

IBM response to the Lambert Review on Business-University Collaboration

1) Summary

1.1 IBM UK experience with universities respecting collaboration and recruitment is generally satisfactory, reflecting the quality of partners selected, mutual personal investment, identification of win-win opportunities and long-term engagement. Though we have little interest in University joint ventures and shared intellectual property, we value highly our long-term comprehensive relationships with certain top UK universities and our connections with many others.

1.2 As a technology-led company, IBM naturally regards relationships with leading universities as important. It therefore warmly welcomes the opportunity to respond to Richard Lambert's HM Treasury enquiry. This reply can however hardly begin to address all the questions in the request. In anticipation that this response could give rise to some specific supplementary questions, IBM would welcome the opportunity to give oral evidence.

1.3 Two web sites containing relevant background information are www.ibm.com/university and www.ibm.com/research.

2) Context

2.1 IBM is a global business which seeks to lead in the invention, development and manufacture of the IT industry's most advanced information technologies, including computer systems, software, storage systems and microelectronics. We translate these advanced technologies into value for our customers through our professional solutions, services and consulting businesses.

3) IBM Research

3.1 IBM spends around \$5 billion a year on research and development, inter alia filing more than 3,000 patents a year. It makes a clear distinction between development and research. Across the world, eight laboratories employing 3,000 people specifically engage in research, continuing a distinguished record of discovering many of the IT industry's most important technologies. Among them is Zurich, the only European Research site, the largest of its kind outside the US and still home to two of its original four Nobel laureates. year.

3.2 As an example of a major research programme of current relevance to the UK, please refer to the evidence taken by the recent House of Lords Science and technology sub-committee on microelectronics from IBM in Almaden and London.

4) IBM University Relationships

4.1 Across the world, IBM Research has significant collaborations with well over 100 universities, and less intensive connections with many more. What IBM Research looks for is access to the know-how in universities, sometimes in the form of help in solving on-going problems (i.e. leveraging limited resources), but more often as a way to keep abreast of new developments.

4.2 It follows that most of these collaborations tend to be of an exploratory nature, with world leaders. Several UK universities qualify almost across the board. Others have pockets of international excellence. It follows from the foregoing paragraph that at any time there will be relatively few substantial UK university relationships with IBM. As a general rule, money transfer does not feature highly. Also, though there are opportunities for scientists to take 3 to 12 month sabbaticals on campus, Research prefers its scientists to work inside IBM labs.

4.3 **Complementary and collaborative research** is just one of four particular interests IBM has in the university sector. The others are: **recruitment of more of the best first degree, doctoral and MBA graduates; improved student and academic familiarity with IBM products; and increased profitable sales of IBM products and services.** During the turbulent '90s, IBM's traditionally strong university relationships in all these areas slipped. In 1998, concerned at this, IBM's then chairman Lou Gerstner personally launched a pro-active, co-ordinated approach to university relations, with particular emphasis on attraction of top technical talent.

4.4 On the premise that a well-organised whole can be stronger than the sum of the parts, a Corporate Director for University Relations co-ordinates these separate line-of-business interests, world-wide At national levels,

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Country General Managers oversee their key national university partnership relationships. With country-level support, these are led by senior executives, typically vice-presidents or similar. They maintain regular contact with their respective vice-chancellors and lead campus teams of keen volunteers and line of business representatives. Over the past five years, seven such partnerships have been launched. Their success is dependant on long-term people-driven relationships. In almost every case both parties are pleased with progress. Only when one or both parties is unable to provide top-down leadership does a relationship falter.

4.5 After people, awards are probably the next most important part of IBM's university relationship programme. Last year, UK universities won a substantial proportion of the world-wide equipment grants made to support key corporate research priorities. These priorities are reset each year: **2003 priorities are advanced business integration, computing infrastructure, deep computing, exploratory computing technology and Linux open source enhancements**. It has been pleasing to see how the UK awards have leveraged significant UK Research Council, OST and EC funding for national priorities.

