China’s Emerging Innovation Hubs

Page 16
# Table Of Content

<table>
<thead>
<tr>
<th>Page</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>05</td>
<td>Foreword</td>
</tr>
<tr>
<td>16</td>
<td>Cover Story</td>
</tr>
<tr>
<td>07</td>
<td>The geography of innovation: why place matters for the digital economy</td>
</tr>
<tr>
<td>12</td>
<td>Neighborhood vitality index for Innovation Districts</td>
</tr>
<tr>
<td>23</td>
<td>University of Waterloo Drives Innovation in Waterloo Region</td>
</tr>
<tr>
<td>26</td>
<td>More expansive, more inclusive: The Science Center leads urban transformation in West Philadelphia</td>
</tr>
<tr>
<td>30</td>
<td>AMS Institute: How the city of canals braces for its urban challenges</td>
</tr>
<tr>
<td>34</td>
<td>Place-based Innovation Ecosystems: a snapshot from Europe</td>
</tr>
<tr>
<td>38</td>
<td>In Practice</td>
</tr>
<tr>
<td>39</td>
<td>AREA Science Park: Innovation ecosystem in Friuli Region</td>
</tr>
<tr>
<td>40</td>
<td>Conversation with Prof. Dr. Eric Viardot, and his new book</td>
</tr>
<tr>
<td>42</td>
<td>At a Glance</td>
</tr>
<tr>
<td>44</td>
<td>To read: recent reports</td>
</tr>
<tr>
<td></td>
<td>To visit: upcoming events</td>
</tr>
</tbody>
</table>
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read more on p.44
It is our great pleasure to welcome you to our first issue of 2018, with our brand-new look and fresh perspective on the current theme of innovation districts. This has been long overdue, since we witness the topic has increasingly attracted more participants in our conferences, workshops, and in our latest UIIN Australia Chapter Forum in the search for a better understanding of the concept and its real-world applications.

Despite a slow development, more regions across the world acknowledge the growth potential that arises from collaboration in the emerging innovation districts. Whether anchored by a core educational institution or a business organisation in the urban centre, or developed around a traditional science park, adoption of these place-based urban development strategies has proven to offer extensive opportunities by connecting high-growth start-ups, talents, incubators, open innovation spaces, housing, and public amenities. While this particular issue gives credit to only a few initiatives, many other regions have been experimenting with innovation districts one way or another to establish a more sustainable and inclusive local economy.

Our cover story takes us to China’s four burgeoning innovation city/districts - Yuqiao Innovation District, Fuxing Island, Sunqiao Urban Agriculture Innovation District in Shanghai, and the city of Wuhan, two of the most dynamic cities in the world. The article highlights the unique Chinese interpretation of cities as innovation hubs where authenticity and accessibility are of high importance, representing a strong alternative to the isolated and urban experiences of the Silicon Valley.

Our featured articles also bring to light a range of initiatives from institutions of a wide geographical coverage. Carlton Connect Initiative (CCI) currently develops Australia’s major innovation precinct in Melbourne, in the leadership of the University of Melbourne and its regional partners. Across the Pacific, Ruta N, Medellin Colombia works on the development of a ‘neighborhood vitality index’, set of indicators to measure the performance of innovation districts based on a number of development areas. Up in the North America, University of Waterloo - the most innovative university in Canada - leads the transformation in the wider Toronto-Waterloo region, steered by innovative teaching, research, and industry engagement strategies. Meanwhile, University City Science Center in the US expands its reach to local communities in the form of educational and workforce building, as well as creating open public spaces to enrich the innovation ecosystem in Philadelphia. Back in Europe, Advanced Metropolitan Solutions Institute (AMS Institute) in the Netherlands commits to develop solutions to Amsterdam’s urban challenges with its academic, industry, civic, and public partners. We also bring to your attention two selected good practice ecosystems driven by local universities and governments, both from the State of University Business Cooperation (UBC) study archives: AREA Science Park building up the Italian Friuli-Venezia Giulia region and Gdansk University of Technology developing the Pomeranian Region Cluster in Poland.

Complementing our in-focus articles, don’t miss our interview with Prof. Dr. Eric Viardot, on his new book, Revolution of Innovation Management, and make sure to have a glance at our selected reports and upcoming events.

We thank our authors for their contributions and hope to have contributed to your endeavours towards creating a more sustainable and inclusive local economy.

Hacer Tercanli  Arno Meerman
Managing Editor  CEO, UIIN
The Geography of Innovation: Why Place Matters for the Digital Economy

“Places matter; they map our lives,” says writer Rebecca Solnit. The Carlton Connect Initiative (CCI) is a place that matters, not only to the University of Melbourne, which spearheads its progress with partner Lendlease, but also to the city in which it is based and the community that creates its identity, fosters its narrative and reaps its impact.

Put simply, CCI is a cultural and capital transformational project to turn a former large hospital site into a thriving ‘innovation district’. Sitting adjacent to Australia’s leading research university and 800 metres from the city of Melbourne’s central business district, CCI ensures the 3Ps - “place, proximity and partnerships” - support the city’s and nation’s aspiration to create economic, social and equitable prosperity that is underpinned by knowledge, networks and pioneering ventures.

This concept of using the 3Ps to tackle challenges is not a new phenomenon. Throughout human history, people have come together to solve complexity, deal with crisis and innovate. Renaissance Florence is a great example: via collaborative co-working spaces (guilds), mentoring and patronage diverse people from engineers to artists worked together and innovations such as “perspective” were birthed and engineering feats such as Brunelleschi’s roof for the Duomo di Firenze.

As we enter a new era now coined “the 4th Industrial Revolution” it is easy to see how initiatives like CCI can foster innovation. Place based innovation ecosystems are creating ways for start-ups, researchers, community leaders and policy makers to collectively tackle complex problems that can’t be solved alone – e.g. climate change, sustainability, food security and city resilience. What is “new”, and well articulated by the Brookings Institution in its seminal paper “The Rise of Innovation Districts”, is a consistent emerging “pattern” occurring across those cities globally that are driving the “innovation economy”. This pattern most often includes a clustering of companies, start-ups, accelerators/incubators with anchor institutions (e.g. universities and research organisations) in physical places that are highly walkable and/or accessed by good public transport, with social and public spaces to network. Such spaces bring to life and realise the value in the density of talent that is attracted to these hotspots.

So how does CCI fare? For the past 3 years it acted as a "prototype" testing the principles of best practice innovation districts via a 2 story stripped down building on the street corner of the hospital block named lovingly

BY JACYL SHAW
DURING ITS EXPERIENTIAL PERIOD, CCI HAS BEEN HOME TO AROUND 250 PEOPLE THAT REPRESENTED A DIVERSE AND VIBRANT TENANCY MIX FROM INDUSTRY, GOVERNMENT, ACADEMIA, START-UPS, COMMUNITY AND THE CREATIVE SECTOR.

During this experiential period CCI has been home to around 250 people that represented a diverse and vibrant tenancy mix from industry, government, academia, start-ups, community and the creative sector. Molecular biologists lunched with climate scientists in the makeshift kitchen whilst co-founders of immersive media start-up Phoria collaborated with artists met during one of the science led art installations held in the gallery space.

PhD students from the Climate Energy College on level 1 played in the Friday LAB-14 soccer team with design thinkers from IBM and computer scientists from one of the government supported research labs (VLSCI) on the ground floor in residence. One of the data scientists volunteered regularly at weekly hackathons and would 3D print prototype earpieces for another start-up at CCI (Nura) who went on to raise the largest Kickstarter amount in Australia. Joining this colourful eclectic and passionate group of tenants were over 75,000 patrons who attended weekly activities on site. These include hackathons, meetups, board meetings, pitch nights, mentoring sessions, Thought-LABS, musical performances, art exhibitions, conferences, workshops, TEDx talks, product launches, soccer games and table tennis tournaments, political media launches and rock concerts. The latter is indeed true! - we converted the hospital basement for 1 week into a dance club for the City of Melbourne’s Melbourne Music Week and welcomed 7,000 revellers not to mentioned offered a “knowledge programme” putting the best of the University’s research on stage around auditory, mind and music matters.

CCI’s prototype stage has now come to an end this month as the University partners with global developer Lendlease to take the project from 250 people to 4,000 + people working and living on the site by mid 2020 with a new building and spaces for people to collaborate and innovate. This next phase will build from the prototype as a place where ideas were born, tested and realised.

The CCI stories of serendipitous bump encounters that led to profound collaborations not to mention the strategic intentional partnering amongst tenants and with external stakeholders from government, industry and community were numerous and impactful. This narrative also assisted ensure a long waiting list of future tenants when the building expands and re-opens in 3 years’ time.

Like the saying “it takes a village to raise a child”, it has taken many steps, numerous people and impeccable timing for CCI to have been realised to date. It took leadership from not only the University’s senior management but the academy willing to be part of this ‘bold new experiment’. It has also took the state government foresight to ensure that this former hospital site was sold to the University as opposed to a developer keen to create more inner city accommodation for those that could afford inner city prices.

It is clear that the success of CCI’s LAB-14 prototype and the next phase relies on true collaborations between not only university and industry actors but also the community within which CCI acts as an anchor tenant. What has been well established in academic literature (e.g. from the 1850s economist Alfred Marshall to Michael Porter in the 1990s) is that location and proximity matters.

