be low.

Unless EDC contribution is considered value for money, we recommend that a single Technology Translator should be employed by SE and report directly to SEEL.

Expansion - Should the translator concept be expanded?

O'Herlihy & Co. Ltd.

5.9   Our evaluation has confirmed the need for Technology Translators and the contribution that they make:

- ➲   *Firms don't trust universities.*

- ➲   *Firms don't consider universities have the competence to offer them useful solutions that meet their technology development aspirations.*

- ➲   *Universities find it difficult to make contact with the correct contact in firms and vice versa.*

- ➲   *Universities are wary of working with small firms as they feel that they have unrealistic views of what the universities have to offer.*

- ➲   *Universities also find that firms do not understand the new academic environment where all posts have to be paid for. There really is 'no such thing as a free lunch!'*

5.10   There is a clearly held view among those consulted both in firms and universities that the translator is valuable. This value is a combination of:

- ➲   *Trust.*

- ➲   *Facilitation.*

- ➲   *Problem solving.*

- ➲   *Networking.*

- ➲   *Brokering.*

5.11   If the TT project is to be expanded, we detail below the different aspects that would need to be addressed for this expansion to be managed effectively.

5.12   From our Network consultations (including those with representatives from SEEL), there is a consistent message that the Technology Translator should not act in isolation and should work to support other initiatives being promoted by the Network. We agree with this view as it helps minimise the chance of Translators becoming disengaged from other Network activities – where this happens it can cause confusion among firms which receive multiple approaches from different Network personnel.

5.13   When considering the recruitment of Technology Translator s in new technology areas, there are two independent criteria that should be appraised to identify *the sectors/technologies* in which future TTs might operate:

O'Herlihy & Co. Ltd.

➲ *The priority ranking of the SE Network's Cluster and Industries - will the proposed TT work in a priority Cluster/Industry?*

➲ *Could the competitiveness of SMEs in the Cluster/Industry (or more likely the niche of the cluster within which the Translator operates) improve as a result of research input from a University?*

5.14 For example in the Food and Drink cluster, we know from earlier research that university links are weak and that Scotland's SMEs do not perceive value to be gained from such contacts. On the other hand in areas such as life science, medical devices and bioscience, Scotland's SMEs need constant research input in order to remain competitive but often do not have the breadth of contacts or the trust to engage universities. We see Technology Translator having a strong contribution to make to this latter group.

Where should the Technology Translators be located?

5.15 Technology Translator can be independent operators, but they need close links with other Network departments specifically relevant cluster teams, in some cases SDI (an important user of the first TT) and LECs where they lead on a given technology.

5.16 We would propose therefore that a Technology Translator should be affiliated to the department most relevant to their specialism. This is similar to the model that works well for IRC Scotland where:

➲ *There are 7 technology advisers.*

➲ *Each adviser covers a technology specialism.*

➲ *All have close links with Cluster Teams and SDI.*

Given that SE Edinburgh & Lothian is providing the financial resource, it would be appropriate to slant the focus of any future appointments towards either university research strengths and clusters of firms that are represented in the SEEL area.

5.17 We consider that it would be appropriate for up to three Technology Translators to be managed directly by SEEL, However, if the number of Technology Translators is increased to four or more there is a case for a dedicated management resource. This could be delivered either directly by SEEL or through a contract with a third party organisation. The manager would need:

➲ *To understand technology transfer/brokering.*

O'Herlihy & Co. Ltd.

➲   *To be familiar with technology development in firms, especially SMEs, and researchers in Universities.*

➲   *To have good coordination skills, bringing the team together to build identity and unity and facilitate skills and knowledge transfer across the different technology areas.*

5.18   Targeting Innovation Limited provides such a service to SE at present for innovation support in Glasgow. Equally, the Coordinator of IRC Scotland fulfils the role of 'team leader/coach' described above. We are not promoting Targeting Innovation Limited per se, rather we are indicating that it operates a model that could be effective to a future expanded operation of the TT project.

