

TECHNOLOGY INNOVATION CENTRES

UKCRC Evidence to the House of Commons Science and Technology Committee

Declaration of interests

1. Our evidence covers UK research in computing, which is internationally strong and vigorous, and a major national asset.
2. The UK Computing Research Committee (UKCRC), an Expert Panel of the British Computer Society, the Institution of Engineering and Technology and the Council of Professors and Heads of Computing, was formed in November 2000 as a policy committee for computing research in the UK. Its members are leading computing researchers from UK academia and industry. Our evidence reflects the experience of researchers who each have an established international reputation in computing.
3. The UK has always been exceptionally strong in computing research: the first modern computer was developed at Manchester University and ran its first program in June 1948; since that time, the UK has played a part in almost all the scientific and engineering advances in computing. Computer systems have transformed modern life, but the world is still in the early stages of discovering, inventing and exploiting its full potential. UK computing research remains world-class¹, and is a national asset that enhances the UK's international prestige, attracts inwards investment, and supports innovation for wealth creation and improved quality of life.
4. Computing is at the heart of almost every Government policy because almost every such policy requires new, and usually very complex, IT systems.

What is the Fraunhofer model and would it be applicable to the UK?

5. The Fraunhofer Society is a collection of 59 Institutes in Germany, each institute being responsible for a particular area of applied research. The funding model for these Institutes has one third of income coming from government and the remaining two thirds coming from contract research derived from industry and the public sector. The 2009 Annual Report states: "... more than €1.3 billion is generated through contract research. Two thirds of the Fraunhofer Gesellschaft's contract research revenue is derived from contracts with industry and from publicly financed research projects. Only one third is contributed by the German

¹ This has been confirmed by successive EPSRC International Reviews, the latest of which reported in 2007.

- federal and Länder governments in the form of base funding, enabling the institutes to work ahead on solutions to problems that will not become acutely relevant to industry and society until five or ten years from now”.
6. The Fraunhofer Institutes employ approximately 17,000 staff, mostly qualified scientists and engineers. Institutes working in related areas form Fraunhofer Groups. Current groups are (i) Information and Communication Technology (ICT), (ii) Life Sciences, (iii) Light and Surfaces, (iv) Microelectronics, (v) Production, (vi) Defense and Security, and (vii) Materials and Components.
 7. The ICT Group claims to be largest ICT research group in Europe, and “serves as a one-stop shop for industrial customers and media enterprises”. Identified business areas within ICT include (i) digital media, (ii) e-business, (iii) e-government, (iv) communications systems, (v) energy and sustainability, (vi) medicine, (vii) production, (viii) Security, (ix) financial service providers, and (x) automotive.
 8. Patent license revenue was €78M, the majority of which is derived from the patents relating to the MP3 audio coder/decoder (e.g. MP3 players such as the iPod), the most common digital audio file format. We note that patent licensing does not provide a significant portion of the Fraunhofer budget.
 9. The Fraunhofer Institutes now include international collaboration, including the location of Centres and Offices in Europe, Asia, the USA and the Middle East.
 10. The UK has traditionally had a reputation for excellent research, but a poorer reputation for commercialization of this research. This has been long recognized and a number of initiatives have been introduced to address this issue. A Fraunhofer-like model would offer another means to address this issue.
 11. We note that compared with Germany, the UK is weaker in manufacturing and stronger in applied ICT and services. The UK has a greater need for export-led growth, and there is therefore a need for an even stronger linkage with businesses capable of applying ICT.

Are there existing Fraunhofer-type research centres within the UK, and if so, are they effective?

12. The Hauser Report identified a number of Fraunhofer-type research centres in the UK, including the Manufacturing Technology Centre at Ansty, and the Advanced Manufacturing Research Centre. We are unaware of any such centres related to ICT. The Hauser Report identifies MediaCityUK as an example of a sector/market focused example of a Technology Innovation Centre (TIC) in the UK. However, while MediaCityUK offers a “purpose built home for creative and digital business”, i.e. it is a property development, it does not provide a funding mechanism for applied R&D.

13. The Hauser Report also correctly identifies the lack of a national strategy, national coordination, and unified branding. Moreover, because existing centres are funded from a variety of sources with different agendas, “[t]here is currently no overall framework of criteria and metrics for measuring the performance of TICs in the UK, and to assist in the benchmarking of their performance”.
14. We note that the TSB and other organisation have traditionally funded projects, and such a funding model is not suitable for establishing R&D institutes.

What other models are there for research centres oriented toward applications and results?

15. The UK’s universities have a significant effort directed towards technology transfer. However, this capability seldom extends beyond technology readiness level (TRL) 4, i.e. validation in laboratory environment. It is rare to include validation in a relevant environment, and prototype demonstrations.
16. The Media Institute is a model being established by a number of London Universities to create a Technology Innovation Centre for the UK’s Media Sector. The Institute’s researchers will be seconded from universities. This has the advantages of (i) no career disruption, (ii) guarantee of regular employment of fresh researchers with expert knowledge of specific, identified, industry issues, (iii) little or no competition in funding from Research Councils, (iv) close cooperation between the Institute and UK universities, and (v) ability to engage Ph.D.s in Institute research. Foreground IPR will be owned by the Media Institute and used as a means to quantify key performance indicators and to defend UK industry. The business plan specifically omits IPR licensing revenue to ensure a focus on public intent to promote national growth.

Whose role should it be to coordinate research in a UK-wide network of innovation centres?

17. The Technology Strategy Board (TSB) ‘s role is to “stimulate technology-enabled innovation in the areas which offer the greatest scope for boosting UK growth and productivity. We promote, support and invest in technology research, development and commercialisation. We spread knowledge, bringing people together to solve problems or make new advances.” As such, it seems very well placed to coordinate and manage a UK-wide network of innovation centres.
18. However, the Fraunhofer model includes a core stream of 33% of income where such centres conduct basic research, even if such basic research is application-oriented. This overlaps with the remit of the UK Research Councils (UKRC). It is imperative that the respective Research Councils coordinate and manage such research. Moreover, funding for any Fraunhofer-based centres should not reduce funding for basic research, nor reduce the funding available to the UKRCs for fundamental research.

What effect would the introduction of Fraunhofer-type institutes have on the work of Public Sector Research Establishments and other existing research centres that undertake Government sponsored research?

19. If “public sector research establishments” refer to, for example, NPL, AWE, Culham, and Dstl, we do not expect to see any affect with regard to ICT.
20. However, if “public sector research establishments” refer to UK universities, any effect would depend very much on the mission of such institutes. As stated above, the current Fraunhofer Institutes allocate approximately one third of their budget to “enable the institutes to work ahead on solutions to problems that will not become acutely relevant to industry and society until five or ten years from now”. This mission has considerable overlap with that of existing UKRCs. Great care should be taken to ensure that long range research remains under the control of the UKRCs and is not dispersed across other organizations.
21. The German Fraunhofer Institutes receive two-thirds of their income from contract research. This funding is a mixture of both public and private contract research. It is possible that Fraunhofer-like institutes could be in direct competition with UK universities for funding.

Evidence

22. UKCRC would be pleased to provide further detail of any of the issues raised above, either in writing or by way of oral evidence.

Evidence submitted by Ingemar J. Cox on behalf of UKCRC, December 2010.