Further research from the Brookings Institution has also affirmed what CCI practised regularly- the importance of working at the hyper-local level. Not only does this garner goodwill with the neighbours and an authentic local voice but highlights that the grassroots level can be both the problem identifier and the problem solver. At CCI, we saw this on many occasions through not only local engagement in hackathons on ageing, big data and energy but also through “networking the networks”- i.e. enabling our start-ups to work with neighbouring institutions, like the Melbourne Biomedical Precinct. Having industry partners such as IBM and Australia Post in residence in LAB-14 also meant that start-ups could via the larger corporates meet some of their first customers and test MVPs through trusted networks and a culture that celebrated and fostered open innovation.

CCI is also now part of another broader ‘innovation district’- the Melbourne Innovation District (MID), which includes neighbouring university RMIT, the City of Melbourne and other complementary organisations within the area such as Red Cross, Oxfam and the Australia Conservation Foundation. This geographic area just north of the central business district is home to 21% (60,260) of all knowledge sector jobs in Melbourne. Creating the MID with key partners all whom are headquartered in this district means together we can co-create, co-design and co-deploy initiatives that enhance the public realm; support new systems and institutional design, and identify opportunities for digitally-enabled technology, social innovation and enterprise activation.

The ultimate goal for the MID is to contribute to a new and stronger innovation backbone for the Mel-
bourne-Victoria economy, generating and capturing public value and social impact. CCI is excited to play its part in this physically anchored innovation ecosystem via new jobs, new knowledge, and new networks that can equally enhance the collective value of MID.

With all good partnerships and ambitions, what is critical is to ensure that the aspirations and energies of those leading and participating are supported by technological and physical frameworks and infrastructure that facilitate and not impede. Further it is important that the narrative told is authentic with key messaging that we are “open for business”. Enhanced public transport including a new train stop will be extended into the MID district and it will coincide with another significant state led infrastructure project- a proposed heavy engineering precinct that will be part of the State’s new employment precinct (Fisherman’s Bend) which estimates 60,000 new jobs and 80,000 new residences over the next decade.

To conclude, it would be remiss to not highlight a special ingredient that not only engaged the local community with CCI but assisted articulate the research and scientific offerings that were explored at LAB-14. This was the creative tenants and partners with whom our “cultural animator in residence” curated a series of art exhibitions and performances that put our research and innovation on show in a fresh and engaging ways. Fresh thinking is crucial for innovation to occur and requires at its simplest diverse voices, participants and perspectives. Exhibitions such as this were at the heart of CCI’s work to create places and moments to allow for fresh thinking and contemplation on pressing issues of our time such as urbanization and city resilience, climate change and sustainability.

When CCI opens again in full it will enjoy new spaces, new partners and new opportunities that will grow from the ‘legacy seeds’ planted over the past 3 years. It will also include a 4000sqm Science Gallery that will offer young adults and the community a space to engage and explore the collision of art and science; challenging our understanding of science, art and innovation.

“Cities are only capable of providing for all, only when and only if, they are created by everyone”. Jane Jacobs, writer and social activist NYC.

The success and impact of CCI will only be well understood in years to come. CCI takes its signal from the courage and leadership of American Canadian writer activist Jane Jacobs as it strives to build a culture and place where innovation takes centre stage but never despite its public spirited core. This intention and sentiment is one that echoes the motto of the university in which it was conceived - “Postera crescam laude” - “to grow in the esteem of future generations”.

The success of CCI’s LAB-14 prototype and the next phase relies on true collaborations between not only university and industry actors but also the community within which CCI acts as an anchor tenant. Location and proximity matters.

JACYL SHAW is the Digital Innovation Lead at GHD Digital. Prior this, Jacyl was the Engagement Director of Carlton Connect Initiative.
According to Katz and Bradley [1], innovation districts are geographic zones that cluster and connect leading-edge anchor organizations (universities, R&D centers) and innovative firms with supporting and spin-off entities, business incubators, mixed-use housing, office and retail space, high-tech amenities, and high-quality public transportation, among other perks. The objective of such a location is to boost an ecosystem where knowledge, ideas, and financial resources interact in such an aligned manner that community wealth grows as synergies rise.

In most cases, the benefits of implementing these geographic areas are measured by the economic impacts they bring. These include indicators such as dollars invested, jobs created, anchor companies established, square feet constructed, and taxes paid, among others. However, the neighborhood vitality of these new or revamped communities is seldom estimated. Therefore, I propose to design and implement a neighborhood vitality index for innovation districts to complement the conventional economic indicators by also measuring the following broad categories: quality of jobs, wellbeing, green living, fairness, and quality of health.

**Neighborhood Vitality Indices**

In the United States, the Urban Institute led the creation of the National Neighborhood Indicators Partnership (NNIP). Within the NNIP, more than 20 cities in the US have developed systems for measuring neighborhood well-being [2]. Although each participating city developed its indicators considering the data collected, there are several comparable measures across all of them that provide valuable information for policymakers. Usually, participating towns collect indicators in several areas such as health, crime, demographic features, housing,
local economy, physical environment, and education, among others.

There are many additional initiatives around the world, such as the Cleveland Area Network for Data Organizing, the Neighborhood Statistics and the English Indices of Deprivation, both located in the UK, the Toronto Neighborhood Profiles Initiative, as well as dozens more in other countries.

What to do then?

Considering Fainstein’s Just City principles [3], I believe that city leaders need to examine other determinants of growth that complement GDP (or economic growth) to measure the success of innovation districts. A set of broad indicators that appears relevant is the one described by the New Economics Foundation [4].

First of all, there is a need to measure the proportion of jobs that pay as little as to afford a decent standard of living. Today, employment statistics only describe what portion of the population maintains a job. However, the quality and the possibilities it creates are not usually measured. This new information should be incorporated to execute plans that boost the demand for better-paid labor by improving the quality and relevance of education, developing appropriate public infrastructure, and attracting higher value-added companies to the area, among other actions.

Second, there is a need to estimate well-being as a function of how happy people are with their lives. The first step is acknowledging that enhancing the quality of life of all individuals in a neighborhood must be the final goal of any public officer.

Third, the area must estimate its lifestyle-related carbon emissions while contrasting them to the goals set in the Paris Climate Deal. In that sense, the United Nations [5] calculates that between 67 and 76 percent of all harmful greenhouse emissions come from cities. Consequently, promoting the use of renewable energy, efficient construction techniques, and zero-emission transportation, among other factors, are fundamental in developing a healthy community within innovation districts.

Fourth, there is an impending need to measure community fairness inside innovation districts. A study led by the International Monetary Fund [6] states that if the income portion of the top twenty percent increases, economic growth declines in the medium term, implying that all the population does not equally share the benefits of this growth. In contrast, a boost in the income share of the lowest 20 percent produces higher economic growth in the long term.

Finally, it is essential to consider the quality of health of the population, especially the relevance of preventive
health to avoid unnecessary deaths and diseases, as well as the current mental health situation.

**Product Management Breakout**

Considering the above, I am proposing the creation of a neighborhood vitality index that could be applied in any city’s innovation district, depending on the availability of information.

The following table defines the broad areas that need to be measured, as well as a possible source of information. Each innovation district is free to assign specific weights to each area, as well as to each indicator within each area so that it matches its social objectives.

Although in many cases urban planners have concentrated a large chunk of their efforts on economic development, there seems to be a need to address community wealth from a Just City perspective to provide more possibilities for all. In that sense, urban development projects should also aim to improve the quality of peripheral neighborhoods, and public investment and regulation should produce equitable outcomes, instead of just supporting those already well off.

Therefore, measuring the success of innovation districts using indicators that complement economic growth is vital for policymakers to define actions to prevent these areas from becoming dull business parks instead of vibrant and diverse urban neighborhoods. ■