5.19   To conclude, the management structure will depend upon numbers and we consider that there is a need for Technology Translators to be fully aware and in good communication with other complementary initiatives.

O'Herlihy & Co. Ltd.

Chapter 6

Conclusions

Fit with objectives

6.1   The overall objective of the TT project is to facilitate joint working between academia and SMEs. Our interviews and consultations indicate clearly that it is achieving this objective and doing so effectively for the partners concerned. If we assume that facilitating *collaborative research and development* is the overarching objective of the project its additionality would appear to be high suggesting that future impacts are also likely to be high.

6.2   Most of the collaborations are between firms and academics who have experience of university:firm commercial research projects. There has also been a case of a firm being introduced to other firm. Almost all of the firms are SMEs in the strict sense though most of the active collaborations were with local branches of multinationals. That said, the TT project has been influential in encouraging the partners to work together jointly, principally although not exclusively through addressing the 'information market failure' that was characterized by firms being unaware of the expertise available in academia prior to the Technology Translator becoming involved. This indicates that the original rationale was sound.

6.3   We feel there is scope to broaden the base of participating firms and to engage academics who are new to the collaborative research field. We know from our previous evaluation experience in this field (and from the independent research of initiatives such as SPRINT and Teurpin) that there is a relatively high attrition in the numbers of firms 'converting' from an introduction to an agreed piece of joint research.

> Recommendation: Increase the number of participants from both academia and industry by 1) active marketing to firms and academics. For instance, a direct mail campaign based on a briefing note on the types of support available or case studies of projects and 2) encouraging firm-to-firm contacts by the project's managers specifically allotting time and targets to the activity.

Relationships with other initiatives

6.4   Our consultations indicate that the principal initiative relating to the TT project is the MOET Cluster Team's Technology Transfer in Optoelectronics and Microelectronics (TTOM). While both have a similar focus their implementation is quite different. The TTOM initiative uses workshops and seminars as its principal mechanism for engaging parties. In selected cases it facilitates collaborative working by providing feasibility grants up to £5,000. The Technology Translator approach is based upon a discussion with the firm and identifying and facilitating one-to-one contact with relevant academics.

6.5   There was felt to be scope to increase communication and capitalise upon leads between TTOM and Technology Translator. At present there is relatively passive communication between the two initiatives yet they are addressing a similar segment of the market and aiming to achieve a similar outcome. The critical difference is in the approach being adopted. Greater communication between the two would most likely lead to expanding the pool of partners engaged in projects.

> Increase communication to and involvement with the TTOM initiative. We recommend that the Technology Translator agrees the ground rules with TTOM for referring a firm, including suitability criteria, the level of certainty the Technology Translator can offer to the firm and who handles the application.

IRC Scotland

6.6   IRC Scotland offers a similar form of technology/research brokering but their focus is on <u>transnational</u> technology transfer (not local as in the case of the Technology Translator). Our consultations both with the Technology Translator and IRC Scotland indicates clearly that they are complementary and do not overlap.

6.7   Proof of Concept funding, SMART and SPUR were also identified as complementary programmes that can be used as sources of support by the Technology Translator.

6.8   Overall, the TT project was considered to be unique, not to overlap with existing initiatives and was also considered to be adding value by those consulted.

> Recommendation: maintain current focus (programme does not appear to overlap)

Culture change

6.9   The TT project is not achieving significant change in culture among either academics or firms. It is likely to help cement relationships between the parties that will lead to on-going repeat research projects but these projects are between parties who are experienced in university:firm research. The critical contribution of the TT has been to:

- ➲   *Identify two parties who are likely to be able to work well together.*

- ➲   *Facilitate the project by helping firms to 'specify' the research scope and helping universities to present their competence in fulfilling firms' requirements.*

- ➲   *Generally brokering the 'deal' between the two parties.*

6.10   There is scope to engage firms and universities that are less experienced in collaborative research. The participants on TTOM seminars could help to identify potential participants in addition to the current approach of building links through 1-1 contact. This is one way in which improving links to TTOM could make a contribution to the future success of the TT project.

