

Medium term strategy for Catapult centres: Hauser review

University Alliance response, May 2014

Question 1 - The first seven Catapult centres are all up and running, what is your view on progress to date, and your experience of working with the centres, please specify if this relates to the network as a whole or any one particular centre?

1. University Alliance is a non-partisan, non-political organisation working to promote, safeguard and sustain the public benefit delivered by universities. University Alliance brings together 22 of the UK's leading innovative and enterprising universities – major institutions combining science, technology and the creative industries with a focus on delivering for business, the professions and the community.
2. Research at Alliance universities forms an essential part of the UK's research and innovation landscape. Alliance universities have over 300 research teams undertaking world-leading research, employ 1 in 6 of the UK's university researchers and draw over 50% of their research income in STEM-related areas. Alliance universities lead the enterprise and entrepreneurship agenda with over 21,000 business links, including 14,000 SME interactions, per year, and major partnerships with the likes of Siemens, Hewlett-Packard and GSK. Over 75% of FTSE 100 companies have sponsored their staff to study within an Alliance institution, and our universities have up to 70% of all courses professionally accredited. Nearly half (46%) of all turnover from graduate start-ups comes from businesses started by Alliance graduates.
3. Given Alliance universities' strong industrial links and deep understanding of supporting the translation and exploitation of research, we are pleased to be able to contribute to this review of the Catapult Centre network.
4. We welcome the addition of the Catapult network to the national research and innovation infrastructure. Although it is still early to assess real progress in all but a very few individual Catapult centres (in particular some of the High Value Manufacturing Catapult centre, which were based on pre-existing research centres), University Alliance supports a long-term commitment to the network as an industry-led neutral space for innovation and collaborative research.
5. The recognition that university and business engagement operates in a complex environment, and that is no 'one size fits all' model, has been a welcome characteristic of the programme, illustrated by the diverse ways that Catapult centres have been allowed to develop. Quite rightly, since Catapults are industry driven and respond to different sector needs, individual centres have evolved in different and unique ways. Varying levels of development also reflect the origins of constituent parts as existing or new research centres. However, the two quite different foci for different Catapult centres – either challenge based (i.e. Future Cities) or technology based (i.e. High Value Manufacturing) - has created some barriers related to clarity and accessibility which may be preventing full engagement with excellent research and relevant partners across the research community.
6. Alliance universities who are working with existing Catapult centres report positively on their experience. Their engagement includes research, innovation and skills strategy development with Catapult centres including HVM's Centre for Process Innovation and Manufacturing Technology Centre, Connected Digital Economy, Transport Systems and

Satellite Applications. The Satellite Applications Catapult was also included as a partner on a recent Horizon 2020 proposal submission with Coventry University.

7. In order for Catapult centres to be recognised as a mark of excellence in the UK and to achieve world-leading innovation, they must seek to incorporate the best research and researchers and therefore ensure that any single geographical ‘hub’ has well-established links with pockets of genuine research excellence across the UK. Accessibility issues may be hampering full engagement across the research community. Some researchers have reported difficulties in engaging with Centres, particularly at the initial stage. There is a perception in some quarters that Catapults are impermeable or closed to partners who were not core/founder members, particularly at Centres which were set up within a university. Suggestions to improve accessibility include having a single point of contact and increasing outreach efforts, discussed in more detail below.

Question 2 - The review led by Hermann Hauser is specifically asked to look at the shape, scale and ambition of the Catapult network. How would you see the future scale of the network?

8. The Catapult network should be a neutral, national network for collaboration and innovation which capitalises on research excellence throughout the UK. Most Catapult centres are at an early stage of development. In the short and medium term scale should be built by expanding and consolidating the capacity and networks of existing centres to ensure connectivity, rather than significantly increasing the number of centres.
9. Existing Catapults must become more collaborative so that resources are shared for maximum economic benefit. To strengthen the foundations of a comprehensive national network that is both focussed and flexible, and able to respond to the needs of rebalancing of the economy, a growing number of institutions and companies – including SMEs – need to be involved. Catapults should ensure that their pipelines tap into other applicable research excellence in further companies and institutions. This is not to exclude ideas for new Catapult Centres, but to ensure that the existing suite of centres is being fully developed and utilised.
10. Although the Catapult system is different from the Fraunhofer network, the latter offers some benchmarks, including engagement with SMEs. Around 50% of Fraunhofer revenues come from SMEs,¹ whereas many Catapult centres rely on big business and corporate partners. Existing capacity, such as exists within Alliance universities which have strong relationships with SMEs in targeted industries and technologies, should be leveraged to increase engagement with this constituency. These institutions are already proving that partnerships with smaller institutions are possible and that excellent research and strong existing university-business relationships are helping to generate business-led innovation. The Catapult network should ensure that it does not miss opportunities, especially in relation to SMEs, by working with only a limited number of HE institutions and should make maximum use of universities with strong business-facing track records.