**References:**


**ALEJANDRO DELGADO** is a project manager at RutaN in Medellin, Colombia. for the past nine years.
<table>
<thead>
<tr>
<th>Quality of jobs</th>
<th>Measures</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median Household Income</td>
<td></td>
<td>Census</td>
</tr>
<tr>
<td>Percent of income dedicated to:</td>
<td>Housing</td>
<td>Census / City Surveys</td>
</tr>
<tr>
<td>Food</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commuting time</td>
<td>City Information / Surveys</td>
<td></td>
</tr>
<tr>
<td>Resident's perception of job quality</td>
<td>Surveys</td>
<td></td>
</tr>
<tr>
<td>Non-resident perception of job quality</td>
<td>Surveys</td>
<td></td>
</tr>
<tr>
<td>Jobs in neighborhood by industry</td>
<td>City Business Survey</td>
<td></td>
</tr>
<tr>
<td>Perception of accessibility through public transportation</td>
<td>Transit Systems Survey</td>
<td></td>
</tr>
<tr>
<td>Numbers and types of job training programs</td>
<td>Worker's Survey</td>
<td></td>
</tr>
<tr>
<td>Well-being</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accessibility to: health care, child care, employment training, recreation, transportation, education, police, libraries, parks, sports facilities, museums, convenience stores, restaurants, family support</td>
<td>Residents Surveys / Institutional Surveys</td>
<td></td>
</tr>
<tr>
<td>Perceived quality of above services</td>
<td>Resident and Visitor Surveys</td>
<td></td>
</tr>
<tr>
<td>Perception of safety</td>
<td>Resident and Visitor Surveys</td>
<td></td>
</tr>
<tr>
<td>Residents' participation in neighborhood affairs</td>
<td>Resident Survey / Local event attendance statistics</td>
<td></td>
</tr>
<tr>
<td>Physical condition of public areas</td>
<td>Surveys / Observation</td>
<td></td>
</tr>
<tr>
<td>Perceived helpfulness of neighbors</td>
<td>Resident Survey</td>
<td></td>
</tr>
<tr>
<td>How Green?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality of air</td>
<td>City Open Data</td>
<td></td>
</tr>
<tr>
<td>Quality and consumption of water</td>
<td>City Open Data</td>
<td></td>
</tr>
<tr>
<td>Energy consumption per capita</td>
<td>Energy Company / City Open Data</td>
<td></td>
</tr>
<tr>
<td>Perceived amount (kg) recycled</td>
<td>Resident Survey</td>
<td></td>
</tr>
<tr>
<td>Perception of climate change effects/risks</td>
<td>Survey</td>
<td></td>
</tr>
<tr>
<td>Energy efficiency of buildings</td>
<td>Energy Company / City Open Data</td>
<td></td>
</tr>
<tr>
<td>Fairness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distribution of income</td>
<td>Census</td>
<td></td>
</tr>
<tr>
<td>Perceived diversity: races, cultures, ethnicity, food, arts, bars, genders</td>
<td>Resident and Visitor Survey Business Survey</td>
<td></td>
</tr>
<tr>
<td>Forced mobility of residents (Gentrification)</td>
<td>Survey of past residents</td>
<td></td>
</tr>
<tr>
<td>Change in home prices over time</td>
<td>Survey of past residents / Real-Estate Public Data</td>
<td></td>
</tr>
<tr>
<td>Health</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage insured</td>
<td>Residents Survey / Census / Department of Public Health</td>
<td></td>
</tr>
<tr>
<td>Percentage of residents that are overweight</td>
<td>Census / City Open Data / Department of Public Health</td>
<td></td>
</tr>
<tr>
<td>Perception of health conditions</td>
<td>Survey</td>
<td></td>
</tr>
<tr>
<td>Perception of healthy lifestyle</td>
<td>Survey</td>
<td></td>
</tr>
<tr>
<td>Perceived access to preventive health</td>
<td>Survey</td>
<td></td>
</tr>
</tbody>
</table>
China’s Emerging Innovation Hubs

If you ask nearly any CEO or mayor what their company or city’s greatest asset is, “people” is the word that most offer first. When people are skilled and engaged, they fuel continued growth, innovation, and wealth. Leaders therefore recognize that keeping the best talent can mean the difference between leading at the cutting edge and slipping into irrelevance. The globalized economy has given rise to more fluid flows of people, and today the world’s most influential companies and, by extension, the cities they are concentrated in compete for largely the same pools of workers and residents. The usual suspects like Silicon Valley, New York, and London continue to be enmeshed in that fierce competition, but a crop of emerging innovative cities are outpacing the rate of growth of these more established centers, and many of them are in China.

In a 2015 report published by real estate think tank Jones Lang LaSalle (JLL), five Chinese cities – Shanghai, Beijing, Shenzhen, Chongqing, and Wuhan – are named to the list of the top ten most dynamic cities in the world, joining London, San Jose, San Francisco, Boston, and Ho Chi Minh City. With half of these powerhouse cities concentrated in the world’s second largest economy, it is likely that their growth and influence will continue to accelerate. The dynamism of these cities stems not simply from sheer GDP growth, but from the speed of innovation. Startups and global conglomerates alike have recognized China as a burgeoning nucleus of the global innovation economy, and are investing heavily in its urban centers.

No Silicon Valley Carbon Copy
What has become evident when studying innovation districts in China is that they do not emulate the Silicon Valley approach and its urban design ethos (or lack thereof) to capture similar successes. To the contrary, China’s unique urbanity, concentrated density, and efficient transportation connections via a robust nationwide via high-speed rail network provides definitive advantages over Silicon Valley’s suburban, car-reliant, isolated experiences. In a recent New York Times Op-ed, one outspoken critic of Silicon Valley’s sprawl posed the critical question: “with so many studies touting the benefits of walkable, bike-able and transit-accessible environments, why are we designing in such a way that makes long, painful commutes inevitable?” But on the other side of the world, China has a rare opportunity to build urban, livable, and lively innovation hubs. China will no doubt borrow successful elements from many thriving tech districts around the world, but in doing so they will also create distinctly urban, culturally relevant, authentic districts that do not need to copy and paste to thrive.

Exposure, Not Isolation
In many respects, China’s thirst for new urban design ideas and its haste to implement them unapologetically illustrates the country’s ability to “learn from failure” that the Silicon Valley ethos purports to embrace. This mentality allows city planners and developers to implement ideas with a higher level of risk than their more conservative Western counterparts.
exciting example of this is the Yuqiao Innovation District in Shanghai. In many aspects, Shanghai is revered by peer cities around the world for its extraordinary growth, energy, and vibrancy. Despite this enviable reputation, however, it is a remarkably conservative city, having made its wealth via conventional business sectors including heavy industry, banking, and finance. Understanding the impact that disruption and bold new ideas are to remaining relevant in a competitive global marketplace, Shanghai is attempting to reinvent itself as Asia’s innovation capital. In 2014, President Xi Jinping tasked Shanghai with becoming a “globally influential center for technical innovation.” As a result, 3.8% of the city’s GDP was earmarked for R&D, with the goal of having “strategic new industries” responsible for 20% of GDP by 2020. The master plan for the Yuqiao Tech District is a direct result of Shanghai’s amplified focus on becoming a global tech leader. Located in the city’s Pudong District near Zhangjiang – the epicenter of Shanghai’s science and technology scene – Yuqiao is advantageously situated on a metro line, providing a critical transit link to downtown.

Programming strategies were intentionally considered to allow for information exchange, the cross-pollination of ideas, shared work spaces, and forums to exhibit and demonstrate results. By designing spaces that promote synergy and the deliberate mix of disciplines to represent diverse perspectives, start-ups are linked to venture capital, production, and other related business to allow for efficiency in both investment opportunities and tactical support. The open space at Yuqiao not only creates a continuity of active parks, streets, and plazas, but also reflects and complements the activity and energy happening within the buildings. Delineations between public and private space are deliberately blurred, allowing the street and other outdoor spaces to be used for work, recreation, display, and social interaction. Industries within Yuqiao reflect this diversity, with program ranging from traditional office and retail services to cutting edge live/work maker space and light manufacturing. Architecturally, an inventive solution for the urban block typology advocates for transparency and cross-pollination, with circulation routes punctuating spaces that traditionally would have been enclosed. This approach celebrates the importance of the public realm as something not only relegated to the outdoors, but as a powerful tool to unite people and ideas.

Collaboration between Universities and Homegrown Companies are Fueling Growth

Before its more recent focus on technology, the economy in the central Chinese city of Wuhan relied almost exclusively on iron and steel. In 2011, Wuhan committed to an “industry multiplication” plan to expand into new economic sectors. As of 2016, five 100-billion RMB industries had taken root, spanning automobiles and parts; electronic information; equipment manufacturing; food and tobacco; and energy and environmental protection. This extreme regional growth is fueled by Wuhan’s powerhouse educational institutions. Wuhan lays a claim to having one of the world’s largest populations of students, with nearly one million students enrolled in higher education. This is nearly as many as in Greater New York and Greater Los Angeles (1.3 million and 1.1 million respectively. The academic and research environment offered by such an enviable concentration
of universities is an asset that companies the world over recognize as a driver of new ideas and innovation. It’s no coincidence that the Cambridge, Massachusetts biotech hub in Kendall Square is located adjacent to Harvard and MIT - two of the most robust academic networks in the world. In kind, Wuhan is primed to develop into a research and industry innovation mecca with nearly 80 universities on-hand to fuel companies seeking R&D partners.

Wuhan’s impulse to quickly accelerate research cluster development is tempered by a savvy recognition that the urban fabric must also be thoughtfully crafted to ensure a lively ecosystem flourishes alongside the new businesses and partnerships cropping up. In 2012, the Chinese tech-giant Lenovo decided to locate its R&D center to Wuhan, investing 16 billion RMB in the effort. They invested not only in infrastructure, but also in a plan to cultivate a flexible plan to evolve its land assets alongside the growing needs of the company, the research district, and the city. In 2016, Lenovo embarked on a planning process to identify how best to cultivate their two-square-kilometer lakefront parcel. The site is surrounded by seven universities, and research campuses belonging to global tech giants including General Motors, Alibaba, Tencent, Baidu, and Lenovo’s sister company Raycom. The Lenovo campus also includes a mixed-use program that responds to the natural assets of the site and supports a vibrant core of talent living and working adjacent to the district. Diverse landscapes are embedded throughout the campus, providing plenty of walking meeting space for busy executives on the move, private decision-making spaces for angel investors to meet with startups, co-working spaces for peers to mingle, and a mix of retail and dining options for visitors and the local community. For Wuhan specifically, maintaining the shorelines of its many lakes as public amenities while balancing market demand for new residential and commercial development will be crucial to preserving people-oriented cityscapes that entice world-class companies and their sophisticated talent to choose the city as a home base.