> Stimulate involvement of firms and academics new to collaborative research by actively marketing to them (see 6.3)

Economic impact

6.11   The economic impact in terms of jobs and sales is limited principally due to the projects being at a relatively early stage of implementation and the fact that even when completed, on-going work would be required by the commercial partners before a sales impact might be achieved. This finding is supported by independent research of other technology transfer programmes which indicated low 'conversion rates' of introductions and long negotiation leadtimes. It reinforces the need to develop the project pipeline and stimulate activity.

> We recommend that the TT programme monitor the progress of projects that complete and gain feedback from both firms and academics as to the likely benefit that will accrue by asking informally about – and noting formally on the file - product and process launches, license deals done and significant sales together with anecdotal evidence that the programme is having additional economic impact. This will make a future economic impact assessment easier and more robust.

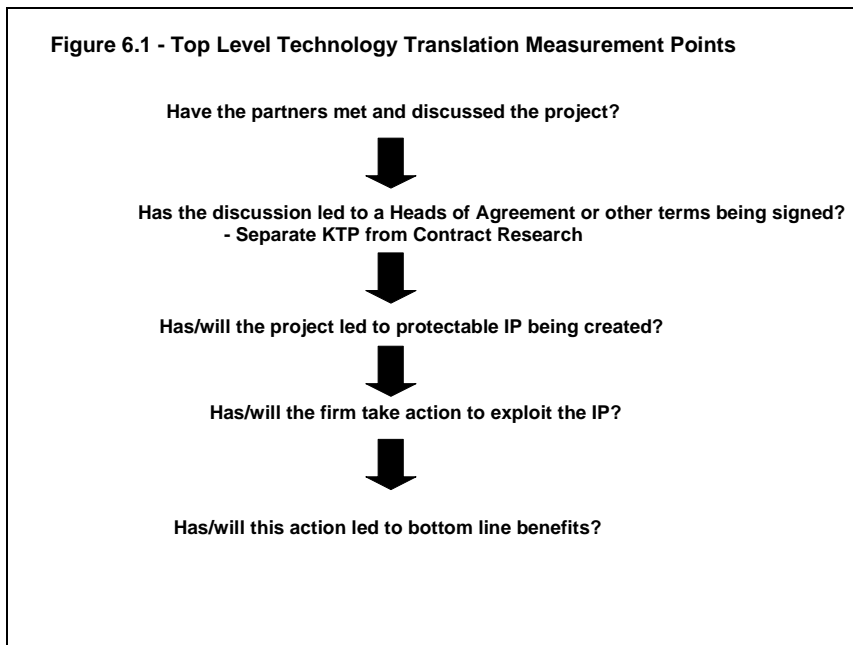6.12   There were three measurement targets set for the Programme in the original Board Paper:

37

➲ *Number of collaborative projects - 20*

➲ *Number of products/processes developed - 8*

➲ *Number of licenses granted - 8.*

6.13   Progress has been made on establishing collaborative projects but, based on our sample, there have been no products or processes developed or licenses granted to date as a result of the initiative. There has been one research publication. The target number of collaborations was relatively high and we think that a figure nearer 15 would be more appropriate as a target. We understand that SEEL now places much greater emphasis on collaboration between academia and firms - much more so than previously - and the influence that collaboration has on Knowledge Transfer. While this will effectively reduce the importance of the specific outcomes, the decision to fund the original board paper was made on the understanding that these targets would be met. Given that this is an interim evaluation, it is appropriate both to review these targets and consider how they might be measured and tracked for the remainder of the project's duration.

Recommendation: Reduce the target for agreed collaborations to 15

6.14   In this regard, our desk research covering the SPRINT programme and our performance data on IRC Scotland indicate that there are several stages that can be tracked (Figure 6.1). This should be seen as a framework.

Figure 6.1 - Top Level Technology Translation Measurement Points

Have the partners met and discussed the project?

