

**34th IASP Annual World Conference
Istanbul, Turkey**

The importance of an integrated approach: from balancing between real estate, concept, and management to the value of innovation programmes

*Parallel Session 1
"Future-proofing our space"*

Author:
Paul Jansen (pj.caudata@gmail.com)
Caudata, The Netherlands

Co-author(s)
Chiel van Dijen
Kadans Science Partner
Tom Minderhoud, UNStudio
Laurens Tait, Arup

HOSTED BY



ODTÜ-TEKNOKENT

**ITUARI
TEKNOKENT**

BRIGHTER
TOGETHER

The importance of an integrated approach; from balancing between real estate, concept, and management to the value of innovation programmes

Executive summary

Years of experience in the development of science & technology parks and industrial innovation campuses all over the world taught us the importance of a comprehensive approach, but more importantly the relevance of innovation programmes linked to modern innovation areas. These 'soft' innovation programmes mostly focus on the joint development of knowledge, new business cases and connecting talent from diverse backgrounds.

Case studies from the Netherlands teach us that these innovation programmes are already a basic precondition to a successful innovation area. The content of the programmes (knowledge exchange, financial vouchers to support business cases, connecting talent, business development support, etc.) are important but the main theme and distinguishing brand factor becomes the defining aspect. The key take away is that these programmes are crucial to establish a 'soul' and specific 'flavour' to the park, campus and its community.

Economic relevance

Knowledge and innovation are essential elements for the economies of most countries. With a successful innovation policy, one cannot ignore the physical environment that businesses (both large and small) require in order to successfully execute their work and ideas and generate/share knowledge, all focused on creating innovative products and services. These companies often require special buildings that may require large investments. Buildings may include offices as well as laboratories, clean rooms, small-scale (test) production units, and so on. These sites may thrive in many places, but economic researchers assume that a concentration of such buildings (and thus innovative companies) results in added value for all companies involved. Although research into these assumptions shows quite variable results, this assumed added value has resulted in a clustering of companies in numerous science parks. While numbers are difficult to provide, one indicator may be the number of members of the International Association of Science Parks & Areas of Innovation currently approximately 400.

Development in 'science parks'

The development of science parks, innovation districts and areas is far more complex than developing a regular business park or work location. Given the target audience and the specific requirements laid down by the involved entrepreneurs and institutions with regards to the built environment, the surroundings and facilities, the development of a science park requires a well-considered integral plan on the urban level, but also clear ideas about the management of the park, funding, programme guidelines for buildings, real estate financing, innovation programmes and so on.

Striking a balance between the hard elements (infrastructure, real estate, other facilities) and the softer elements, like governance, management and innovation programmes is crucial for a successful innovation areaⁱ. The commonly agreed preconception is that a comprehensive approach is essential for an area to be successfully developed, but the complex nature of an innovation area, makes it increasingly important to work in an integrated team. Numerous disciplines play a role, but the triad of market research through spatial concept into an urban master plan is crucial. The Innovation Area Development Partnership (IADP) is a recently founded Dutch initiative that provides an iterative cross-fertilisation approach, world class knowledge and unique services.

Due to the particular nature of innovation areas, establishing such areas and monitoring their quality is not easy. For this purpose, the Innovation Area Development Partnership has developed a conceptual model that provides a first concise checklist to assess whether all ingredients are present in the development of an innovation area. If issues are missing, it should be immediately clear that (additional) attention must be paid to these specific aspects. But above all, using this model, the correlation between various programmes, actors, management, real estate, infrastructure becomes clear. By applying this model in various developments around the world, the IADP is currently validating the proceeds of this model in concrete projects.

In our opinion the link between market (potential) and the urban master plan (product) is essential. By applying market research, the target group, the functional concept, the financial viability and the functional programme of requirements will be clarified. The market research however, has a broader goal than only providing insight into market potential, it also describes the long term strategic development trajectory.

