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Cities and their Science Parks – Growing local economies. Why economically successful city regions need a Science Park

Flash Session:
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Why Economically Successful City Regions Need a Science Park

Executive Summary

As in the past, modern cities can provide certain conditions that make it possible for a 'creative cluster' to emerge and contribute to its economic activity and global competitiveness. These conditions include a unique sense of place that attracts the best talent to its businesses and universities, a social and business culture that supports entrepreneurship, risk capital and associated business support and effective formal and informal networks. Defining research intensive clusters (RICs) as a sub-set of creative clusters that rely primarily rely on research and development for their creativity and competitiveness, the paper then comments on the key role played by science and technology parks in the development of RICs, acting as a gateway through which firms enter into the innovation system of the city region.

Keywords: innovation system; creative cluster; research intensive cluster; knowledge economy; science park; city region

Cities as drivers of their regional knowledge economy

Increasingly, successful city regions are being recognised as the engines of their local economies, providing many of the necessary conditions for building a 'creative cluster'. In the UK for example, the recent *Review of sub-national economic development and regeneration*[1], announced the government's intention to allow economic development issues to be managed at the level of the city region rather than at regional level as is the current situation.

The world cities of the new economy are not necessarily those that were successful in the industrial economy; however there are similarities between the cultural conditions in both cases. The industrial revolution was a time of innovation, tolerance of failure and inclusivity. Trade and migration of populations into the cities led to increased diversity and challenged established social structures. In my city of Manchester, England, for example, this "original modern" city absorbed new people with good ideas wherever they came from and it had a "go for it" culture that built the UK's first canal, the first passenger railway station and the first aircraft factory.

In the transformation of the UK economy from manufacture of goods to manipulation of knowledge and development of high value services, the resident population of city centres declined drastically, leaving them deserted and dilapidated. But in the last quarter of the 20th century that decline has been reversed, city centre populations are on the increase and once again the cities of Europe are becoming exciting and vibrant, sustaining a 24 hour lifestyle that attracts the entrepreneurs and knowledge workers of the new economy.

So the idea of cities as a source of innovation and creativity is not so new. The raw material of our economy has changed but the necessary conditions for it to be transformed into commercial activity are similar; creative people, enthusiastic investors and visionary civic leaders who create a policy environment to support entrepreneurship and commerce.

[1] www.hm-treasury.gov.uk/media/9/5/subnational_econ_review170707.pdf

Development of Creative Clusters – the contribution of an urban environment

"Having a readily available workforce is one of the best investments cities can make"[2]

Whether we think in terms of Richard Florida's 'Creative Class', or the 'Talent Economy' described by Tom Cannon in last year's IASP conference in Barcelona, there is a common understanding that the competitiveness of a creative cluster is primarily dependent on the quality of the population; how well-educated they are, how creative and how entrepreneurial. They are the source of the ideas that become new goods and services. Many creative industries - the performing arts, software development, fashion - have no assets other than their key workers who are highly mobile and who are attracted by vibrant and exciting urban environments.

In renaissance Florence and mediaeval London the craft guilds and livery companies supported the development of creative clusters. Workshops were (and sometimes still are) located physically close together and the guilds provided accreditation of their members, structured professional development paths, networks, mentors and financial support. In the knowledge economy we need a similar convergence of resources and infrastructure.

On the positive side, a great city provides a unique sense of place that distinguishes it from other world cities and acts as a magnet to talented people. This requires a reverence for heritage, wholehearted embrace of the new and a realistic response to the challenge of spreading the benefits of a successful economy to all its citizens. Great cities have an identifiable character that encompasses their physical location, climate, architecture, and history but that also communicates the nature of its citizens. In his latest best seller "Who's Your City?" Richard Florida argues that the city where you choose to live will have a huge influence on your career, your partner and your happiness.

The best talent can make global choices about where to live and work and their decisions are not only based on the remuneration package of the main earner in the family. A new location has to be able to offer good schools, a safe environment and a good 'quality of life' however an individual may define it. Knowledge workers want a variety of urban amenities and outdoor recreational activities. Furthermore, they will choose to live in a place with a critical mass of activity that provides plenty of career choices – and usually for two people. World cities offer all this - and the diversity, tolerance and density of human interaction that are key pre-conditions for creativity.

Characteristics of Creative Clusters

"Almost all creative centers are places with a high concentration of educated people and the ability to retain skills."[ii]

However, there are other characteristics shared by existing creative clusters and the civic leaders of cities that aspire to become competitive in the global knowledge economy need to have regard to the development of all the constituent parts.

