Global clusters and campuses: an international perspective

Helsinki : Otaniemi campus.

Since 2010, the IAU îdF has conducted international comparative studies into *Science Cities.* These practical foreign case studies are highly instructive and challenge received wisdom on the theory of clusters and the planning of campuses.

The series of studies entitled *Science Cities* focuses on the concrete and innovative planning of university or R&D campuses and the development of economic and technological clusters in foreign metropolises. The aim of this project is to gain a fuller understanding of how these innovative redevelopments engage with the existing or maturing economic ecosystem of metropolises and makes them more competitive for the future.

The first case studies were devoted to the clusters and campuses of the Zurich, Helsinki, Singapore and Seoul metropolises.
These four analyses of *Science Cities* highlight a number of good practices in respect of clusters and more generally regarding these much discussed places of innovation, whose definitions are numerous: from the campus to technology parks, clusters, science cities, innovation ecosystems, clusties, etc. To start, practical case studies – Digital Media City and

Songdo in Seoul (South Korea), Life Science in Zurich (Switzerland), Otaniemi and Arabianranta in Helsinki (Finland) and One-north in Singapore – offer us some unique lessons relating to the cluster theory[1].

Economic strategies are essentially the same from one metropolis to another

The chosen positioning on buoyant sectors is often linked to an international context at a given time and the same generations of innovative places are often found from one country to the next.
This currently concerns ICT, health and biotechnologies, creative industries, green techs, the importance of practices and of the service economy, etc.

Local culture to the fore

What differentiates the cities and clusters analysed is the culture. Clusters all hold up a mirror to the host society and its culture. They are depositories for what is deemed best at a given moment, what is valued, the key assets of an economy and what local players foresee in the future economic and scientific strategy, the desired positioning for the metropolis or even the country in general. The cluster is a receptacle of these expectations.
As a magnifying glass for a culture at a given point in time, a cluster tells us a lot more than the ingredients and the magic recipe supposed to make it up. But its flaws are also revealed.
Thus, it is always interesting to focus on the key players, the leaders of these highly effective places of innovation.
In South Korea, the main players in the Digital Media City cluster are the public authorities (the state, the Seoul municipality) and major companies. Very few SMEs are present since SME jobs are undervalued in South Korean culture, while very large companies and public sector careers are assigned considerably more value.
In Singapore, the key elements of Biopolis in the One-north district are significantly different, with its

(1) Lartigue (Sylvie), Soulard (Odile), *Clusters mondiaux : regards croisés sur la théorie et la réalité des clusters ; identification et cartographie des principaux clusters internationaux,* IAU îdF, January 2008.

persistent presence as a crossroads for trade between East and West, multiculturalism in a cluster which endeavours to be intersectoral and open to the world, fostering joint ventures with foreign countries, and a place with high appeal for international talent.

In Zurich, the national confederation context, where economic forces are more widely dispersed across the country (for instance in health, clients are in Basel, major academic players in Zurich, etc.) is found in the spatial form of the life sciences cluster. It is multi polar with several anchoring points in the city and in Switzerland. Its main players are two century-old universities: ETHZ and the University of Zurich, both educational establishments and renowned research institutes boasting strong technological skills which they seek to develop through the creation of numerous spin-offs in the field of health. The international financial market and easy access to capital do the rest.

In Helsinki, the Otaniemi cluster is something of a model viewed from abroad because it groups together all the ingredients of a cluster within a limited area (4 km²) together with a virtuous local ecosystem. But it is worth bearing in mind that it took over 40 years to attain this stage of maturity, that the frequently imposed autonomy of Finns (due to their geographical position, climate, language barrier, dire economic situation in the late 90s, etc.) led them to find their own

innovative positioning and seek out valuable external partnerships. The taste for consensus, humility and perseverance specific to Finnish culture have largely contributed to its success. The cluster was founded on a leading technology university, the TKK, which has now merged with two major Helsinki universities, becoming Aalto University and offering courses which combine technology, economics, arts and design so as to accompany the future dynamics of the metropolitan ecosystem. The cluster is rich in its diversity and the recent setbacks experienced by the giant Nokia should not jeopardise its future survival.

Helsinki, Zurich, Singapore and Seoul are four cities featuring very different local contexts, with four successful campus and cluster experiments. Each cluster has quite logically drawn on its local strengths, particularly in defining the themes of clusters and their final form.

Although the major themes of activities for these places of innovation seem very similar (ICT, health, creative economy, etc.), all have specific characteristics which allow them to build on local strengths and make effective use of the complementarities offered by the metropolises concerned.

Singapore has no large national companies. Biopolis is naturally geared towards pulling in foreign expertise; Zurich has academic players of considerable renown in the field of life sciences but

all pharmaceutical clients are based in Basel: it is building a networked cluster which relies on the collaborations of the two leading universities, and favours the emergence and growth of spin-offs and the attraction of SMEs in direct proximity. South Korea has powerful conglomerates which are established abroad, particularly in ICT and creative industries, as well as a technophile population with a certain taste for novelty. Seoul is building an economic cluster which combines culture and South Korean technologies with a showcase effect.

