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Technology and Innovation Centres

A Response to the Prospectus from the Technology Strategy Board (January 2011)

by AIRTO

AIRTO PAPER 11/1   **February 2011**

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1   Introduction

AIRTO is the Association of Independent Research and Technology Organisations. The core of our membership is the research associations that were established after both World Wars but today we embrace a range of organisations that operate in the intermediate research sector which contributes over £3bn to UK GDP and supports over 60,000 jobs. Our members are already involved with many of the activities and technologies identified for the Technology and Innovation Centres (TICs).

AIRTO members are technology and sector specialists with extensive understanding of technology supply chains and are ideally placed therefore to respond to the Prospectus on the subject of the technologies forecast to be of strategic significance to the UK and therefore the choice of focus for the TICs. This response from AIRTO itself will therefore concentrate on providing feedback on the generic aspects of TICs.

2   Rationale

AIRTO has long argued for a UK equivalent of the technological support infrastructure represented by the Fraunhofer Institutes in Germany. This would address a long standing problem with the UK's underperformance in converting world class research into economic growth. We therefore welcome the attempt at strategic and structural reform of the innovation system that the TICs represent.

In recent years, much attention has been placed on improving the relationship between universities and industry. Whilst this is laudable, it has led to other important aspects of the innovation system - and the organisations within it – being somewhat ignored. Adding dedicated research and enterprise resources to universities achieves a measure of success, but struggles to address several important aspects of the challenge, particularly where collaboration and partnership between multiple parties (including industry to industry) is concerned. More extensive support is particularly required to:

- Match demand side pull from business and industry with scientific and technological expertise – *wherever it exists.*
- Co-ordinate access for industry to *multiple* sources of scientific and technological development.
- Proactively stimulate collaborative enterprise and foster technology development.
- Make available a full spectrum of specialised skills and support at every stage of the journey from research through innovation to successful commercialisation.

3   Consistency and Continuity

TICs are not of course the only attempt there has been to address such challenges. A previous attempt to emulate Fraunhofer style institutes gave rise to the Faraday Partnerships in the 1990s. We need to acknowledge and learn from the mistakes that were arguably made during the establishment of these partnerships which started up very unevenly. The Faraday Partnerships were characterised by inconsistent models of operation, governance and financing which ultimately led to their demise – as least as a coherent movement.

A clear, shared vision for what each TIC is trying to achieve is crucial, and this must remain in place for a good period of time. We need to be aware of "mission creep" and actively avoid it. This can only be achieved through strong political and strategic leadership – in the first instance on the part of the Technology Strategy Board (TSB) which must work hard to set up the appropriate terms of reference and success criteria. TICs will most probably come under pressure to address a variety of national,

regional, technological, socio-economic and even global goals. It is very important to keep in mind that it is *economic growth* in the UK that justifies the investment.

We already have some concerns that the original thinking behind TICs is becoming diluted or even compromised as groups with particular interests and needs become involved and the practicalities of establishing TICs are realised. It is vital not to lose sight of the vision – and mission – for TICs, which was presented as helping the UK win market share of emerging technology markets in areas where it had some existing strategic advantage. If they lose focus during the implementation phase it will be difficult for them to achieve their primary objective and for them to have mutually beneficial relationships with other centres, networks and organisations. It is also critical that this new initiative is well managed and maintained over time, because it will take several years for the true economic benefit to emerge.

4   The Funding Model

In principle we agree that a mixed funding model will be appropriate for TICs although the exact ratios between various sources might vary according to the focus of the Centre, the requirement for investment in infrastructure and so on. However, there are once again lessons to be learned from previous initiatives. For example, when the ring-fenced research money was exhausted, the Faraday Partnerships were directed to apply through normal research grant application processes to be peer-reviewed competitively, along with the main body of university researchers. This ultimately led to conflicts of interest between what was required to obtain core funding – and what industry wanted to pay for.

Governments have repeatedly tried to make innovation initiatives and centres such as these financially self-sufficient. This inevitably changed their business models, for example away from generic research serving the national interest and working with small and medium sized enterprises (SMEs) - towards services and less risky work for larger enterprises worldwide, thereby moving them away from the purpose for which they were established. The core funding element must be maintained in a consistent fashion to anchor each Centre in a strategic role serving the national interest with an activity plan that is not deflected by disproportionate pressures from short term financial imperatives. If the mission is prematurely abandoned, all we will have done is set up another small group of SMEs.

It is worth noting that AIRTO members have for many years been successfully operating mixed funding models and managing and responding to the needs and interests of different stakeholders that such funding dictates. The value of their experience in such matters should not be underestimated. TICs need not be a breed apart, but should be positioned as an additional vehicle for funding innovation, alongside Knowledge Transfer Networks, Innovation Platforms, collaborative projects and so on. TIC status provides the funding that allows an organisation to undertake work that supports the national strategy.

5   Positioning in the Innovation System

The innovation system in the UK is undoubtedly complex, but this should not simply lead to a conclusion that it is also ineffective. AIRTO members alone constitute a considerable resource, and together with public sector research establishments, universities and privately formed research organisations, comprise a significant network of technologically highly skilled resources across the UK. A number of bridges have been built between these different parts of the system in recent years, and TICs must take care not to sweep away the good work that has been done in this respect.