¹ Big Innovation Centre (2013). Catapult to Success. p. 40

11. It is also paramount that a long-term commitment is made to the Catapult system. Emulating the success of similar systems such as Fraunhofer relies on building trust and networks of partners, as well as broader understanding about scope and opportunity.

Question 3 - The Catapult Centres that have been established thus far following extensive consultation have either sought to leverage existing capabilities (e.g. High Value Manufacturing) or set up from scratch (e.g. Cell Therapies and Future Cities). What do you see as the best way to create a pipeline and incubate new ideas for potential Catapults?

12. Any new Catapult Centres should reflect industry need and excellence in research throughout the system. The knowledge transfer networks provide a link into both researchers and industry and these could be used with along with other significant networks – including existing capacity in terms of academia-SME hubs (both physically and intellectually) – to offer early-phase test beds for demand and viability. Business should retain its important voice in what it requires and would support.

Question 4 - Are there specific technology areas for example cell therapy or challenges areas for example as in the case of future cities that would warrant a Catapult centre in the future?

13. Clarity over the approaches of future Catapult centres would be welcomed, being either grand challenge or specific technologies-led. In order to capture the most useful knowledge and technology from the UK's world leading knowledge base, full consultation for future ideas should be undertaken with academia as well as industry. Engagement would be aided by clarity in the focus and aim of the centres, which this consultation and report will no doubt achieve. University Alliance would be pleased to convene open discussion workshops to identify key areas for future Catapult centres.

Question 5 - What do you think are the most important aspects a Catapult centre should include?

14. Four essential characteristics of any Catapult Centre are that it is an **industry-led neutral space** for optimal collaboration, has a **single point of contact** for ease of accessibility, utilises **relevant research excellence across the UK** and works closely with key drivers of growth and innovation, **SMEs**, leveraging capacity where this already exists.
15. **Industry-led neutral spaces.** The UK's research and innovation landscape is complex. In order to maintain its unique offering within this, the Catapult network must remain a national industry-led research resource which offers a unique neutral space for collaborative research and development. The added value of a network which aspires to national benefit through working with the best and most relevant partners is clear, but requires that Catapult Centres are fully collaborative and seen to be open to all excellent research (rather than limited academic partners based on precedent or geographic location) and all sizes of business.
16. **Single point of contact.** In order to achieve the aim of being neutral centres of excellence it is essential that Catapult Centres are perceived to be accessible. As well as the potential need for clearer messaging about the network and its offering - perhaps through branding exercises and outreach projects such as open days/trade fairs - it may also be useful to establish a central point of contact for each Centre. To ensure that such a system is not superficial, the Technology Strategy Board could draw on existing

expertise within universities which have highly developed interface mechanisms with businesses, employing and training specialists who are able to connect businesses directly into appropriate research units. University Alliance would be pleased to convene a workshop seeking to learn lessons for Catapult engagement teams drawing on best practice from business engagement teams in universities. We would be particularly **interested in discussing best practice in helping to engage with SMEs**, given Alliance universities' strengths in this area.

17. **Making the most of research excellence across the UK.** Catapult centres provide the space and support for businesses to commercialise new technologies that will be of benefit to the UK. Although physical space is important, to realise their full impact the Catapults must work with the best relevant research drawn from across the UK's knowledge base. To ensure continuing relevance and excellence throughout a range of research activities, Catapults should maintain and strengthen links with both business and Higher Education through a flow of staff, in either direction. More use could be made of joint academic and Catapult appointments to ensure strong links with the research and academic base.
18. As well as engaging with excellent research wherever it is found, Catapults should make use of existing academia-SME hubs based around universities to import excellence in SME collaborative R&D. Extending the reach of existing Catapults is important for increasing their impact and connectivity with businesses and relevant world-class research.
19. **SMEs** are the driving force of innovation in the UK economy. Innovation was responsible for two-thirds of productivity growth between 2000-2007 and was the common defining feature of the fastest growing 6% of businesses between 2002 -2008. These businesses generated half of all new jobs created during this time and were predominantly SMEs.
20. Universities in the UK are key players in engaging and integrating SMEs in the innovation ecosystem. Universities contribute over £3.4 billion to the economy each year through their services to business, including commercialisation of new knowledge, delivery of professional training and consultancy.² As maps produced by University Alliance and included in Sir Andrew Witty's review of universities and growth, *Encouraging a British Invention Revolution* show, expertise in working with SMEs exists across the country.³
21. As Anchor institutions, Alliance universities engage with thousands (many over 15,000 a year), of SMEs in their cities and regions, supporting and stimulating growth. They act as hubs of social and economic innovation and entrepreneurship and centres for SME interaction and support. The research base also collaborates with industry to solve business problems and leverage private investment.
22. For example, as part of the **University of Salford** the major research facility in MediaCity UK connects the BBC and the Digital and Creative Industries sector to international academics and industry research specialists with the aim of generating £25m investment in research over the next eight years.