Time is another key variable

The timelines for these places of innovation are multiple: less than ten years for the DMC in Seoul or Biopolis in Singapore as against forty years for Otaniemi in the Helsinki region.

The clusters studied were planned or have emerged over time, by means of accumulative and network approaches, becoming natural clusters. Otaniemi embraced the cluster concept in the 2000s but all the ingredients were already in place, so all that was missing was a smattering of strategic initiatives and a strong dose of marketing to spotlight the site. The Digital Media City in Seoul is a good example of the opposite: starting from a wasteland, a former landfill, in a neglected area of Seoul, the city is now seeking to build one of the world's leading clusters on the media and leisure sector by relocating activities present on several of the city's sites to the district of DMC. As for Zurich, the Canton has relied on two campuses of the Polytechnic University (ETHZ), one in the city centre and one in Hönggerberg, to generate economic impetus.

In addition, an ecosystem is taking shape between people in specific locations: infrastructures are therefore very important but we also need a common culture. Today, the constituent ingredients of magic clusters are well known and are the subject of explicit

knowledge: two clusters analysed in Singapore and Seoul clearly demonstrate the implementation by local authorities of theoretical knowledge about the success of innovation ecosystems. But implicit knowledge, that which calls on know-how and interconnections between people, is more difficult to implement. The density of relationships between people and the ability to create nodes, chance encounters and serendipity take time. This is clearly illustrated with the Otaniemi cluster in Finland which took several decades to grow into a system.

Would it nonetheless be possible to accelerate the time frame? Zurich and its cluster of life sciences, and the two Asian examples seem to prove that this can be achieved, to the extent that the cluster is rooted in the specific skills and resources of a given territory.

Appropriation of the project by the local population is a key success factor

Establishing living labs (in situ laboratories) with residents in Finland, testing products from the DMC with a technophile population in search of entertaining experiences at the DMC in Seoul, opening of the Hönggerberg campus in Switzerland to resident populations (while favouring the establishment of economic activity on the former industrial wasteland to the west of Zurich and not on the protected wooded area of the campus). In all these examples, public transport and physical connectivity between entities in the cluster and between the cluster and other hubs of the metropolis is well planned. This means that the cluster is not an enclave; it is instead wired into the wider socio-economic base of the host territory.

The surrounding ecosystem, provided by the metropolis, is essential to understanding the speed and success of these clusters. While keeping in mind that an ecosystem cannot control itself,

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Digital Media City in Seoul, a strong planning.

In Singapore, Biopolis vertically integrates the elements of the cluster's triptych: R&D, businesses and education.

in fact, it tends to cultivate itself and at best, feed of itself. It takes diversity and harmony to innovate and the science cities, these new places of innovation, strike a balance between the linearity and complexity of innovation systems. They foster encounters, co-development processes and more co-design while maintaining certain more conventional research processes, closed to the outside.

Academic, technological or economic clusters?

The triple helix of business/higher-education/research. The balance, often advocated in the theory of clusters, of the business/higher education/research triptych varies from one project to another and seems difficult to define. The weight of history is key. Although the Helsinki region in Finland, gathered over time a critical mass of expertise among its academic (in Otaniemi) and private (in Keilaniemi) players, other clusters cannot draw on the same type of dynamics. Some science cities are based on academic and technological clusters such as the Life Science cluster in Zurich, others on an economic and technological cluster, like the Digital Media City in Seoul. Another approach concerns the state/metropolis of Singapore which is devoid of large national companies. It stands as a hub for Asia and a natural gateway for businesses, research and development institutes, foreign training organisations and universi-ties. Its Biopolis/media/ICT cluster therefore naturally combines all sectors with high-added-value activities in order to attract coveted foreign talent. The ambitious design of buildings even goes so far as to integrate all the functions traditionally assigned to the cluster concept.

Helsinki hosts a model cluster, which combines all the links in the research-businesses-education chain and a highly favourable local context in Otaniemi. Zurich, with its Life Science cluster, opted for networking on separate sites. Yet these two metropolises have a common point of departure: the two key players in these Finnish and Swiss clusters are their technological university, TKK (now Aalto University) and ETHZ. In the 1960-70s these century-old institutions abandoned the city centre in favour of a landscaped campus on the outskirts of town. But although the TKK moved entirely and therefore had to reconstitute a local and com-prehensive ecosystem in Otaniemi, ETHZ kept a campus in the Zurich city centre, in addition to its new campus in Hönggerberg. Yet the proximity of the old campus with the University of Zurich, another major university allowed it to initiate the network dynamics of the Life Science cluster, which now finds relay points at various locations in Zurich. The weight of history and choices of these universities in terms of campus have greatly influenced the urban form of the clusters which have formed with them.