⬇

Has the discussion led to a Heads of Agreement or other terms being signed?
- Separate KTP from Contract Research

⬇

Has/will the project led to protectable IP being created?

⬇

Has/will the firm take action to exploit the IP?

⬇

Has/will this action led to bottom line benefits?

6.15   The Technology Translator is effective in facilitating contact between universities and firms that has resulted in collaborative projects being pursued. We feel there is greater

O'Herlihy & Co. Ltd.

scope for the project to deliver 'additional' economic impacts that lead to the quantitative outcomes above. The *additional* achievements to date have largely been derived by the universities.

6.16   If SEEL accepts that the value of the Technology Translator can be measured solely by the number of industry:acedemia projects supported (its *activity*), then there is no need to gather additional information.

> We would recommend that careful thought is given to agreeing and capturing interim performance measures that provide feedback on progress and give an indication of likely future impact.

6.17   We suspect that as the project approaches its full term, SEEL's Management Team/Board will seek assurance that there is an associated *financial economic impact* and should this be the case, other interim impact measures will require to be collected.

> Recommendation: Investigate the scope for tracking project outcomes in order to prepare for the final project evaluation which will be required to report on all three target areas proposed in the original Board Paper

Appropriateness and need

6.18   Feedback from SMEs indicated that they generally had projects to undertake and that although they had contacts in universities, the Technology Translator contact was generally new (and relevant). This is the specific need that is being fulfilled by the Technology Translator.

6.19   The reasons firms gave for not working with a university reflected their misconceptions – these misconceptions were exactly what the Technology Translator is helping to address:

➥   *Lack of delivery.*

➥   *Practical solutions.*

➥   *High cost.*

6.20   Equally, those projects that have proceeded were generally between larger organisations and academics experienced in working with firms. This again reinforces our view that there is scope to penetrate further into the SME base and to work with academics who are less experienced.

6.21　Risk is one reason for a lack of SME projects. While a large company can better afford a portfolio approach to projects, trusting that the one or two successes will be more than pay for the others, in smaller firms each project must be successful. This risk can be partly averted by public sector funding and by arranging collaborations in small results-orientated chunks. We believe it is important for the Technology Translator to have quick access to financial support mechanisms.

6.22　One MNC has several projects running in parallel. The firm had a number of projects it wanted to pursue and finding the right academic partner (through the Technology Translator) started a rush. Once this source of projects dries up, are there enough SMEs and MNCs with Scottish operations to provide the pipeline? Our analysis suggests that three more collaborations will come out of the pipeline. Even given the strong progress to date of six active collaborations, we believe there needs to be more in pipeline; each project takes a long time and a lot of nurturing to come to fruition and there is a high risk of fall-out.

Extending the TT project

6.23　We suggest that the TT project is continued and extended to cover perhaps two other technologies where:

- ➲　*There are relevant company clusters.*

- ➲　*The technologies are complementary to digital communications.*

- ➲　*The work can be led by company needs, not academic offerings.*

- ➲　*There is a critical mass of academic expertise in more than one geographical location.*

> Given that SE Edinburgh & Lothian is providing the financial resource, it would be appropriate to slant the focus of any future appointments towards either university research strengths and clusters of firms that are represented in the SEEL area.

6.24　In adding new Technology Translators, there is a choice between focusing on an industry sector (the needs of the defence industry for instance) or on a technology (software for instance). The current TT project is technology-led. Further, it has a narrow focus on digital communications companies rather than on applications of digital communications in general industry. We believe this narrow focus explains why both companies and academics find the TT credible.

O'Herlihy & Co. Ltd.

> We recommend that the *double focus* of technology applied in technology firms is continued if the project is expanded.