The social and business culture of the community has a key role in supporting entrepreneurship. This is often a question of what stories are told, whether the media treats entrepreneurs as heroes or villains and whether individuals involved in business failure are condemned or admired for learning lessons and starting again. If there are no business failures in a community then it's likely

[2] Wu, W. (2005), *Dynamic Cities and Creative Clusters*, World Bank Policy Research Working Paper 3509, World Bank, New York.

that the culture is too cautious. Most start-ups benefit from mentors, so a culture of loyalty and pride in the community can be a positive force. In the US and more recently in India, there is cultural pressure on successful entrepreneurs to get involved in other start-ups as mentors as well as investors. In China, the government has introduced strong financial incentives to attract Chinese nationals with overseas commercial experience to return home and start new businesses.

The importance of the availability of risk investment to new firm growth and start-up has been well documented. In the UK, partnership between the public sector and private fund managers has filled the funding gap created as venture capitalists have focussed on less risky and higher value investments to justify their expensive due diligence. Several UK universities have developed their own 'proof of principle' funds that have enabled them to support academics through the critical and riskiest first stages of development. However, in the UK, few clusters outside the golden triangle of London, Cambridge and Oxford have yet reached the stage where entrepreneurs don't put 'inadequate funding' top of their list of barriers to success.

If you talk to funders, they will argue that in many ways, the specialist business support they provide in the form of a mentor or non-executive director is more important than the cash itself. Certainly the cash is far less effective without the input of an experienced entrepreneur with recent knowledge of the appropriate business sector. Again, the US example of serial entrepreneurs and entrepreneurs becoming business angels is recognised and emulated but not yet fully operational in the UK except in key locations.
A fourth necessary condition for a successful creative cluster is effective formal and informal networks. These support and lubricate the relationships between knowledge creators, exploiters and investors as they form and reform around an individual or a technology explosion. They are as fluid and changeable as the knowledge economy itself, and members need to be ruthless in evaluating which networks best serve their purpose and are worth their valuable time.

Research Intensive Clusters

"Successful RICs stimulate innovation and exploitation of research results that generate jobs and wealth at regional level."[3]

Research intensive clusters (RICs) may be defined as a sub-set of creative clusters that "…predominantly rely on research and development (R&D) as a source of their innovativeness and competitiveness." As well as the generic characteristics of creative clusters, they require a strong science base, processes to enable the creation and development of high-growth start-ups and a framework to support international collaboration. Therefore the cluster always encompasses a university or research institute which not only provides the science but, in the case of the university, also supplies an educated workforce. Furthermore, successful research intensive clusters are based on a shared vision amongst key stakeholders who work jointly to define and eliminate weaknesses and strengthen competitive advantage.

Science and technology parks play a key role in the development of RICs, initially supplying property solutions but subsequently some of the less tangible characteristics that have been found to be essential. Today STPs' unique role is to act as a gateway for firms to enter into the innovation system of the city region. They should be fully integrated into all parts of the triple helix, facilitating organisational learning to build the competencies needed for collective entrepreneurship. They should provide an intervention in the life cycle of selected knowledge-based

[3] *Regional Research Intensive Clusters and Science Parks.* Prepared by an Independent Expert Group of the European Commission, DG Research. September 2007

companies that accelerates their growth like the electromagnetic fields of a synchrotron accelerate the electrons around the ring.

Science Parks' Contribution

Facilities – STPs' initial offering was appropriate accommodation for science and technology based firms at a stage in their development when they couldn't afford their own premises. It is still the case in various sectors that the market will not provide specialised facilities on terms that are acceptable to firms with a lot of potential but not much cash. Science parks that are part-owned by universities have taken a different view of the risk involved in admitting as tenants, spin-out companies with neither physical assets nor income.

More recently, as the drivers of innovation have been identified, science park buildings have been designed to provide spaces for purposeful conversations. Physical environment will inhibit innovation if firms sit isolated behind closed doors in offices that are physically uncomfortable, discouraging interactions between colleagues never mind between firms. A well-designed science park with appropriate facilities – café, fitness centre, crèche – has become an attraction in itself to entrepreneurial academics.

Specialised Business Support - the terms 'incubation' and 'acceleration' are used to describe a range of specialised business services that have been developed to nurture high-growth, technology based firms. The 'gazelles' that are built around innovative intellectual property and have a market potential that means rapid expansion will always attract funding and the support that goes with that. However, gazelles are few and far-between even in the most mature RIC and many science parks provide less resource intensive but equally critical business support to their tenants.

Many science parks run incubators, linking an intensive business support process with appropriate accommodation. This can provide a sustainable model when companies 'graduate' from the incubator to take space on the main park and the incubator's losses can be set against the creation of additional commercially viable tenancies. Other incubation models involve the incubator company entering into an agreement with the incubate that involves an equity share or royalty or some other way of sharing in the success of the Company that results from the intervention of the incubator.