An opposition between Western and Asian clusters?

At first glance, the clusters analysed in Asia are the result of a determined planning approach, making a clean sweep of the past and revealing gigantic projects. Conversely, European clusters have capitalised on strong existing and structuring elements (university campus, redeveloped industrial wasteland, etc.). There is a clear difference between the expression of a flow culture among Asians, imbued with a cyclical conception of time, and that of a stock culture, more prevalent among Westerners, who are more attached to heritage buildings, anchored in a linear temporality. The Swiss and Finnish ways of doing things are more organic and cumulative, careful nurturing institutions and facilities to be part of an already well-populated urban fabric, rather than the 'greenfield' site approach of Seoul and Singapore.

International openness, concept or reality?

The two clusters which play the international card most, Zurich and Singapore, are the two most attractive cities for foreign talent, for reasons of quality of life and tax benefits... In Helsinki, the Otaniemi cluster had to win its spurs before becoming attractive to foreign talent. In Seoul, the opening to the West is very recent, language and cultural barriers are still generally evident: the gamble for attractiveness *vis-à-vis* foreign companies and their employees has not yet paid off. Outward display? The determination of key players in the cluster, in line with local communities and the state, is proving paramount to the successful development of these places: there must be a convergence of local policies and a certain dynamism among players. And a coherent outward display remains essential, even if local rivalries exist between territories (for example in greater Helsinki, between the Helsinki municipality and Tapiola/Otaniemi). Or if the effects of sedimentation of structures and support schemes hinder governance (Zurich has no metropolitan governance, it remains primarily a financial capital), etc.

What lessons for the Île-de-France (Paris Region)?

This research demonstrates the importance of the individuality and specific identity of metropolises. Whenever we think about

In Zurich, the Life Science cluster is multipolar and is particularly reliant on the two campuses of the ETH University, on the outskirts in Hönggerberg (right) and in the city centre (above).

a university campus and cluster, it is always tempting to point to Silicon Valley and Stanford University. The examples studied here show how metropolises of highly varied size, with varied local contexts, have strong visions for how they want to develop in the future. Each, in its own way, is seeking to capitalise on its economic and scientific assets but also its cultural ones.

Île-de-France can claim assets which are as multi-faceted as its territory: a dense network of resources and exchanges related to its status as a global metropolis. All ingredients need to be catalysed in the multiple attempts by the Paris area to get innovation territories to emerge.

The cumulative (in Saint-Quentin-en-Yvelines) and top-down planning (Saclay, where there is also a cumulative dynamic, or in Descartes in Marne-la-Vallée) approaches in Île-de-France can be analysed in this light.

An identity rooted in a territory

These foreign examples remind us that the local socio-economic base and culture are what give major global clusters their specific nature. If we take the US example, we can assume that the Internet continuum will remain Californian and it would be futile to try to create a Silicon Valley or the future Google in Île-de-France. However, the Parisian metropolis has its own genius, the beginnings of a French touch that our foreign partners are gradually recognising, particularly in the areas of creative industries and content: design, urban planning, understanding of social relations and a certain finesse in their regard, the art of French living, quality of life, many metropolises around the world envy us. Competitiveness clusters are already capitalising on these strengths, like Cap Digital (which has created more than 130 companies since its certification), and experiencing the kind of success which should now be capitalised on in order to move to the next level.

Foreign case studies also reposition us in an international context where the technological drive is unprecedented and concerns all sectors of economic activity. Anticipating the creative synthesis phase, where all this new knowledge synergises around concrete innovations providing jobs, is essential. The effectiveness of cooperations is at the heart of this collective challenge and in a certain manner, the cluster approach addresses this issue. The integration of uses and the human aspect in the economy heralds perspectives for industry and services.

The Île-de-France region is well positioned on the sectors related to sustainable cities, mobility, creativity, health, etc. It is now a matter of taking advantage of the time lag between discoveries and their integration into products and services, to capture and anchor in the region these new economic activities, generators of future jobs. The conditions in which companies are welcomed and the quality of life are key to attracting international talent and expanding businesses. As for planning, the dispersion of forms of production reveals new needs (flexibility, proximity, urbanity) to which the metropolis is adapting. Because traditionally the places dedicated to research and innovation have been relatively free of them. By addressing the private sector's approach to choosing sites, public policies can support these movements by offering innovative solutions in terms of density, urban integration or financial arrangements. Because integration into the space of economic functions and related living spaces, as well as appropriation by locals, help intensify interactions and complementarities, as demonstrated by foreign experiments with new forms of urban innovation, which combine knowledge, technology, economics, culture and urban planning.

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In One-north in Singapore, a shuttle connecting the various buildings of the cluster and the metro.

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