6.25   As outlined in Chapter 5, we also feel that the future Technology Translators should be engaged in priority sectors or clusters and that the individuals should be recruited using a combination of their knowledge and technical skills in the specialist sector. The Technology Translator should have the following qualities:

- ➲   *Broad rather than deep understanding of the technology sufficient to be able to identify the boundaries of an academic's expertise.*
- ➲   *Product-to-market experience in a large or small company.*
- ➲   *Strong diplomatic skills and an ability to over-communicate.*
- ➲   *Be a good facilitator/broker/negotiator.*

> We recommend that the AURIL model could form the basis of the competence assessment of future Technology Translators.

6.26   Management could be delivered either directly by SEEL (where there are less than 4 Technology Translators) or through a third party organization.   Should several Technology Translators be engaged, the managers should have a team building role that enables an 'identify' to be built within the team and to share good practice.

6.27   There would be a benefit in providing small scale feasibility funding (similar to TTOM feasibility grants) but only for naïve partners (i.e. those new to working with academia/industry) to help them to overcome the perceived high risk of entering into this form of collaboration.

> We recommend that you consider introducing feasibility grants for **new** firms and academics.

General Recommendations

> We recommend that SEEL is clear when explaining that the objective of the Programme is to facilitate collaborative projects between universities and firms as opposed to achieve widespread cultural change through collaboration. This is likely to lead to increased trust between *individuals* in firms and universities but is less likely to lead to widespread cultural change for the partners involved.

We recommend that each Account Manager is asked in writing for the level of information that they require.

If SE take the view that the Universities' Commercialisation/Industrial Liaison officers do not 'add value', this should be tackled at a senior level and not be left to individual initiatives to muddle through.

Appendix 1

AURIL/HESDA CPD Framework

Skills Requirements – Technology Translation

	VERY STRONG	STRONG	MEDIUM	LOW
1. Manage Information and Communication				
1.1 Obtain information, evaluate, organise and store the information.	☐	☐	☐	☐
1.2 Via meetings, both inside and outside of the PRO, exchange information to assist decision making and problem solving.	☐	☐	☐	☐
1.3 From a range of both technical and non-technical sources, organise and synthesise information, in a coherent manner and then communication it using appropriate media	☐	☐	☐	☐
2. Manage Relationships				
2.1 Create and maintain relationships with the staff of other sections of the PRO.	☐	☐	☐	☐
2.2 Develop, manage and maintain formal relationships with people and organisations outside of the PRO.	☐	☐	☐	☐
2.3 Assist in managing relationships between PRO staff and external organisations.	☐	☐	☐	☐
3. Manage Projects				
3.1 Either as a member of a team or a team leader manage a range of projects.	☐	☐	☐	☐
4. Manage the Commercial Interface				
4.1 Recognise opportunities for marketing the capabilities of the resource base of the PRO.	☐	☐	☐	☐
4.2 Exercise business development skills and develop and manage business opportunities through to successful outcomes.	☐	☐	☐	☐
4.3 Assist in promoting and marketing the PRO and the KT function to targeted individuals, organisations and sectors.	☐	☐	☐	☐
5. Manage Operations within a Legal Context				
5.1 Understand the basis of intellectual property (IP) in order to be able to contribute as a member of a team to the management of the exploitation of IP.	☐	☐	☐	☐
5.2 Understanding key areas of the law and the basic tenets that underlie relevant branches of the law and how they impact upon operational activity	☐	☐	☐	☐
6. Problem Solve and Manage the Decision Making Process				
6.1 Through the acquisition of data and information evaluate, review and resolve problem areas impacting upon the KT function	☐	☐	☐	☐

O'Herlihy & Co. Ltd.