4.6 Though practicality limits the number of these formal partnerships, IBM in the UK has strong connections with a further twenty universities, with particular interest in recruitment but in several instances significant collaborations in subjects like Grid and e-science. Our experience of the way UK universities relate to IBM is generally favourable, with the principal determining factor what both sides are prepared to put in. The annual **IBM UK Technical Ambassadors Competition** never fails to amaze respecting the way it reveals the extent of IBM voluntary university activity. Across the country, up towards 200 IBMers contribute to University Relations, touching many hundreds of academics and several thousand undergraduates. Further, though we do not track additional one-to-one Research connections, we know these numbers to be very large.

5) General Remarks

5.1 The scope of the Lambert study is too wide for a comprehensive response. So, rather than duplicate much of the opinion expressed in the excellent submission from the Royal Academy of Engineering, many of whose points we endorse, it seemed more appropriate to pick out some particular points reflecting IBM's experience. In general we find that most of the research-driven universities with whom we work are doing as good a job as their constraints afford, with concerns generally related to isolated instances. Association is limited as much by our own resources and needs as by their core mission and capacity to perform.

6) Examples of Best Practice in Business-University Collaboration

6.1 In notably differing ways, and usually moving up a learning curve, we see good practice in each of those seven UK universities with whom we have established long term relationships. To a lesser extent, the same applies in most of the other twenty. An important feature is that **success springs from people rather than money**. Particularly notable is the way strategic research and collaborative development has been promoted in certain universities, including **GRID, e-science, open source and life sciences**. We believe that good complementary collaboration on open source and open standards will benefit our mutual customers. We are particularly proud of the way to which universities have appointed numerous IBMers as voluntary visiting honorary professors, guest lecturers, mentors and advisory board members, though we sometimes feel the last of these could be more effectively used.

6.2 We find that **bottom-up campus presence and one-to-one relationships are vital. So too is top down management involvement**. Each of our approximately 150 university partnership teams across the world is led by a vice-president or equivalent. Regular internal team reviews improve effectiveness and commitment. In the UK, the Country General Manager chairs a bi-monthly meeting of Partnership Executives and relevant line managers. This degree of attention goes right to the top of the company: by way of example the senior vice-president ultimately responsible for university relationships is visiting at least three of our preferred UK universities over the next thirty days.

7) Barriers to Business -University Collaboration

7.1 There are opportunities for the university sector to rationalise **Intellectual Property practice**, including consistency, competence and organising for economies of scale. Nevertheless the best universities are improving the way they organise their **exploitation of applied research**. Notwithstanding recent modest improvements, since academic salaries do not compare well with the private sector, few academics can be expected to have many of the **skills needed to work on industrial exploitation**. We are concerned the threatened further **fragmentation of state-funded research arrangements**, for example the suggestion of a European Research

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Council which would take from the same pot as Framework 6 and the UK Research Councils. In protection of the core roles of excellent research informing teaching, universities should clearly **separate work-for-hire activity from research collaboration.**

7.2 If industry wants academics to act as consultants, such that the resultant IP will be theirs, they should expect to pay a rate commensurate with the passing of knowledge. Full rate would make it quite clear that the client owns the resultant know-how or patents. Below that rate and without prior contracts, universities can expect to become involved in potentially difficult retrospective negotiation. Prior agreements are essential. It would be helpful to all concerned were UK universities to review best commercial practice and then collaborate to derive their own form of model contract.

7.3 Universities need flexible IP management. They must agree in advance whether ownership is sole or joint, anticipating that experienced companies prefer sole ownership for its clarity and avoidance of controversy. Universities also find difficulties when they meet the widespread company practice of cross-licencing. Quite simply, the company model does not map particularly well to university IP practice, not least because the rights of individuals vary across university and within them across departments. Further, they are often under-equipped to handle problems such as commercial relations, time-dependant confidentiality product development, manufacture and customer service. Consequently, such universities have a tendency to over-value their contribution to a joint business venture. Though there are some bright spots, and we work with some excellent Development Offices, there is currently a considerable shortage of university people who understand what it takes to run a business.

