R&D Discussion Paper #1

DEVELOPMENT OF COLLABORATIVE RESEARCH LINKAGES

Professor Margaret Sheil
Pro Vice Chancellor (Research)
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University of Wollongong has built a strong research reputation and performance underpinned by a variety of factors, many of which will be addressed in the broader discussion paper on research strengths and planning currently under preparation. There is one critical aspect that needs to be addressed with some urgency, however, and that is the extent to which this reputation and performance was built on our capacity to successfully foster and manage collaborative R&D partnerships with industry and other R&D organizations. This success was recognized by the Good Universities Guide award of University of the Year 1999-2000 for Productive Partnerships in Research and Development. Through these partnerships the University was able to both attract research funds directly from industry and to leverage these in competitive external funding schemes, in particular the ARC Strategic Partnerships with Industry (SPIRT), (now ARC Linkage) scheme and in Cooperative Research Centres (CRCs). For example, we played a leading role in two successful bids in 2000 VIZ the CRC for Smart Internet Technology (CRC SIT) and CRC for Railway Engineering and Technology which in each case involved industry partners where we had initially developed strong partnerships via the SPIRT scheme.

Our recent performance in the ARC SPIRT, now ARC Linkage, Scheme is summarized in table 1. The data highlight a significant drop in the number of applications and a drop in associated income in 2002 and in the first round for 2003; this paper addresses the reasons behind this downturn and proposes a coordinated strategy to address this.

Table 1.1 UoW Performances in ARC SPIRT and Linkage Schemes

<table>
<thead>
<tr>
<th>Year</th>
<th>Total ARC $'s for the first year</th>
<th>UoW $'s won for first year</th>
<th>Nat %</th>
<th>Rank</th>
<th>No. apps Nat.</th>
<th>No. apps UoW</th>
<th>UoW %</th>
<th>No. successful Nat.</th>
<th>Nat. % suc rate</th>
<th>No. successful UoW</th>
<th>UoW % suc rate</th>
<th>Nat. % suc rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>$18,138,513</td>
<td>$844,843</td>
<td>5%</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1998</td>
<td>$17,891,483</td>
<td>$992,291</td>
<td>6%</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1999</td>
<td>$17,490,832</td>
<td>$996,722</td>
<td>6%</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td>$19,604,220</td>
<td>$921,108</td>
<td>7%</td>
<td>6</td>
<td>982</td>
<td>47</td>
<td>5%</td>
<td>441</td>
<td>44.9</td>
<td>21</td>
<td>5%</td>
<td>44.7</td>
</tr>
<tr>
<td>2001</td>
<td>$22,131,862</td>
<td>$1,297,083</td>
<td>6%</td>
<td>4</td>
<td>1085</td>
<td>40</td>
<td>4%</td>
<td>484</td>
<td>44.6</td>
<td>27</td>
<td>6%</td>
<td>67.5</td>
</tr>
<tr>
<td>2002</td>
<td>$25,788,368</td>
<td>$1,043,303</td>
<td>4%</td>
<td>6</td>
<td>910</td>
<td>33</td>
<td>4%</td>
<td>462</td>
<td>50.8</td>
<td>19</td>
<td>4%</td>
<td>57.6</td>
</tr>
<tr>
<td>2003 R1</td>
<td>$19,067,349</td>
<td>$175,009</td>
<td>1%</td>
<td>24</td>
<td>662</td>
<td>11</td>
<td>2%</td>
<td>325</td>
<td>49.1</td>
<td>5</td>
<td>2%</td>
<td>45.5</td>
</tr>
<tr>
<td>2003 R2</td>
<td>$809,731</td>
<td></td>
<td>2</td>
<td>580</td>
<td>23</td>
<td>4%</td>
<td>261</td>
<td>45</td>
<td>18</td>
<td>7%</td>
<td>78.3</td>
<td></td>
</tr>
<tr>
<td>2003</td>
<td>$984,740</td>
<td></td>
<td>3%</td>
<td>586</td>
<td>47</td>
<td>23</td>
<td>4%</td>
<td>67.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For clarification, the above funding is for 1st year funding only.

There are three main types of applications within the ARC Linkage Scheme.