Knowledge Requirements – Technology Translation

	VERY STRONG	STRONG	MEDIUM	LOW
1. Manage Information and Communication				
1.1 Obtain information, evaluate, organise and store the information.	☐	☐	☐	☐
1.2 Via meetings, both inside and outside of the PRO, exchange information to assist decision making and problem solving.	☐	☐	☐	☐
1.3 From a range of both technical and non-technical sources, organise and synthesise information, in a coherent manner and then communication it using appropriate media	☐	☐	☐	☐
2. Manage Relationships				
2.1 Create and maintain relationships with the staff of other sections of the PRO.	☐	☐	☐	☐
2.2 Develop, manage and maintain formal relationships with people and organisations outside of the PRO.	☐	☐	☐	☐
2.3 Assist in managing relationships between PRO staff and external organisations.	☐	☐	☐	☐
3. Manage Projects				
3.1 Either as a member of a team or a team leader manage a range of projects.	☐	☐	☐	☐
4. Manage the Commercial Interface				
4.1 Recognise opportunities for marketing the capabilities of the resource base of the PRO.	☐	☐	☐	☐
4.2 Exercise business development skills and develop and manage business opportunities through to successful outcomes.	☐	☐	☐	☐
4.3 Assist in promoting and marketing the PRO and the KT function to targeted individuals, organisations and sectors.	☐	☐	☐	☐
5. Manage Operations within a Legal Context				
5.1 Understand the basis of intellectual property (IP) in order to be able to contribute as a member of a team to the management of the exploitation of IP.	☐	☐	☐	☐
5.2 Understanding key areas of the law and the basic tenets that underlie relevant branches of the law and how they impact upon operational activity	☐	☐	☐	☐
6. Problem Solve and Manage the Decision Making Process				
6.1 Through the acquisition of data and information evaluate, review and resolve problem areas impacting upon the KT function	☐	☐	☐	☐

Appendix 2

Aspects of culture change

The 8 aspects of culture change **IN FIRMS** that we discussed with the interviewees (starting at 1200 on the radar diagrams in Chapter 3) were:

1. Willingness to engage with same partner on a new project.

2. Willingness to engage with a new partner on a new project.

3. Commercialisation process - understanding and working with the HEI way of doing things.

4. Mutual respect - recognising the needs and difficulties of academic life.

5. Intellectual property- recognising the academic constraints on IP exploitation.

6. Increasing trust of the other party and realising relationships are the key.

7. Options – did the firm appreciate that academics can offer other ways of doing things (eg product algorithms).

8. Added value – working with academics is not just money in exchange for IP. Lots of information, views and knowledge is transmitted too.

The 8 aspects of culture change **IN ACADEMICS** that we discussed with the interviewees (starting at 1200 on the radar diagrams in Chapter 3) were:

1. Willingness to engage with the same partner on a new project.

2. Willingness to engage with a new partner on a new project.

3. Commercialisation process - understanding product development, product life cycles and business needs. NOT the HEI commercialisation process.

4. Mutual respect - recognising the commercial issues and difficulties.

5. Intellectual property - realisation that IP is only valuable financially if exploited commercially - and that means risk taken by the partner.

6. Increasing trust of the other party and realising relationships are the key.

7. Goal setting - acceptance that the aim is to be on time, on spec, on budget. Focus on the commercial project.

8. Interest in exploitation – has commercial awareness and interest increased.

O'Herlihy & Co. Ltd.