Technology and Ecology: A Win-Win Scenario for Attracting Talent

Back in Shanghai, the vision for a new technology district on Fuxing Island in the city’s Huangpu River encapsulates the most forward-thinking approaches to two of the world’s most pressing issues: creating a stable and regenerative economic environment and eliminating the negative environmental impacts of an increasingly developed world. Envisioned as mixture of an innovation district and a destination urban waterfront, the development is physically, intellectually, and symbolically linked to nearby Fudan, Tongji, and other highly esteemed universities. Strong links to these institutions will help to attract and retain some of the brightest minds in the country to work in the corporate campuses, business and training schools, and incubator industries envisioned for the island. The plan for the district envisions a mixed-use environment that combines these research and development uses with residential neighborhoods and a vibrant waterfront. The motivation for focusing on a mixed-use program is to attract a new generation of creative class that will live and work on Fuxing Island. These global millennials crave experiences that can only be supported by a diverse, mixed-use
community that provides opportunities to share ideas and cultivate new ones. To that end, cultural experiences are critical to help keep these creative ideas flowing, and interactions with nature are necessary to relax and recharge. Fuxing Island’s location on the banks of the city’s Huangpu River provides the vibrant urban waterfront includes space for retail, restaurants, entertainment, museums, and theaters that tech workers demand. These urban amenities are integrated within the fabric of former warehouses and shipbuilding facilities, allowing for the adaptive reuse of existing structures while retaining the industrial aesthetic and cultural history of the island.

The innovation hub at Fuxing Island also seeks to go beyond creating just a collection of green buildings. Fuxing Island’s natural features also draw upon the existing landscape structure of the island, with an existing park at the center of the island expanded to create a central green. The Fuxing Canal, which separates the island from the mainland, is planned to undergo restoration, which reimagines it as a recreational amenity, with filtering wetlands at both outlets to the Huangpu to help naturally cleanse polluted waters. Finally, green roofs and biofiltration zones are also planned extensively throughout the development, utilizing native plants and soil microbes to remove surface pollutants and contaminated soils on this brownfield site. This approach not only makes Fuxing Island desirable to companies that are in tune with their carbon footprint, but also speaks to a characteristically altruistic tech labor force that knows this is environmentally the right thing to do.

Thinking Beyond Traditional Tech

Innovation goes far beyond researching flexible screen technology or developing the next app. At its core, innovation is attempting to solve the problems of humanity. Similarly, environmental responsibility goes far beyond simple ecological restoration of formerly degraded sites, and contemporary tech workers are much more attuned to all aspects of resiliency, down to the food that they eat. At the Sunqiao Urban Agriculture Innovation District, also in Shanghai, researchers are embarking on solutions to feed an ever-urbanizing planet. Located between the international airport and the city center, Sunqiao illustrates that, like the city’s soaring skyscrapers, its farms are also going vertical. After 20 years of conventional agricultural production on the site, Shanghai is expanding the role of Sunqiao in its foodshed. The plan for this unique agriculture-focused innovation district focuses on the integration of vertical farming systems in conjunction with research and public outreach.

Shanghai is the ideal context for vertical farming. Like many global cities, land prices are high, which makes building up rather than out the economically prudent choice. Even more significant is the Shanghai diet, which consists of up to 56% leafy greens including spinach, lettuce, and kale. Leafy greens are an excellent choice for hydroponic and aquaponics growing systems. They thrive in the simplest of set-ups, and don’t need a lot of extra attention. They grow quickly and weigh little, both of which make them an economical and efficient option. Although most of us in the Western world think of the ‘Made in China’ economy as being driven by manufacturing, China is actually the world’s largest producer and consumer of agricultural products. In fact, the agricultural sector represents approximately 13% of China’s total Gross Domestic Product. In the United States, agriculture accounts for about 5.7% of GDP. Agriculture in China is also responsible for feeding 20% of the world’s population and employing 22% of Chinese citizens. Sunqiao not only can feed the country’s urbanizing population, but will fuel its economy. New industries that benefit from access to agriculture—biotech, textiles, etc.—are thriving. With land prices making traditional horizontal farming an endeavor with little room for profit, Sunqiao illustrates how the Chinese government’s strategy of preserving land for agricultural purposes can also provide a higher and better use. This approach actively supports a more sustainable local food network while increasing quality of life in the city through a community program of restaurants, markets, a culinary academy, and pick-your-own experiences—again, all elements that help to attract the world’s best talent. As cities continue to expand, we must continue to challenge the dichotomy between what is urban and what is rural. Sunqiao seeks to prove that you can have your kale and eat it too.

Sustained Potential

Although China’s innovation districts are still very much emerging, make no mistake that they will rival some of the most established global knowledge hubs. The key to their long-term success will be China’s ability to continue to innovate, establish new global trends instead of emulating them, and attracting the best minds from beyond its borders. This will only happen with radical change to government policies that make China more welcoming to those who see a future in a free and just society that values diversity of thought. Perhaps this is China’s next big innovation.■

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MICHAEL GROVE is the Chair of Landscape Architecture and sits on the Board of Directors at Sasaki, a global design firm with offices in Boston and Shanghai.

AS CITIES CONTINUE TO EXPAND, WE MUST CONTINUE TO CHALLENGE THE DICHOTOMY BETWEEN WHAT IS URBAN AND WHAT IS RURAL. SUNQIAO SEEKS TO PROVE THAT YOU CAN HAVE YOUR KALE AND EAT IT TOO
esearch commercialization, often referred to as technology transfer, was not so long ago viewed as a periphery service function within most universities. As the vast majority of technology transfer operations rarely generate more revenue than costs, they have often been subject to the whims of budget cuts and typically viewed with indifference as a component of institutional strategic planning. Fast forward to today where increasingly advanced economies are facing the reality that they must successfully compete in the knowledge economy where the emphasis on talent development and translating research investments into new and disruptive products and services is rapidly replacing the importance of low labour rates and preferential tax policies to drive sustainable job growth. Thus, increasingly universities are being challenged by their governments, citizens, and national private sector interests to develop effective commercialization and entrepreneurship skills development programs to adjust to the new economic realities. Not surprisingly, entrepreneurship and commercialization capacity development have steadily become core features of most university strategic plans these days. ▶
The University of Waterloo, located in Waterloo, Ontario, Canada, has over its 60 years of maturity invested in unique, and once considered unconventional, teaching, research, and industry engagement strategies and programs. Today the University of Waterloo is widely acknowledged as the most innovative university in Canada. This reputation is largely rooted in three mutually synergistic core operational activities that have contributed to a pervasive entrepreneurial campus culture.

Firstly, the University has a creator-own IP policy, also referred to as “professor privilege” that serves to attract and incentivize entrepreneurial minded faculty and students. Secondly, the University operates the world’s largest cooperative education program, placing 20000 students annually across 6300 international employers. Students participate in experiential learning experiences across 4 employment placements which provides them a unique insight into industry problems, which if they can solve, represent a wealth of potential startup ideas and opportunities. Lastly the University has invested in a multi-layered commercialization support infrastructure that supports each of undergraduate, graduate, and faculty innovators.

In addition to providing traditional technology transfer commercialization support for faculty driven research discoveries via the Waterloo Commercialization Office (WatCo), the University also supports the world’s largest free student focussed business accelerator (Velocity) offering an integrated program of entrepreneurship training and professional business mentorship. Further, the University has developed and
integrated entrepreneurship training in undergraduate through to graduate level curriculum. For instance the Masters in Business, Entrepreneurship, and Technology (MBET) graduate studies program brings teams together to develop business ideas that are supported by entrepreneurship courses, mentoring, and active participation in global business plan pitch competitions. Approximately 50% of MBET graduates start a business one month after graduation compared to 7% of MBA grads form the Top 7 elite US universities [1]. This blend of mutually supporting entrepreneurship and commercialization infrastructure has supported the creation of more than 200 start-ups raising in excess of $600M in investment since 2008 and has positioned the University of Waterloo to rank 20th globally (#1 in Canada) for the number of VC-backed entrepreneurs [2].

Complementary to the University’s commercialization infrastructure is the support offered by three independent accelerator centres located in the Waterloo Region that provide physical space and mentoring programs to assist start-ups to become investment ready and to scale their business models. According to the Compass group [3], “Canada’s Waterloo Region solidly ranks among the top 25 start-up ecosystems in the world, boasting approximately 1,100 start-ups for a population of about half a million people—the second highest start-up density in the world after the global leader, Silicon Valley”. This infrastructure is responsible for the Region achieving a 5 year start up survival rate of 80% compared to the global average of 43%.

This concentration of Waterloo entrepreneurial activity contributes significantly to the Toronto-Waterloo innovation supercluster region (110km), which supports Canada’s highest combined equity valued technology companies [4] and employs 205,000 high tech workers, 2nd only to Silicon Valley in North America. The Toronto-Waterloo supercluster region has also recently been the beneficiary of significant government investments in AI and Advanced Manufacturing research. The new disruptive technologies arising from this research concentration will continue to fuel the expansion of Waterloo’s entrepreneurial and commercialization ecosystem to achieve higher levels of company formation and attracting and retaining high tech talent. ■

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SCOTT INWOOD is the Director of Commercialization at the University of Waterloo.
Established in 1963 and headquartered in West Philadelphia, PA, the University City Science Center (Science Center) is not only considered to be the first and the oldest urban research park in the United States, but is also presented as one of the pioneers of the business incubator model. The non-profit organisation is located adjacent to the campuses of University of Pennsylvania and Drexel University as part of an urban renewal zone assigned in the 1950s. Since then, the Science Center has grown considerably to include fifteen buildings on a 70,000m² campus, evolving into an innovation intermediary to fuel the region’s innovation-based economy.