Table 1.2 Types of ARC Linkage applications

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Cash</th>
<th>In kind</th>
</tr>
</thead>
<tbody>
<tr>
<td>APA(I)</td>
<td>PhD stipend</td>
<td>$5K</td>
<td>$5K</td>
</tr>
<tr>
<td>APD(I)</td>
<td>Postdoc (identified)</td>
<td>$10K</td>
<td>$10K</td>
</tr>
<tr>
<td>Project</td>
<td>Project costs including research associates or assistants.</td>
<td>20% of total</td>
<td>Combined with cash to give matching $ for $ with ARC Funds</td>
</tr>
</tbody>
</table>

All three types can be combined in the one application.
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Table 1.3 Selection Criteria for ARC Discovery and Linkage Project applications

<table>
<thead>
<tr>
<th></th>
<th>ARC Discovery</th>
<th>ARC Linkage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investigator Track Record</td>
<td>40%</td>
<td>20%</td>
</tr>
<tr>
<td>Significance and Innovation</td>
<td>30%</td>
<td>25%</td>
</tr>
<tr>
<td>Approach and Training</td>
<td>20%</td>
<td>20%</td>
</tr>
<tr>
<td>National Benefit</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>Commitment from Industry Partner</td>
<td>25%</td>
<td></td>
</tr>
</tbody>
</table>

3 Why the Downturn?

Determining the way forward must be underpinned by an understanding of the various factors that have lead to the downturn in our performance in the ARC Linkage Scheme.

3.1 Loss of Industry Partners

- A number of our former partners are now involved in CRCs.\(^1\)
- The global downturn in the ICT industry.
- The merger of BHP Billiton and subsequent spin out of BHP Steel which has a more focused agenda and fewer funds available to support long term R&D.
- Changes in research priorities for some partners such as Australian Superconductors.
- Interest in the scheme from some industry partners has diminished because of difficulties in attracting high quality students.

3.2 Staff Changes

- Loss of research staff from the University who had performed well in this scheme;
- Reduction in available time of other key performing staff, through promotion and involvement in CRCs.
- Appointment of new staff, especially at senior levels, who lack experience in developing new industry partnerships with consequent lack of leadership in developing new collaborations.

3.3 Changes to the ARC

- Grants are now assessed by discipline-based Expert Advisory Committees (EACs) rather than a separate committee that assessed SPIRT grants separately.
- There is more variation in interpretation and emphasis between different EACs and considerable variation from those criteria emphasised by the SPIRT committee.\(^2\)
- The decision to go to two ARC Linkage rounds from 2002 inevitably resulted in a temptation to “put off” proposals to the next round when the time lag is only 6 months rather than a year as previously. It is not clear why this has impacted on UoW differentially except it has simply been aggravated all the other negative factors outlined above.\(^3\) In round one we put in 11 applications and in round two 23 a total of 34, which as you can see from Table 1, is down on the number submitted in 2000 and 2001.
- A further change implemented by the ARC is the removal of the category of APA(I) only applications that were originally designed to be simpler and which they had initially indicated would be assessed more rapidly. This did not eventuate and indeed for 2003 there is now no distinction between the efforts required to apply for an APA(I) only compared to a full project grant.

3.4 Other Issues

As with all major funding schemes the Office of Research widely advertises the ARC Linkage Scheme and arranges seminars and information sessions to promote it. However, one could argue that all these activities rely on having a receptive audience, i.e. individuals who are already thinking about the scheme. The Office of

\(^1\) For example, we had a number of SPIRT grants with the NSW Rail which is a key player in the CRC RET and we have had both substantial direct funding and a number of SPIRT grants with Motorola and Telstra, both of which are key partners in CRC SIT and no longer directly fund Linkage grants.

\(^2\) The SPIRT Committee had strong representation from industry and other non industry areas, whereas the EACs typically have only 1-2 out of 12 members who are not from Universities and thus there is a strong chance that particular applications can be assessed with no input from representatives of industry. Inevitably and to our detriment, EACs decisions are more heavily reliant on the track records of the CIs rather than the potential outcomes.

\(^3\) The value of having a “deadline” was evidenced by the impact of the ARC setting for the two Key Centres, which did result in a determined strategy to seek partners and submit applications to this scheme.

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Research also organizes for review of applications and provision of advice drawing heavily on experienced readers in particular Prof. Peter Robinson, experienced EAC members and the Statistical Consulting Service. The Office also manages an Internal New Partnership scheme to facilitate the establishment of links between industry and researchers on campus.

- There was a period of intense emphasis prior to the second round in 2002 that saw an increase in the number of applications and this produced an excellent result for that round. Experienced individuals such as EAC members and Faculty Research Committee Chairs have also emphasized the scheme when an opportunity arises, but otherwise there has been no coordinated strategy to encourage and mentor individual researchers who may not have considered applying to the scheme.
- Part of our early success in the schemes involved securing APA(I)s and indeed these represent the most viable entry point into the scheme since the funds required from industry are only $5K per year. However, a downside of applying for APA(I)s only is that this ties the researcher into finding a student to work on the project. In many cases, particularly in some areas of Informatics and Engineering where we have had good success with APA(I)s we have been unable to capture the benefit because of the difficulty in attracting suitable students.
- Industry linked research may be more demanding in terms of industry requirements, more development orientated and sometimes less interesting, and not always designed to lead to publications, all factors which are disincentives to researchers investing the long lead time in developing partnerships.
- The potential impact of utilizing other linkages has not been addressed in a strategic way. For example, the impact of leveraging suppliers or can we leverage activities of ITC with say NGOs to develop new partnerships?
- It should be recognized that researchers often raise the issue of significant travel costs being a significant disincentive associated with developing new partnerships. This may in part explain, why only well funded Institutes (viz. TITR, IPRI) have historically devoted resources to such activities. This is particularly the case for researchers from the Humanities and Social Sciences where there is not a pool of existing funding from which to invest in new developments.