Appendix 3

Topography of Technology and Technology Translation

The Topography of Technology

O'Herlihy & Co. Ltd.
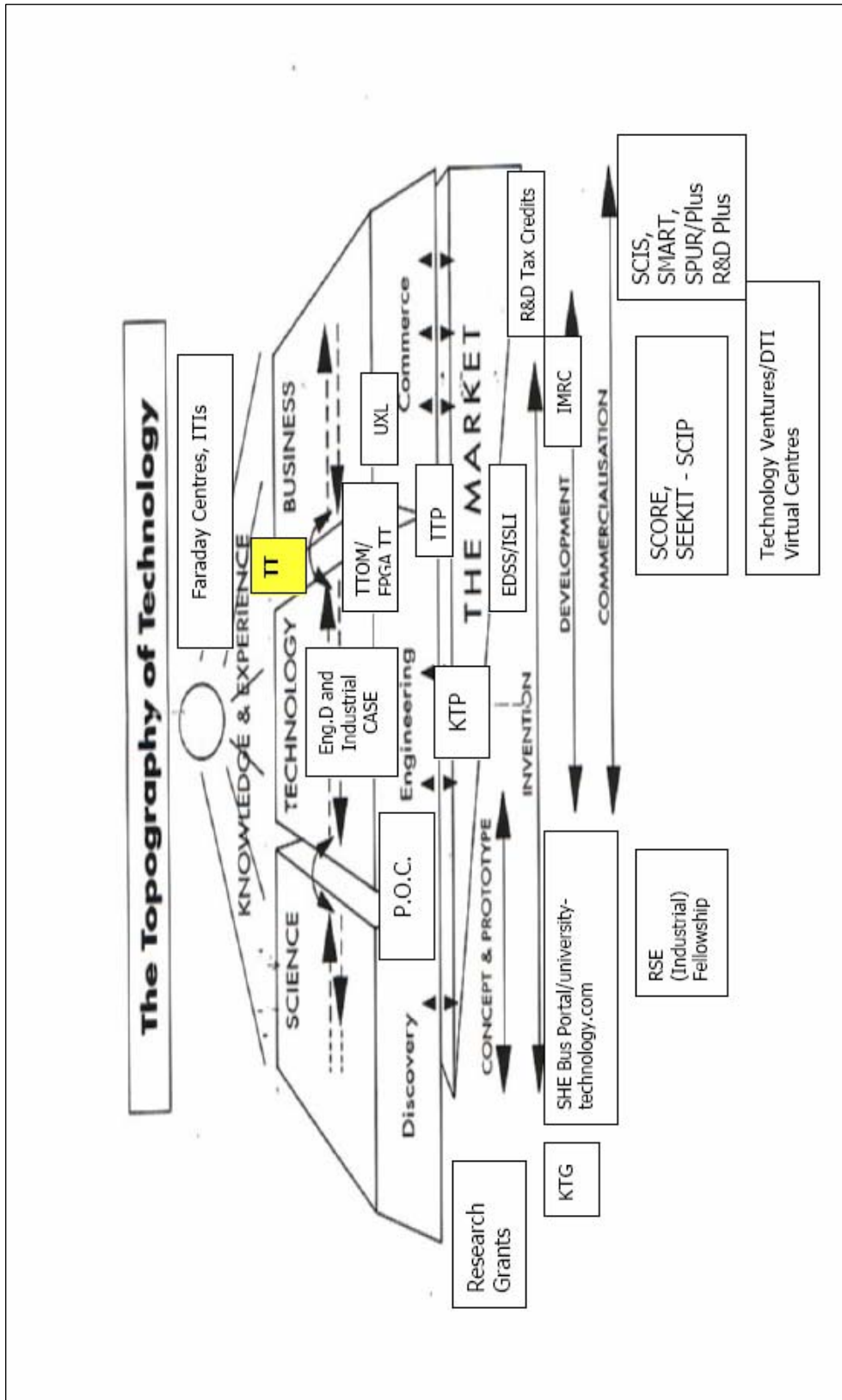
Glossary

CASE	Cooperative Awards in Science and Engineering (Operated by EPSRC)
EDSS	Engineering Design Support Scheme
FPGA/HPC TT	Field Programmable Gate Array/High Performance Computing Technology Translator
IMRC	Industrial Manufacturing Research Centre
ISLI	Institute of System Level Intergration
ITI	Intermediary Technology Institute
ITP	International Technology Promoter
KTG	Knowledge Transfer Grant
KTP	Knowledge Transfer Partnerships
POC	Proof of Concept (Programme)
RSE	Royal Society of Edinburgh
SCIP	Scottish Collaboration
SCIS	Small Collaboration Innovation Programme
SCORE	(Small Medium Enterprise) Collaborative Research
SEEKIT	Scottish Executive Expertise, Knowledge & Innovation Transfer
SHE Bus Portal	Scottish Higher Education/Business Portal
SPUR	Support for Products Under Research
TT	Technology Translator
TTOM	Technology Transfer in Optoelectronics and Microelectronics

O'Herlihy & Co. Ltd.