Over the past 55 years, the Science Center has catalysed entrepreneurship and research commercialisation from the idea stage to the IPO, and beyond. Since its inception, 442 companies mainly in the life sciences, health IT, and emerging technologies have benefited from the Science Centre’s business incubation services, with 214 of them still active. The impact of the 155 businesses based in Philadelphia that have ‘graduated’ from the Science Center was reported to have reached nearly $13b in annual economic activity in the Greater Philadelphia in the year of 2015, an amount that accounts for 2.2% of the region’s total economic output. To add, these businesses directly employ 12,000 people in the high skilled and high-wage category, with an average salary of $103,000 which is nearly double the region’s median annual wage of $52,000.

In addition to their major activities clustered around business incubation, the Science Center is a leading actor in the region with community building, education and...
workforce development as well as real estate management in efforts to provide a platform for cultivating and enriching the innovation ecosystem in Greater Philadelphia.

Infrastructure for innovation

The Center acquired ‘Unit 3’, its first property, from the government authorities to start its research, property development, and programme activities over 50 years ago. In the 1960s, the Science Center was granted one of the five units in the West Philadelphia region as redeveloper as part of a project implemented by West Philadelphia Corporation, and the Philadelphia Redevelopment Authority, with the remaining units allocated to the University of Pennsylvania and Drexel University. Government-supported research projects assigned to the organisation from the very moment of its inception enabled Science Center to begin constructing its first entirely new building.

After gaining financial stability in the 1970s and a push by the 1990s’ reviving economy, the Science Center started to flourish as an engine of economic development in the region. By the 2000s, it became a hub for entrepreneurs launching businesses in the areas, i.e. life sciences, clean tech, IT, bioinformatics, and nanotechnology, accompanied by the construction of new office spaces, labs, and other physical facilities that host new initiatives developed by the organisation. Campus development is still one of the priorities of the Science Center, in cooperation with Wexford Science + Technology, as well as community development, and education and workforce development particularly targeted to the disadvantaged communities in West Philadelphia.

There are currently 15 buildings in the Science Center Campus reserved for office, lab, retail and residential purposes. Joining forces with Wexford Science + Technology, the Science Center is further expanding its physical campus - rebranded as uCity Square - which encompasses a total of more than 100,000m². The project will add nearly 400,000m² of office, lab, residential and retail to expand the existing mixed-use community where businesses meet talent, research, and urban amenities. The 10-15 year growth plan will do justice to its status as ‘Philadelphia’s innovation corridor’. The area is planned to be a mixed used community comprised of offices and lab space for companies of all sizes, while attracting more residents and neighbours to the area with pedestrian-friendly shopping streets, apartment towers, and a public plaza. The Square will act as a linchpin that connects the neighbourhoods in the north and west with the rest of University City, in efforts to find pathways to access and inclusion.

Public spaces

Investments in the infrastructure do not only influence the performance and impact of the companies, but they also help instigate a culture of innovation and change in the local community. Some of the examples include the uCity Square community gathering spot Innovation Plaza, a pocket park with free Wi-Fi, chess

THE IMPACT OF THE 155 BUSINESSES BASED IN PHILADELPHIA THAT HAVE ‘GRADUATED’ FROM THE SCIENCE CENTER WAS REPORTED TO HAVE REACHED $13B IN ANNUAL ECONOMIC ACTIVITY IN 2015, AN AMOUNT THAT ACCOUNTS FOR 2.2% OF THE REGION’S TOTAL ECONOMIC OUTPUT. TO ADD, THESE BUSINESSES DIRECTLY EMPLOY 12,000 PEOPLE WITH AN AVERAGE SALARY OF $103,000

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tables and green spaces, with the Innovators Walk of Fame that honour regional entrepreneurs, with names selected and added every other year as part of a biannual contest. Innovation Plaza is a vibrant space that offer a place of interaction and connection, and supportive environment for the development of a creative culture. Established in 1976, Esther Klein Gallery (EKG) in the campus enriches the cultural life of West Philadelphia and the broader community via exhibitions, artist talks, panel discussions, performances and special events.

Entrepreneurial community building
The Science Center facilitates a thriving entrepreneurial community in the Greater Philadelphia area to nurture innovation, by bringing together stakeholders from diverse sectors of the innovation ecosystem, i.e. researchers, academic administrators, entrepreneurs, public and private investors at a central gathering space. Quorum - ‘the entrepreneur’s clubhouse’ is where the members of the region’s entrepreneurial ecosystem come together to learn, share, and generate new ideas. Every year, the space attracts more than 8,500 people who benefit from the co-working lounge and Quorum Signature Programmes that are designed to connect entrepreneurs to investors. Some of the programs include, e.g. Coffee & Capital, the monthly programme that matches entrepreneurs to investors in an informal environment, Entrepreneur in Quorum, where two entrepreneurs host monthly open office hours for the start-up community over the course of a year, and Lunch for Hungry Minds, a monthly seminar on regional academic research in a range of fields.

Education and workforce development
One of the core missions of the Science Center is building future workforce specialised in STEM fields. This mission is pursued through educational initiatives of the organisation that target young minds. FirstHand is a unique programme launched by the Science Center to engage students in the STEM disciplines of Science, Technology, Engineering and Math, combined with Arts (STEAM), through hands-on projects and real-life lab experiences. Programme participants find the opportunity to work together with scientists and researchers at Science Center companies, as well as re-
ceiving mentorship from professionals and being exposed to different career fields. FirstHand Lab is a dedicated lab space designed as a safe and innovative environment for students to experiment and participate in hands-on projects. The lab, which is based in the midst of an incubator facility, is equipped with lab benches, sinks and cold storage, laptop stations, a laser cutter, drill press, whiteboards, and projectors. Serving local youth from under-resourced schools, and the teachers and professionals from their communities is seen critical to engage students with the STEM subjects and promote opportunity in the region in the long term.

Local community revitalization

Despite the transformative developments in the University City, local neighbourhoods struggle with poverty. According to the information from University City District, 31% of West Philadelphia’s population lives below the poverty level, with an unemployment rate that is significantly higher than the citywide rate. The Science Center tackles this economic disparity via West Philadelphia Skills Initiative (WPSI), a joint effort among Drexel University, the University City District and the Science Center. In March, the partnership received $5 million grant from Lenfest Foundation with the goal of placing 600 previously unemployed residents with the Philadelphia employers who are challenged by unfilled or high turnovers. Partners of the initiative involve employers, funders, and training providers who develop customised solutions to workforce development. In close collaboration with employers who commit to the program, the WPSI designs recruitment, selection and training activities for individuals who are currently unemployed, within a model that incorporates on-the-job training, technical skills, and soft skills.

The Science Center is one the oldest urban research parks in the United States that still remains to be one of the major actors of business and social innovation. As an innovation intermediary, they continue to fuel the region’s innovation-based economy and establish a strong stakeholder and community base that allows them to adjust to changing circumstances. It is this strong base and diverse revenue stream that contributes to the notable success of the Science Center, and provides a clear pathway forward.

by Arno Meerman

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AMS Institute: How the City of Canals Braces for its Urban Challenges

Selected as the ‘European capital of Innovation’ in 2016, Amsterdam does not only host a well-connected innovation ecosystem and a creative industry with a number of corporate headquarters, but also hosts leading scientific institutions that pioneer in generating solutions to the most challenging urban issues.

One of the unique examples of such institutions is Amsterdam Institute for Advanced Metropolitan Solutions (AMS Institute), led by a consortium of three academic partners, as Delft University of Technology (TU Delft), Wageningen University & Research (WUR) and the Massachusetts Institute of Technology (MIT), together with a diverse range of local, national, and international industry partners some of which include IBM, KPN, Shell, Waag Society, and Alliander to lead the change happen in the city. Powered by the research, teaching, and technological capabilities of these mix of organisations, AMS Institute aims to become a leader in urban innovation, using technology to resolve and navigate city flows, with which they refer “water, energy, waste, food, data, and people”.

The history of the AMS Institute dates back to 2010, when the city of Amsterdam launched a €50 mil call for proposals for a technological research institute for metropolitan solutions. AMS Institute was announced as the winning consortium qualifying for the financial support of the city of Amsterdam for the following 10 years.

‘Roboat’ (p.52) is one of the most ambitious projects led by AMS Institute in collaboration with the Massachusetts Institute of Technology (MIT), labelled as the world’s first major research program on autonomous floating vessels in metropolitan areas. This five-year program with a budget of €25 million brings together researchers from TU Delft, WUR, and MIT to discover the possibilities Roboat could offer, creating a dynamic new infrastructure, including options such as environmental sensing and forming temporary on-demand bridges.