The Technology Strategy Board must recognise and seek to add value to the existing innovation landscape. The new Centres must fill gaps in what is currently available from the networks of existing organisations, otherwise there will duplication of the expertise and support that is already available to industry as well as unhelpful competition for scarce funds. The TICs must link with and utilise this existing expertise and capability, both up-stream to additional sources of innovation and research and downstream to new business and industrial constituencies in a hub and spoke model, to deliver new outcomes that cannot currently be achieved. Although the funding should *not* be used simply to continue what's already being done, existing players could and should be allowed to become TICs. Completely new organisations should only be formed where there is no obvious organisation in the

technical area. Existing organisations should be given the chance to transform themselves into, or assist in the operation of, TICs where this is appropriate; it may well be the most cost effective route to the desired outcome.

6   Ownership and Governance

Governance could be based on a number of alternative models. AIRTO members embody several of them. However, particularly when trying to bring something new, like the TICs, into existence, it's important to keep clear of vested interest and to avoid suspicion between potentially competing stakeholders. The model that generally works best in these circumstances is the Company Limited by Guarantee (CLG). Whatever the preferred model – this is another area where consistency and clarity should be pursued from the outset to avoid a confusion of approaches (and subsequent waste of resources). The movement will soon lose credibility with industry partners and other stakeholders if every TIC is allowed to establish itself on a different basis, with the potentially conflicting sets of drivers that come with each structure.

7   Operations and Services

Industry wants TICs to be able to understand and analyse their problems, source the science and technology from the best available and assemble it as a solution. To facilitate this there may well be staff from a variety of different organisations taking part and this makes for a compelling argument for TICs to be independent of a particular university or universities (for example), so that they can go to as many world leading scientists as necessary. Centres should look to strong international networking as well as strong connections in the UK. This approach also permits greater choice of geographical location. Perhaps the most sensible place to locate a TIC hub is within a concentration of the industry that it will serve.

Demand pull and technology push need to work together to deliver the TICs' mission. Some Faraday Partnerships successfully brought industries together to articulate their needs. That was the pull. Academics were brought together, in the same meeting, to describe where their research was going. That was the push. Partnership staff then facilitated consortia to take forward work of common interest. Without push, opportunities for innovation will be missed; without pull, technology may be developed for which there is no customer. SMEs were brought in by ensuring that large enterprises (their potential customers) were present. The facilitation skills to join push and pull are key. It is important for TICs to be open to all sources of invention and innovation; although universities contribute a lot, many more innovations come from industry itself. This too needs TIC support, across the many players in the supply chains, calling on university science where needed. A variety of open innovation models will need to be pursued.

There are a number of other important roles for TICs. One is helping to incubate and attract investment to SMEs aiming for rapid growth. Another is helping companies access European funding, through Framework Programmes for instance. Intellectual property needs careful handling and there remain major differences in approaches between various parties. For example, formalised invention disclosure procedures are increasingly being used in universities and elsewhere, helping to determine when and what to patent (and what not to patent) and there is exchange of best practice between AIRTO's members and universities and between the universities themselves. TICs can reach out across the cultural bridges, between universities and small businesses in particular. This is a good reason for positioning and equipping the TICs to serve as brokers in such matters.

8   Technology Areas

We welcome the policy adopted by Government and implemented through the TSB to direct resources to where they are likely to have most strategic impact. It is only on this basis we believe that the UK will be able to compete globally and it reflects the policies and approaches of other countries that are emerging as our competition in the knowledge economy as well as in more traditional sectors.

The TSB is in the best position to determine, recommend and implement such choices and must provide strong leadership at this time to avoid the potential dilution of effort and purpose. The TSB must continue efforts to map the capabilities that already exist and to identify, against the UK strategic needs, what of the current capabilities can form the starting point for TICs and what is missing.

AIRTO members will be individually providing input into the choice of specific technologies and strategic markets. With regard to the services needed, AIRTO members already do quite a lot of what is needed. But they do not currently have the core funding to operate in the manner envisaged for the TICs. They mostly have to behave very commercially, prioritising large company clients for research and providing mainly routine services for smaller companies. Many of the gaps that exist are thus *capacity* rather than *capability* based.

We would encourage the formation of TICs that reach across the listed technology domains to create multi-disciplinary and multi-sectoral centres of application expertise.

9   Impact and Assessment

The main measure of success has to be impact on economic development and growth. Much work has been done recently by various bodies on measuring added value and the impact of knowledge transfer and innovation activities - and a number of the preferred metrics should be considered for TICs. However, the choice of metrics (and therefore targets) must be made very carefully because ultimately these are what drives the activities and behaviours in the organisation concerned. Many initiatives have been diverted from their original mission because of the need to "chase" simplistic *output* targets. *Outcome* measures should dominate if real long term impact is to be pursued.

The third/third/third funding mix and the amount of private sector funding leveraged will be a performance target that TICs have to go for very hard. This won't be achieved overnight if they are starting from scratch, and this is a reason for utilising existing organisations as the starting point for TICs. Private funding provides the benchmark that says that the TIC is fulfilling a real need. TICs should also be measured against the additional funding they recover from other sources such as European programmes; against numbers of patents and successful spin-outs; and development of skills and career paths - TICs are potentially routes for a valuable apprenticeship from which to move on, either to set up a business or to take up a role in an industrial supply chain.

The TIC concept has enormous potential and longevity, but each individual Centre needs to perform at the highest level. The consequences of non-performance should be a change of management, merger with another TIC or even dissolution.

10 Naming

Whatever name is eventually chosen, the TIC brand will need managing. If performance among the TICs is variable, industry may start to regard some of them as failing. At the highest level, the TSB needs to look after the brand and make sure that the TICs' image and performance reinforces the messages that need to be put across.

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