3.5 Impact of CRCs

While there is no doubt that the two CRCs won in 2000 (SIT and Railways) have had consequences for our success in ARC Linkage Schemes, this should be viewed as a successful outcome of the partnerships developed via the scheme. Effectively moving our partners into CRCs has created a secure and larger funding stream for these activities for an extended period i.e. 7 years. This is particularly important in the case of SIT, as it could be argued that the decline in the IT industry would have resulted in the loss of these partners.

Further, the CRCs have had more success in attracting students than has been the case with individuals trying to attract students for APA(I)s, albeit attracting quality domestic students remains a significant issue in some areas of Science and Engineering regardless of the funding scheme. There are several caveats to this.

- CRC Income carries the same weight as ARC funds in the IGS and RTS formulae but does not add to our Research Infrastructure Block Grant (RIBG) and there is a significant infrastructure cost associated with CRCs where the CRC does not pay an appropriate overhead. For example, the School of Electrical and Telecommunications Engineering has the equivalent of 6 out of 18 academic staff committed to CRCs in kind. The School has ~ 10 CRC funded research fellows for which it has to provide basic infrastructure (phones, email, workshop facilities) without concomitant compensation. A similar argument could be mounted in some of the schools in Engineering.
- CRCs have rigid governance and management requirements representing a considerable cost in time for both senior staff and staff in the Office of Research and Personnel and Finance. For example, the PVC(R) spends at least one day per month on the CRC SIT of which she is a member of the Board, and Professor Robinson spends a similar amount of time on each of the remaining three CRCs.
- Little attention was given to identifying and developing new opportunities for partnerships to backfill the gap created by the entry into these two CRCs and to lay the groundwork for future CRCs.
- Despite the above, if we are not involved in the next round of CRCs there will be further new funding introduced into the sector from which we have not gained a share, thereby impacting further on our share of the sector-wide research income.

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4 Our only current EAC member is Don Iverson (Social and Behavioural Sciences). Former members include: Peter Robinson (Engineering and Environmental); Ah Chung Tsoi (Mathematics, Informatics and Communication); Margaret Sheil (Physics, Chemistry and Geosciences) and Rob Whelan (Biological and Biotechnology).

5 To be eligible for an APA(I) the student must be an Australian citizen or permanent resident.

6 This is borne out by the recent downturn in at least one of the industry partners in the CRC which has resulted from their withdrawing from all current Linkage grants excluding the components that relate to PhD student support.
3.6 Impact on HDR Students

Since the ARC Linkage grants typically include an APA(I), increasing our success in this scheme should have a concomitant benefit in terms of numbers and quality of HDR students, which in the long term is important for maintenance of HDR domestic load. There are a number of issues in this respect that need to be considered.

- **Attracting Students to IT, Engineering and Science**
  Given that in areas of IT, Engineering and Science (eg. IPRI) where we have had good success with obtaining APA(I)s the impact has been partially diminished by failure in some cases to attract strong candidates, there needs to be a strategy to attract students to take up these scholarships. Therefore a parallel strategy should involve working with Uniadvice to recruit such students to these areas. Enhancing the prospects of attracting a good student should be a key driver for academics in these areas to seek APA(I) funding.

- **Attracting Scholarships for the Humanities, Creative Arts and Social Sciences**
  In contrast, the Humanities, Education, Creative Arts and Social Sciences typically have a larger pool of research students than there are scholarships available. This is particularly the case because students who have not followed a traditional career path are frequently attracted to these areas but have difficulty competing against recent Honours graduates for scholarships. Again, the opportunity to provide funding for quality students in areas of interest to the academic should be a key driver for academics in these areas to seek APA(I) funding. Further, because there is less emphasis on track record in the ARC Linkage scheme compared to Discovery there may be opportunities to leverage researchers in these areas into the “ARC system” via this scheme. Investigation of mechanisms to provide resources to develop partnerships in these areas, which have to date been largely untapped, need to be part of our strategy. Examples include the high powered CAPTRANS advisory board that has frequently offered to assist in identifying potential linkage partners, links to NGOs that could be introduced via ITC, and exploiting our extensive networks in the local region. Trying to develop opportunities for researchers in these areas has the further benefit of that researchers in these areas do not have the same commitments to existing projects and Centres as is the case with researchers in science, engineering and IT.