Within successful RICs, universities are more than just the source of high-growth start-ups. Other aspects of university creativity and innovation are also useful to the economy and society and science parks are well-placed to act as the intermediary that links its tenant companies to university expertise of all kinds. In msp for example, more than twice the number of companies on the park have formal links with the city's universities than are university start-ups or spin-outs.

Physical Cluster of High-tech Firms – a feature of creative industries, that is sectors of the economy whose products fall within the range of IP law, is that the sectors are made up of lots of small firms that are flexible, independent and seek to work collaboratively. They are also resource constrained, have few in-house experts outside their core business and need access to shared equipment, technology and training in order to keep costs down. Science parks provide a physical location where small firms can cluster, leading to collaboration and competitiveness, and also attracting industrial research teams in search of opportunities for open innovation.

Most science parks deliver seminar programmes and expert 'surgeries', and tenant events to 'optimise serendipity' and encourage inter-company trading. Sector focussed parks can provide access to tools that a small company could not afford yet that are critical to their latest innovation,

e.g. software development platforms, mass spectrometry. In some cases, the public sector has intervened to establish a science park around a national scientific resource such as a synchrotron (Harwell and Daresbury in the UK).

A Gateway to the Local Innovation System - Research commissioned by UKSPA in 2003[4] found that "…the most important single factor affecting the performance of individual science parks is the state of the sub-regional knowledge economy within which they are operating." Within a mature knowledge economy, formal and informal networks are the mechanism whereby money meets idea and innovation meets market. The report *Third Generation Science Parks*[5], recording the deliberations of a scenarios workshop held in Manchester in October 2006, recognises the value of connectivity and networking to the park and its tenants and suggests that parks may in future go so far as to assign to their networks a financial value that can be recorded as an asset on their balance sheet.

To add value, a science park cannot just be the host or even co-ordinator of networks but a gateway whereby firms enter into the innovation system of the city region. It should be fully integrated into all parts of its local triple helix, facilitating organisational learning to build the competencies needed for collective entrepreneurship. In particular, it should be an integral part of its university's activities. It will exert an influence on the university's curriculum, graduate destination pattern and research agenda as well as playing host to spin-out companies. Entrepreneurs on the science park will be mentors and speakers on university courses, helping to shape an academic culture that recognises the equal validity of commercialisation and publication.

Support for International Links – high-growth creative companies are not satisfied with local or even national networks but seek out the best partner organisation wherever they are located in order to become globally competitive. As well as using the IASP network for knowledge exchange about innovation within our own businesses, we can also use it to support our tenants in their global aspirations by pointing them towards potential partners. There are many examples of formal and informal international collaborations between IASP member parks but I'm not sure how many of these have yet delivered tenant to tenant interactions.

Support for Inward Investment – Finally, through a pilot programme run in Manchester since 2005, we have demonstrated the benefit to small, high-tech companies from overseas of locating on the science park. The Manchester International Innovation Centre (MIIC) was created by a partnership between msp, the city council, the regional development agency and Manchester's inward investment agency, MIDAS. Physically it is a fully serviced set of small offices, co-located with a hot-desking area, kitchen and break-out area. More importantly, it is supported by a full-time project manager employed within MIDAS with the responsibility of facilitating the companies' establishment and development in Manchester. Companies spend up to 12 months in the MIIC before moving to more permanent premises wherever is most appropriate for their business.

As tenants of the science park the companies also become members of a creative cluster and are able to benefit from the Park's shared facilities and networking and training opportunities. In the three years since it was created, 22 companies have spent time in the MIIC, 7 have chosen to stay in permanent accommodation on the science park and a further 9 are still trading in the region. An independent study of the success of the initiative highlighted the importance to the companies of their location on the science park: *'It is very important to be near other high tech companies*

[4] *Evaluation of the past & future economic contribution of the UK Science Park Movement*. Prepared by ANGLE Technology, 16th October 2003. www.ukspa.org.uk

[5] *Third Generation Science Parks*, edited by Professor John Allen, ISBN : 978-0-9549084-1-6

because you need the atmosphere and a population from which you can easily hire people, you also need the mindset' (MIIC company comment).

Conclusion

Having defined research intensive clusters as a sub-set of creative clusters, it becomes clear why some 'science parks' extend their remit beyond science and technology based firms into the creative industries. Much of the 'added value' activity of science parks is designed to stimulate innovation within its tenant companies and all firms within the definition of creative industries given above would benefit from these activities. Furthermore, the most exciting innovations often occur at the interface of disciplines and by their nature cannot be predicted so the inclusion of a 'wild card' in a network should be encouraged.

Looking ahead, STPs are well-placed to be equal if not lead partners with their cities and research institutions in building research intensive clusters. We are the bridge between our city's knowledge generators, the commercial world and the public policy makers. Whether in old cities or new cities, science park managers should set an example of innovation, collaboration and partnership to stimulate growth.