² HE-BCI survey data, 2011-12.

³ Sir Andrew Witty. (2013). *Encouraging a British Invention Revolution: Review of Universities and Growth*, pp. 67-70.

23. The **University of Portsmouth** shares market intelligence with SMEs and engages in strategic discussions about the big commercial opportunities for innovation and sales and development links to Asia. SMEs also benefit from opportunities to network and present to local business leaders at showcase events around key sector themes such as creative industries, environment, healthcare innovation, high end manufacturing, infrastructure and logistics, and security.
24. **Plymouth University** runs the Growth Acceleration and Investment Network (GAIN) which brings together more than £120M of business infrastructure, world-class research facilities and expertise in a network focused on growth and investment. GAIN is ensuring that SMEs are fully leveraged by providing a fully-supported growth hub, which serves knowledge clusters across a wide geographic area: currently two LEP areas in the South West and expanding. GAIN links Plymouth University's research and teaching expertise with more than 500 high growth businesses, encompassing 32,000 staff and a turnover of £2.7billion.
25. These existing capacities and networks should be leveraged by Catapult centres to access SMEs and engage them further with capacity-building. By identifying strengths across the system including in SME engagement, Catapult centres could improve this area of their interaction with business, achieving high impact in a shorter time than acting alone.

Question 6 - Should Catapult centres also have a role in delivering skills, training and apprenticeships? If so what should this role be?

26. The Catapults are creating new innovative technologies and processes, for which new skills will be needed at apprenticeship level and beyond. Currently it is appropriate for some Centres to train a workforce to use these new technologies and processes alongside their development. Such a role is not appropriate for all sectors and Catapult centres, since many sectors already have a large and effective skills and training infrastructure.
27. The number of UK students undertaking taught postgraduate studies is falling.⁴ This threatens the future pipeline of highly skilled workers and the robustness of our skills base, especially in relation to the innovation technologies which the Catapults are leading. It may also sometimes be appropriate for postgraduate students to be integrated into research projects associated to a Catapult centre to encourage engagement and ongoing skills development. Postgraduate research is also increasingly threatened and co-funded research, thus postgraduates should be central components of Catapult research projects. Any training and accreditation should be undertaken in close partnership with Higher Education and Further Education, however, in order to prevent mission drift.

⁴ HESA Student data shows that the balance of PGT students has shifted from 74% UK students to only 64% since 2002/03. Non-EU students increased by 84% over the same period.

Question 7 - As they become established are there any other roles Catapult centres should play for business other than technology development. The review would be interested in any views around international engagement, business incubation, supply chain development, access to finance?

28. It is key that the Catapults maintain their primary role in the commercialisation of technology and do not duplicate services that are already available by working with the relevant service providers to ensure that the needs of industry are met. Business incubation is appropriate where the nascent businesses rely heavily on the expertise or facilities of the Catapult centre, but in general Catapults should not be used as grow-on space for scaled up and commercially viable businesses or products. Activity beyond TRL 7 should aiming to be investor ready territory, so Catapults should have links to (but not seek to emulate) these resources, including Enterprise Zones, University Enterprise Zones and University Business Incubation Centres, which can offer this type of support and should be resourced and extended for this purpose.

Question 8 - There is also an opportunity for Catapults to play a role in addressing policy challenges, for example the development of standards and addressing regulatory challenges in their areas. What do you see as the role for Catapults in response to policy challenges?

29. Standards and standardisation are important for commercialising new products, and regulation or policy challenges can be a source of innovation. As is already the case, some Catapult centres are breaking new commercial and technological ground and are therefore playing a key role in the cutting edge of regulation, standardisation and legislative decision making. The appropriateness of such a role must be decided on a centre-by-centre basis. Catapults could and should support standards where this is necessary for commercialisation. The concern, however, would be that the Catapults extend their reach and lose focus on their primary role to support the commercialisation of new products and services for benefit of the UK economy.

Question 9 - The 1/3 revenue Catapults generate from business is at the heart of ensuring they remain business led. Are there alternative financial models that should be considered that would enable either more dynamic growth or improved exploitation of technologies?

30. The 1/3 revenue model has been operating successfully over a long period of time elsewhere within Europe, particularly within the Fraunhofer Institutes in Germany. This is a well-used and well-tested model that ensures that the Catapults retain a close working relationship with businesses. The 1/3 funding from business must be the minimum if they are to remain "business led". A possible issue is whether there is sufficient industrial capacity within the UK that will allow 1/3 funding from business – particularly SMEs. The two variegated approaches to Catapult centres – the grand challenge approach and specific technologies – may require different types of investment, for example the former could require greater start-up funding and full analysis of different approaches should be undertaken.