3.7 Other Opportunities and Strategies

There is a cohort of enthusiastic new staff with strong track records who should be fostered and encouraged to use the ARC Linkage scheme as an entry point to other opportunities. All have heavy teaching loads associated with developing course material as new academics and other factors such as the need to do ITT that impact on the time available for developing linkage proposals. Thus it might be productive to set aside a pool of funds to provide teaching relief for these staff specifically to enable them to devote the time to developing Linkage projects, in conjunction with identifying potential partners.

We have not encouraged in a coordinated way, opportunities for Research Fellows and self funded Research Units to apply for Linkage projects. By way of an example, the Centre for Health Services Development has an extensive network where there may be opportunities to develop Linkage projects, particularly for researchers in say commerce, who could be associated with Centre projects. Again, because CHSD staff are fully committed to projects that earn income we may need to provide funding to the Centre to free up staff time to undertake these activities.

3.8 The Competition

A number of other Universities have created one or more positions either within their Offices of Research or reporting directly to the Vice-Chancellor to undertake a vital support role in developing industry partnerships that in most cases is distinct from and separate to staff devoted to both grant management and processing within OofRs and commercialization and business development functions.

Griffith University has a linkage development person within the OoR (level 10) who is dedicated to this task and a separate higher level director of the Office of Commercialisation. The University of Sydney has done the reverse and taken the administration and development of ARC Linkage grants away from its large Business Development Office and given the responsibility to the OoR. This was part of a concerted strategy to improve their success in ARC Linkage Schemes which had immediate results in 2002. This is supplemented by the former director of the UNSW OofR having a “roving role” actively encouraging individual researchers to apply for grants.

At UNSW they have appointed a L9 for six months in the OoR and some schools pay grant writers, based on a success fee, to assist researchers directly on developing Linkage project applications.

Macquarie University has appointed two Industry Liaison Officers located within the two high performing faculties but reporting directly to the Vice-Chancellor.
4 The Way Forward

Identification and development of new industry and other partnerships requires a concerted and coordinated effort to conduct the “market intelligence” to identify industry and other partners and to undertake the liaison and follow up to arrange meetings between researchers and potential partners to ensure there is no loss of momentum once promising contacts are identified. Current staff within the Office of Research are fully committed in managing and processing grants, students and contracts and there is no spare capacity to devote to this activity. Similarly, academics generally do not have the time to conduct the intelligence and do the necessary follow up, but the time of key academics could, and would need to, be used productively in developing research proposals once the potential partner contacts are identified.

Thus it is proposed to create a new position tentatively titled as Research & Development Executive Officer. The person would work with the VC and PVC(R), Prof. Peter Robinson, the Director of the Office of Research, Deans and Key Research Leaders to coordinate Research Partnership Development activities. The position would also be involved in the identification of potential partnerships for the Innovation Campus.

Specific Actions and Preliminary Timetable

<table>
<thead>
<tr>
<th>Action</th>
<th>Who</th>
<th>Timeframe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appoint Development Officer</td>
<td>PVCR/VC/Director OoR</td>
<td>Late June</td>
</tr>
<tr>
<td>Identify Potential Researchers</td>
<td>Deans/Associate Deans</td>
<td>Mid June</td>
</tr>
<tr>
<td>Information Session for December round</td>
<td>Research Grants Manager Development Officer</td>
<td>July</td>
</tr>
<tr>
<td>Identify list of possible partners</td>
<td>Deans/Institute Directors/PVCR/VC/Peter Robinson……coordinated by Development Officer</td>
<td>July</td>
</tr>
<tr>
<td>Development of strategies to attract quality students</td>
<td>Research Student Manager/Uniadvice</td>
<td>July-September</td>
</tr>
<tr>
<td>Meetings/follow up/making linkages/facilitating workshops</td>
<td>Development Officer/ Potential Applicants/Key Senior Staff as appropriate</td>
<td>July-October</td>
</tr>
<tr>
<td>Workshop for December round</td>
<td>Research Grants Manager Development Officer</td>
<td>August</td>
</tr>
<tr>
<td>Follow up potential applicants/start preparing applications</td>
<td>Development Officer/ Research Grants Manager Potential Applicants/Key Senior Staff as appropriate</td>
<td></td>
</tr>
<tr>
<td>Applications Submitted</td>
<td>Individual Applicants</td>
<td>November</td>
</tr>
</tbody>
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