Another project AMS Institute is working on is the MX3D’s production of a 3D printed steel bridge in Amsterdam canals, in collaboration with The Alan Turing Institute who will fit sensor networks on the bridge to perform real-time ‘health’ monitoring. In this constellation, AMS Institute will visualize the data and connect it to other sources of environmental data in the Metropolitan Area of Amsterdam. Except the two, there exists over 70 research projects, through which the institute continuously develops and tests solutions in the city as a test bed, involving Amsterdam citizens as testers, users, or co-creators.

Against this structural and operational backdrop, what are the working principles of the institution that facilitate implementation of simultaneous
joint programs and dynamic flow of information among the stakeholders?

The activities of AMS Institute is built on three main pillars: Education, Research & Valorization, and Value Platform. By taking an integrated approach among these pillars, AMS Institute guarantees that talent is educated on topics that really matter and are connected to labour markets, researchers build on the latest knowledge and technology, and by working with companies, governments and citizens, the research stays connected to real world questions and challenges, and results are implemented in Amsterdam and exported over the world by existing companies and entrepreneurial talent. When each of these pillars are considered, AMS Institute aims to achieve the cycle of development and implementation by (i) a broad range of educational activities, including the introduction of the innovative master program Metropolitan Analysis, Design and Engineering (MSc MADE) – live since September 2017 - that targets top students from all over the world, (ii) identifying a portfolio of research and valorization projects defined and executed by consortia of knowledge institutes and companies e.g. Accenture, Alliander, IBM, Shell, WaterNet, and (iii) a value platform that combines infrastructures, knowledge and networks, e.g. Amsterdam Smart City, KPN, Waag Society to enable its education, research and valorization activities.

particularly the education pillar offers a range of opportunities for traditional and non-traditional students in their development and implementation of metropolitan solutions, through combination of innovative education and real practice. Students, industry professionals, and government officials are welcome to attend the educational program, developed and delivered by TU Delft, WUR and MIT. The mode of learning combines face to face teaching and MOOCs, supported by summer schools for the practical, hands-on component of the program. The academic and partner organisations of the institute organized the interdisciplinary 2017 Summer School “Making the Metropolis”, which was attended by 70 graduate students and young professionals from 29 different nationalities. The students participated in an 8-day think-tank program to find answers to the urban challenges for the development of the Haven-Stad area. More, the graduate education program of AMS Insti-
Institute invites MSc students from TU Delft and Wageningen University to have an interdisciplinary AMS thesis study, providing them the research and design cases, facilities, and stakeholder collaboration opportunities they desire.

In addition to the educational activities, some of the completed and ongoing research projects include:

- **Social Urban Data Lab (SUDL):** With modern-day cities come vast quantities of data from online social activity. These data reflect how people interact with the urban environment and with each other. The more knowledge we can derive from social urban data, the better we can address real-life urban and regional challenges. The Social Urban Data Lab (SUDL) employs complex datasets from diverse sources to discover knowledge about urban interactions. In paving the way to more intelligent cities, SUDL develops state-of-the-art technology for the acquisition, integration, enrichment, analysis, and visualization of urban big data, making their monitoring and interpretation easier for data-driven urban analytics, planning, decision-making, transport and social science research.

- **Allegro (2015-2020):** targets developing a comprehensive understanding of pedestrian’s and cyclist’s behaviour in cities, in which different behavioural levels, concerning walking and cycling operations, activity scheduling and travel behaviour and knowledge representation and learning will be covered.

- **R-LINK:** R-LINK explores how small, bottom-up initiatives in urban area development can contribute to solving social issues and help create vibrant and inclusive urban regions. Taking a closer look at how strategic urban ambitions and social challenges can be realized, while simultaneously deploying community-linked incremental urban development through new alliances between public, market participants and authorities.

- **AAMS (Amsterdam Atmospheric Monitoring Supersite):** Amsterdam is facing several challenges concerning the quality of its urban environment. Expanding Amsterdam’s meteorological network and monitoring a wide scope of variables, AAMS sets out to increase the understanding of local weather, climate and air, to help improve citizens’ health, air quality, and local hydrology.

  - **Saving Energy** when others pay the Bill aims to help stimulate energy conservation in situations where people don’t pay for their energy bill, by studying a series of field experiments, and potentially positive effects of non-financial incentives and technological innovations on energy saving behaviour.

Finally, AMS Institute ensures the involvement of the citizens in the research and testing phase of the projects implemented. One of the more recent events that took place as part of the research “Het Schone Waterexperiment” in the summer of 2017 attracted 250 Amsterdammers who joined water researchers from Deltares, Wageningen University, KWR, Waternet, AMS Institute and artist Pavêl van Houten to test the quality of waters in the canals, ditches, and ponds throughout the city. The participation of the citizens in the testing process allowed performance of over 1000 measurements and mapping the quality of the water. Via this exercise, the project has contributed to citizen sensing and empowerment, which is essential for the development of an adaptive and resilient city.

Without doubt the city of Amsterdam provides AMS Institute an excellent context to operate both in top-down and bottom up manner that facilitates the innovation anchor into the city. Being part of the ‘European Network of Living Labs’, Amsterdam is a location with broad sociocultural diversity of citizens who are enthusiastic about experimenting and co-creating together with researchers, companies, and public institutions. This competitive advantage, combined with an excellent student pool, researchers, and the devoted public and private partners of AMS Institute will ensure the wide impact of its outputs, and carry the status of the city of Amsterdam among the smartest cities of the globe.

For more information on the projects and activities of the AMS Institute, please visit www.ams-institute.org/.

by Hacer Tercanli
We live in an era where the need for geographical proximity is greater than ever for successful innovation. The fate of the regions is no longer determined by the success of a single industry, but through cross-sectoral collaboration, open innovation, and authentic public interaction. Isolated production facilities and traditional office buildings are being slowly abandoned for fluid and flexible spaces in the vibrant urban centres, including universities working on to find solutions how to physically locate and culturally weave themselves into the urban fabric. The knowledge-led economy requires leading regional institutions and companies with their workforce to cluster and connect with start-ups and incubators, and transfer knowledge and ideas quickly in close proximity. After all, innovation is a social process that takes place in collaborative environments, where people share skills and ideas as they work and socialise together.

This approach to innovation has been acknowledged in the recent work of Brookings Institute and their Initiative on Innovation and Placemaking who have labelled these hubs as ‘innovation districts’. Their work on this has since 2014 resulted in a wide range of research reports and case studies, with their most recent publication being a how-to-guide on assessing innovation districts [1]. The guide outlines a solid framework with 5 interconnected elements to be used for innovation ecosystem asset audit, by public and private leaders. In the context of Europe the discourse has been revolving...
around major policy initiatives and corresponding projects, all contributing to the development of place-based innovation ecosystems.

From a global perspective, innovation districts are largely clustered in North America and Europe, followed by those in Australia, (e.g. Sydney Westmead, Macquarie Park, Melbourne Innovation District), Asia (e.g. New Town Kolkata, Singapore Jurong Innovation District, Hong Kong Innovation Node), Latin America (e.g. Medellin), and in the Middle East (e.g. Tel Aviv Silicon Wadi).

What’s in in Europe?

European initiatives focusing on sustainable urban design as a path to regional innovation dates back to 1990’s. In the case of Barcelona (El Poblenou), Eindhoven, and Helsinki-Espoo, the cities have risen from their ashes after severe economic crisis, through strong collaboration between public, private and knowledge sectors in their respective regions. Other European cities have been experimenting with the trend as well, e.g. London (Knowledge Quarter), Stockholm (Kista Science City), Berlin (Silicon Allee), and Rotterdam (Innovation District), each contributing to the development of larger innovation ecosystems in different ways. These cities to a large extent meet the three preconditions that matter to the development of successful districts: economic assets, e.g. research-intensive companies, universities, physical assets, e.g. coworking spaces, parks, plazas, and networking assets, that refer to the relationships between actors to generate and accelerate development of ideas. The ‘innovation ecosystem’ only emerges when availability of these assets meet with a supporting, risk-taking culture[2].

Since its official launch in 2000, 22@Barcelona has inspired different cities around the world, including e.g. Medellin (Medellinovation Innovation District), and Montreal (Innovation District) as an international economic and social transformation benchmark model. In its first 10 years, the number of companies has grown twice as many (almost 110%), and excluding freelancers, number of workers has increased 63%, as well as the project being recognised by as many as 60% of Barcelona residents. Whilst the development of the El Poblenou neighborhood has been driven by the City Council, the regional universities, e.g. Pompeu Fabra University, University of Barcelona, Polytechnic University of Catalonia and the Open University of Catalonia are heavily invested in the project, in the construction of diverse technological centres and company incubators [3]. Cited as ‘the most intelligent region in the world’ by the American think tank organisation The Intelligent Community Forum, the Dutch city of Eindhoven established its High Tech Campus - and further consolidated the efforts by establishing Brainport Eindhoven Foundation, chaired by Eindhoven’s mayor Rob van Gijzel, to constantly improve ‘brainsharing’ and improving relationships between the members, including the tech giants Intel, IBM, Phillips Research, and the Technical University.
IN PRACTICE

'lagging' regions, key components that underlie urban innovation support, with in some cases the efficient use of resources. Gathering operational insights in the short term and ensuring developing neighbourhoods as testbeds, these cities can deliver services more efficiently. Taking one step at a time, and focusing public networks, ICT and e-services to manage their government and businesses) developing and integrating strategies, by collaboratively (local residents, academia, businesses, and other stakeholders) developing and integrating ecosystems. The case study report [6] published the same year by JRC particularly focuses on the role of a higher education institution, Aalto University, in the facilitation of a unique ecosystem in the Helsinki region developed as Espoo Innovation Garden.