7.4 Though most of IBM's UK's recent University IP negotiations have gone smoothly, reflecting competent university officers, a few have not. One such involved protracted and tortuous discussions on Grid, now resolved. Others took time to align the views of the two sets of IP lawyers. One area where IT IP negotiations may not run smoothly is where Open Source and proprietary software are to co-exist. Nevertheless, our overall experience is that sensible discussions between informed representatives usually resolve even the most sensitive of IP problems. Companies such as IBM can also be expected to be willing to help with mentoring.

7.5 In the UK we do very little with Universities respecting IP, with - so far as is known - no current university licence agreements. Whenever and wherever we do engage with them in this way, our preferred policy is to establish sole ownership and then widely cross-licence the outcome. This however is not to say that the matter is of no concern to IBM, not least because we anticipate engaging in several Framework 6 EC consortia including university partners. Coincidentally, **the IBM EMEA IPR community is holding an internal seminar on University agreements on 30th April.** Should the Lambert committee be interested, IBM UK's Senior Patent Attorney would be pleased to give evidence.

7.6 IP-related skills are scarce and expensive. The DTI might consider asking the Research Councils to help. Since they distribute much of the funding, they should complement their interest in assessing how well this is used during the contract with helping exploitation. This might take the form of facilitating web-based and regional IP advisory services., such that the SET research-driven universities could gain from economies of scale.

7.7 **Technology transfer** is a relatively low IBM priority, but where it happens experience is satisfactory.

7.8 It would be our view that the importance of **industrial research collaboration** should be better recognised in the RAE.

7.9 **RDA**s and **LSC**s hardly feature in our business relationships, though we are trying to help them and New Technology Institutes (NTIs) with the challenging task of providing technology skills for SMEs..

8) The supply of skilled graduates to business

8.1 There is widespread evidence that **teaching of much SET** fails to excite students. From the point of the IT industry, there is an impression that 'we'll teach you everything we know, but not things we don't like, such as soft skills'. Universities might consider how they can complement traditional SET activities with novel approaches.

8.2 Generally speaking, **IBM is able to attract good technical graduates.** It does however come as a surprise to many that outside the labs, there are relatively few jobs which specifically require computer science

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qualifications. We are surprised at the disinclination of computer science departments to relate their courses to the large numbers of demanding jobs in the consulting and architecture sectors of the UK IT service industry. Similarly, if electronics is anything to go by, though departments know what industry wants regarding soft skills, they are disinclined to provide them. Small surprise that the long term trend is for students to read something else, though oddly enough many migrate to computer science. Though there is relatively little call for specific knowledge acquired from PhDs, they are valued for their attitude and innate capabilities. .

8.3 Our **experience of Careers Departments** is generally very good, and their resilience when demand can varies sharply from year to year is remarkable. One critical factor is company on-campus presence, particularly students who have previously worked in IBM . Another is the value students place on training aimed at improving job prospects.

8.5 In common with many similar companies, IBM is failing to meet self-imposed targets for **recruitment of women for technical careers**. This is of course a problem throughout the industrialised world. Overall, we believe we can show **good practice in employment practice** and are currently working hard on this difficult problem of attracting technically minded females. We would be happy to share our analysis. Though Universities exert a relatively small influence, too far down the line to make much difference, some could probably do more to change the position if they wished.

8.6 On a wider front, the double whammy of **lack of pre-graduation industry experience** and disappearing UK industrial research and development is adversely affecting inclination, preparedness and opportunity for SET graduates to take up taking up vocational careers. Government and universities should look for innovative ways to work with industry to improve this lamentable situation..

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