While there is strong policy support, and diverse number of blueprints and strategic documents published on the subject, until recently the support has not focused on the "how" to translate these policies into action. The Innovation Camp Methodology Handbook [5] published last year by the Commission aims to address this gap and support stakeholders in the implementation of their RIS3 strategies. The handbook adopts the Aalto Camp for Societal Innovation (ACSI) methodology to be applied in the design and implementation of place based regional innovation strategies, and serves its content as a "cookbook", for regional and urban policy makers, quadruple helix actors and experts who set out to create their own ecosystems. The case study report [6] published the same year by JRC particularly focuses on the role of a higher education institution, Aalto University, in the facilitation of a unique ecosystem in the Helsinki region developed as Espoo Innovation Garden.

These promises of urban growth also prepares the regions to adopt smart city technologies, as argued by Horn [7], allowing cities to "test different pieces of smart technology, pick and choose the best options, and scale them through the rest of the municipality”. Involved in the European initiative of Smart Cities and its instrument programs, many cities are now pursuing smart city strategies, by collaboratively (local residents, academia, government and businesses) developing and integrating public networks, ICT and e-services to manage their services more efficiently. Taking one step at a time, and developing neighbourhoods as testbeds, these cities can gather operational insights in the short term and ensure efficient use of resources.

Role of European Universities

The challenge arises as European regions vary greatly in their capacities of innovation support, with in some ‘lagging’ regions, key components that underlie urban development is not fully present. This is due to several factors, including the weak knowledge generation capacities of universities, insufficient absorption capacity of local businesses, or simply lack of leadership in the region to facilitate collaboration among key actors. Within this context, European universities can play a pivotal role as orchestrating actors, by capitalising on their knowledge and human resources, and help create new businesses via start-ups and spin-offs, foster innovation via industry R&D cooperation, and extend their services to the direct benefits of the local community.

While undertaking these tasks, universities should mobilise their existing resources strategically, and first help identify the innovation assets of their regions focusing on the competitive distinct advantages. In the case of RIS3 strategy development, universities can achieve this by initiating and participating in the Entrepreneurial Discovery Process (EDP), and collaboratively identifying potential opportunities with local stakeholders. When regional and institutional commitment is ensured, European universities will not only play a greater role in regional innovation via EDP, but also in the translation of these processes into sustainable urban development initiatives.

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HACER TERCANLI is the project officer at University Industry Innovation Network
Right UBC Structures for Strengthening Innovation Ecosystem

"History is wisdom – future is challenge" – the motto of Gdansk University of Technology (GUT) is reflective of this current trajectory to combine respect for tradition, with its commitment to innovation via well-designed public private interaction. One of the oldest and largest higher education institutions in Poland, GUT emphasizes quality, innovative progress and strategic cooperation as its vision.

For centuries of long-established tradition, institutions of higher learning were closed communities of teachers and scholars. Nowadays, the complexity of social and technological challenges encourages the older universities to refine their developmental path beyond traditional confinement. From branding to internal policies adopted, and enabling infrastructures established, this tide of change towards external engagement and social impact reflects itself in many facets of universities around the world.

As an example, Gdansk University of Technology emphasizes quality, innovative progress and strategic cooperation as its vision. It responds to the local human resource demands by training highly qualified engineers, and strategizes university-business cooperation (UBC) by engaging in innovative R&D activities.

Introduced in 2012, the current developmental strategy of the university has placed new structures to further encourage UBC and technological commercialization activities of GUT. Newly established Center for Knowledge and Technology Transfer (CKTT) and Excento Special Purpose Vehicle (SPV) are the two major support mechanisms of this process.

An intermediary between the researchers and the entrepreneurs, Center for Knowledge and Technology Transfer connects capable academic teams and the businesses in need of innovative solutions, facilitates the search for financial resources and provides the guidance in licensing, patenting, and protection of intellectual property. With these responsibilities, CKTT also supports the spin-off companies that implement the innovation developed in the campus. Complementarily, Excento Special Purpose Vehicle assists indirect commercialization and development of the promising projects. Beyond their individual roles in the ecosystem, CKTT and Excento SPV are well aligned in their activities; they have a common board that brings about close collaboration between the two units.

GUT’s dedication to productive science and business interaction has translated into creation of five science centers and six regional technological clusters. The centers and clusters have been recognized as important promoters of UBC in the region. For example, Interizon Pomeranian ICT Cluster, coordinated by GUT, connects around 140 entities from electronics and telecommunication industry with local universities. This rich collaborative network has received a number of national awards, with a title "Key Pomeranian Region Cluster" among them.

On the path to fulfilling its strategic objectives, GUT has demonstrated notable success in the outputs and impact of its UBC activities. In numbers, six spin off companies, five science centers, 250 patents, 200 national and international R&D collaborative projects and 700 contracts with entrepreneurs have brought around €15m back to the university.

Besides the quantifiable outcomes, the UBC activities have significantly benefited all the stakeholders involved in the interaction. The industries profit from the academic up-to-date research and expertise, while the university expands the pool of research funding and its implementation opportunities. Moreover, practical orientation of the study programmes and students’ engagement in the science center activities positively influence students’ overall employability rates.

It is important to note that GUT’s promotion of the UBC within and outside the university contributes to the change in the perception of the role of HEIs with external engagement for a more sustainable regional development. With GUT’s transformation into an engaged university, the region has seen a boost in the development of entrepreneurial culture among its younger population, and cohesion and interconnectivity between public and private community stakeholders.

By Alexandra Zinovyeva
On May 6, 1976, a series of devastating earthquakes shook the lands of the Friuli Venezia Giulia region of Italy. To revive the competitiveness of the region following this major setback, the Italian Government invested in innovation: hence AREA Science Park, as a hub designed to translate top quality research into innovative products and services.

From the start, AREA Science Park emerged as a frontrunner in regional science and technology, helping position Friuli Venezia Giulia among the top economies in Italy. Stimulating the growth of local and regional commercial enterprises through well-established knowledge translation mechanisms, connecting like-minded individuals, and producing cutting-edge research, AREA Science Park has gradually evolved into a full-fledged regional innovation ecosystem.

AREA operates under the auspices of the Italian Ministry of Education, University and Research (MIUR). As a public body, AREA receives a grant of €7-8 million from MIUR annually. Yet, its own yearly income from rent, provision of services to companies, and participation in multiple level research projects exceeds its central funding. AREA focuses on the development and management of its own sites, the creation of businesses through incubation and acceleration programmes, innovative high-tech research, the development of services for university-business cooperation (UBC), and entrepreneurship training to support the growth of regional SMEs and start-ups.

AREA is also rich in facilities that can support the operationalization of joint activities. To date, the Park has grown into 90,000 square meters of laboratories, offices, and service areas, stretching across the Trieste hills and overlooking the castle of Gorizia with its three campuses. Eight collaborative research institutes have their facilities at the site, which facilitates interactions with the 80 companies residing in the Park. The main knowledge transfer vehicle Innovation Factory is an in-house company of AREA, which functions as an intermediary organization in the regional and national knowledge transfer system.

Unlike venture capitalists’ interests in promoting only the most commercially ready proposals, Innovation Factory (IF) aims to support equally all new ideas considered worth exploiting and, thus, cultivate the innovation and entrepreneurial spirit of the region. IF assists with the valorization of research results, promotes investment in technology-oriented businesses, supports start-ups in their business development, and creates a platform for partnering and networking.

Innovation Factory has also developed its own methodology to support local entrepreneurship. It matches researchers who have interesting ideas or research results with business development teams that explore the possibility of creating a marketable product or service. Innovation Factory oversees the process of the business idea evolution, its assessment, strategic development toward a market launch, and the establishment of a new company. It then supports new companies for up to three years, or until the start-up reaches relative stability in the market and is ready to be acquired by a serious investor. The figures are impressive: Innovation Factory has evaluated more than 1,600 projects, assessed 281 entrepreneurial ideas, co-created 20 start-up companies, and assisted another 50 in their development.

Over the years of its continuous advancement, AREA Science Park has rightfully earned recognition as a national point of reference for technology transfer and a top-level national research body by the Italian Ministry of University and Research (MIUR). Indeed, while the initial government investment has brought high technology companies to the Park, its independent income earning capability has helped to enhance the commercial capacity of the region, particularly through investment in entrepreneurial activities and promising research outcomes. The AREA complex has also attracted an influx of skilled human capital to the workforce in Friuli Venezia Giulia, and continues to support the knowledge transfer efforts of the local universities.

By Alexandra Zinovyeva and Richard Woolley
Prof. Eric Viardot on His New Book

Revolution of Innovation Management: Internationalization and Business Models

Revolution of Innovation Management: Internationalization and Business Models is a new book that has been released by Springer. The publication is co-edited by Prof. Dr. Eric Viardot, Director of the Global Innovation Management Center at EADA Business School in Barcelona, Spain, and Prof. Dr. Alex Brem who holds the Chair of Technology Management at Friedrich-Alexander-University Erlangen-Nürnberg (FAU).

In this interview, Prof. Dr. Eric Viardot shares insights about his recent publication, which addresses two main drivers of the current revolution of innovation management, including universities and business schools.

Prof. Viardot, please provide our readers with a short overview of your new book.

This new book is the second opus dedicated to the most recent trends in innovation today. The first book titled “Revolution of Innovation Management: The Digital breakthrough”, was analyzing digitalization, one of the three driving forces of the current revolution in Innovation Management. This second book explores in detail how two other major forces – globalization and business model transformation are impacting innovation strategy and management in business, notably in terms of creativity, product development, and process change.

First, the recent acceleration of globalization has significantly contributed to revolutionizing innovation management, from both the demand and the supply perspective. The global middle class has grown from 1.3 billion consumers in 2010 to 2 billion in 2015 and it could reach the 3 billion threshold by 2020. That growth has created a massive appeal for new products and services, especially in Asian and South American countries in addition to Russia and some wealthy countries from the Middle East. This appetite for innovation has been matched by multinational companies which have deployed their Research and Development (R&D) centers all over the world in order to better adapt their offer to the local markets and also to tap the best local expertise in technology and engineering.

But the present revolution of innovation management is also fueled by the surge of groundbreaking business models. Innovating with a different way of doing business has always existed: in their time, companies such as Ikea, Carrefour, Starbucks, and a number of other firms have managed to achieve a sustainable competitive advantage with a groundbreaking business model. However, what was thought of as an exception years ago, now seems to have become a more typical and radical way to innovate, specifically for companies which prefer to break the common practice than just to offer a new product or to apply original processes. The book offers a variety of international
perspectives on these topics with illustrations and analyses coming from Asia, America, and Europe.

**When did you decide to write the second volume of the book, and why?**

Actually, the origin of this second book came at the same time at the first one. Our initial idea was to write a follow up book to a previous one that had been published in 2013, “Evolution of Innovation Management” (Brem and Viardot 2013), which was one of the first books dedicated to analyzing the essential trends in the management of innovation.

We observed that in about three years most of the underlying trends that we had identified had become mainstream and common practice. Open innovation, collaborative processes, platforms, innovation ecosystems are known well known and documented. In the same time, it was clear that the pace and the scope of innovation had increased so dramatically: we then decided to have a more integrated perspective about innovation management by having a wider look to the revolution which is currently taking place. Like with any revolutions, some heads are falling off while new leaders are emerging.

We quickly figured out that by broadening our perspective, we had more interesting material. More specifically, it became very clear that while digitalization is at the heart of the disruption of many industries, it is not the only reason as to why we are currently living an acceleration of innovation in business and society. Thus, we decided to spread our material and analysis over two volumes, and not only one book.

**What are the key messages in your book and how do they relate to higher education?**

The key message is that innovation today is an integrative process which is the result of three different forces, which often combine themselves to have a bigger effect. Higher Education is a good illustration. The current revolution in Universities and business school is to develop online programs, such as the online MBA. It is telling that the Financial Times now offers a ranking of the 20 top online MBA programs. It reflects the growing importance- and acceptance- in the market with the demand for this kind of program. An online MBA, it is a combination of digital, global, and business model innovation. Many of the face to face classes are now substituted to online classes, which makes it easier for students from across the world to access this kind of program. Although, online MBAs are also changing the business model of schools and universities. First, I can here testify as I am teaching in this kind of program, the teaching skills are very different from the ones required in a traditional class. For instance, the interactions with the students are very different: they are not based on the physical contact but on the virtual interactions and this modifies the dynamic of a class, the same way that a conversation on WhatsApp is different than having a conversation face to face. The length of online MBA programs and their scheduling is also different than physical programs, etc.

Thus, the conclusion of our book applies very well with the education sector. We argue that the three forces of the innovation revolution- digitalization, globalization, and BM transformation, are impacting the three main activities of the innovation process, namely obtaining, integrating, and commercializing ideas: we provide a framework not only to analyze but also to identify the future challenges of innovation along those 9 characteristics. I believe it can be very effective if used by managers and directors of universities and business schools all over the world.

**In your opinion, what are the recent trends and challenges in the area of innovation management?**

If you have asked me that question six months ago, my answer would have probably been different, as I am convinced that the future of high education along with business and societies lies in the development of a more integrated and globalization world. However, some recent political and economic events could actually lead to a fragmentation of the world. A recent example is the decision by the US government to raise US import tariffs on steel and aluminum which could generate retaliation from other countries and ultimately would diminish the globalization of exchanges and ideas. Those actions are strengthened with the results of the recent political elections in the US and in Europe where nationalist- and anti-globalization- opinions and support are gaining traction and pushing for more isolationism, as in the early years of the XX century. Even the future of technology could recede to the past; for example, the strong control of the Chinese government on the access to Internet or the suspicion that Russian hackers may manipulate data and opinions on social networks are already having a toll on the diffusion of digital technologies and a wider acceptance and use.

Since the beginning of the XXI century, and especially since the last decade, we have been living an amazing transformation of our world. My opinion is that we are still at the beginning of many other dramatic changes, including in the high education sector, but we should not take the current trends as granted and automatic. Progress in society is not always linear and is often constrained by more conservative forces before finally blossoming.

Interviewed by Nino Japarashvili
In this issue our selection of the most recent publications focuses on innovation trends and performance, best practices of sustainable campus practices, and the rising importance of the chief innovation officers at universities.
THE OECD OBSERVATORY OF PUBLIC SECTOR INNOVATION (OPSI)
2018 | OPSI

The report serves as a forum to share lessons and insights on government innovation. To further its mission and learn from leading-edge innovators, OPSI has partnered with the Mohammed Bin Rashid Centre for Government Innovation (MBRCGI), which serves to stimulate and enrich the culture of innovation within government.

SCIENCE, RESEARCH AND INNOVATION PERFORMANCE OF THE EU
2018 | EUROPEAN COMMISSION

The ‘Science, research and innovation performance of the EU, 2018’ (SRIP) analyses Europe’s performance dynamics in science, research and innovation and its drivers, in a global context. The report combines a thorough indicator based macroeconomic analysis with deep analytical research dives into hot policy topics.

EUROPE IS BACK: ACCELERATING BREAKTHROUGH INNOVATION
2018 | EUROPEAN COMMISSION

In this report we present a set of recommendations and related actions for a European flagship initiative – the European Innovation Council (EIC) – as the central pillar of EU support for breakthrough innovation. It should provide a critical mass of funding and expertise for high risk / high gain breakthrough innovation, which is simple, empowers the innovator and incentivises private investment.

THE RISE OF THE CHIEF INNOVATION OFFICER IN HIGHER EDUCATION
2018 | ENTANGLED SOLUTIONS

Colleges and universities are increasingly reflecting the trend by creating formal innovation roles—under the provost’s office, within information technology departments, or as free-standing C-suite positions. More than 200 institutions now have senior roles with words such as “innovation” or “digital” in their title, and another 200 schools have online learning roles that are often connected to broader academic innovation efforts, according to our research.

SUSTAINABLE DEVELOPMENT: EDUCATING WITH PURPOSE
2018 | ISCN & GULF

The report highlights 42 sustainable campus best practices from ISCN and Gulf universities. Cases are highlighted in chapters on living lab approach, equality and wellbeing for all, sustainability on campus, and education as a catalyst.
TO VISIT:

Upcoming Events

Knowledge sharing, building new relationships and discovering solutions are the core elements of our events. Join the largest conference in this field, or attend one of our professional development workshops.
ENTREPRENEURIAL UNIVERSITIES WORKSHOP
17-18 MAY 2018

How entrepreneurial is your university? Without the leaders who can navigate the transformation with their inspiration and expertise, the universities cannot keep up with the pace of modern innovation and regional development. Join our two-day workshop, held in Amsterdam on May 17-18, 2018, to explore “entrepreneurial university” from different perspectives. Join us at www.edu.uiin.org

UNIVERSITY-INDUSTRY INTERACTION CONFERENCE
20-22 JUNE 2018

Join more than 500 university leaders, practitioners, CEOs and academics to explore the state-of-play of university-industry interaction around the globe. During three days you will be exposed to more than 100 presentations and sharing knowledge and establishing new connections with 250+ organisations. Find out more www.university-industry.com and join us in London on June 20 - 22, 2018.

ENTREPRENEURIAL LEADERSHIP IN HIGHER EDUCATION
19-20 SEPTEMBER 2018

At this workshop, you will understand what is particular about modern leadership in higher education, not just the general characteristics of good leadership. We will examine the effect of leadership on core activities such as teaching, research and administration. We will investigate how to lead an entrepreneurial organisation and how to develop entrepreneurial cultures. Overall, the emphasis will be on finding practical applications that can help you make a difference in your own organisation.

UNIVERSITY-INDUSTRY ENGAGEMENT CONFERENCE
11-13 FEBRUARY 2019

Get exposed to the Asia-Pacific University-Industry Engagement community at UIIN’s second Asia-Pacific conference in Sydney, Australia. In collaboration with UTS, UIIN will organize an event bringing together more than 200 university managers, researchers, policymakers and innovation and entrepreneurship managers from all across the globe. Join us in Sydney on February 11 - 13, 2019.
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