In the development of innovation areas, the redevelopment of existing sites and the creation of innovation districts a modern 'master' should be followed nowadays. This means that the parks and/or innovation areas are embedded in the regional economy, are part of broad-based innovation programmes and are managed by an integral management philosophy. The aim is to design this in an attractive organisation with modern real estate and inviting surroundings, that optimally facilitate this new way of working and co-creation and innovation. The activities within innovation networks now transcend a single innovation area, often having a regional, national or even international focus. Furthermore, another characteristic is that they are usually the result of a unique combination of public and private ownership.

The potential of this new generation of science parks, co-creation and innovation parks and innovation districts to act as a motor (substantial driver) for the regional economy, is now generally accepted. However, limited research has been done on the success factors for a comprehensive development (hard and soft elements) of these sites and areas. Still we see developments driven by real estate demands on the one side or autonomous regional innovation programmes on the other. The most important factor is to know how to connect both sides of the spectrum in order to contribute substantially to the regional economy in the long term.

Before we present some thoughts on this topic from a Dutch perspective we would like to show the development in time from science parks, industrial innovation campus to innovation districts, including their management and the offered services. To our opinion there are currently three main types of innovation areas.

Science Parks

When talking about the clustering of innovative companies the science park is the oldest concept in relative terms. Since the rise of science parks in the early fifties, quite a few definitions have been introduced. For example, the IASP places strong emphasis on the science park as an organisation of professionals committed to exchanging information flows between companies and research institutions, promoting innovation in companies and assisting starters and spin-off businesses. However, Hansson (2004) focuses more on appearance and, on the basis of a number of definitions, concludes that science parks almost always have a university in close physical proximity, focus on knowledge and high tech companies and include a special organization that helps starters. We support the definition of the IASP. We believe science parks are primarily about stimulating innovation through well-functioning networks. Property and area development are crucial, but are nevertheless of secondary importance.

The development of science parks is a relatively recent phenomenon: of all European science parks, only 4% were established before 1980. 27% were established in the 1980s and the rest thereafter (EC, 2014). Science parks are primarily an urban or, even more so, a metropolitan phenomenon. Judging from the membership of the IASP, only 6% of parks are located outside of cities and 40% can be found in cities with well over a million inhabitants.

Two-thirds of the science parks in Europe are situated on university grounds and 17% are located no less than 5 km away from such institutions. Earlier IASP research has shown that worldwide, approx. 40% of all science parks have an on-site university or one located in their immediate vicinity. The absence of a clear link with a university may result in a relatively ineffective park (Ratinho et al., 2007). But inefficiency may also occur if the concept is not taken seriously and companies only establish themselves in such parks for their public image and appearance. Moreover, the relationship with the university is not necessarily or solely based on intense knowledge sharing between the research institute and companies based in the park. The availability of various facilities and a pool of students (interns) and graduates play a significant role and are sometimes even more important than the actual sharing of knowledge (Van Dinteren and Pfaff, 2011; EC, 2014). It should not necessarily come as a surprise that companies don't solely focus on adjacent universities for knowledge sharing and co-innovation. When talking about crucial knowledge or information, these transcend the decision to establish oneself in a certain region (Weterings and Ponds, 2007). Nevertheless, it is these relationships between companies and knowledge institutions that distinguish science parks from regular business or office parks. Science park management teams (the fact that there are separate management teams is another factor that makes these parks unique) are often committed to these relationships and try to promote cooperation between individual companies and companies and universities. This allows for the creation of an informal network ('local buzz'), resulting in substantial positive effects when creating innovation networks between local actors (Capello and

Morrison, 2005). At the same time, one could write an entire book about the differences of opinion on this aspect.

Although the stimulation of networks, cooperation and knowledge sharing are essential to well-functioning area management, attention is equally paid to the creation of a community. One could consider the networks as communities, but when talking about communities, these are often less 'strict'. Communities involve informal contact between employees, meeting each other at seminars, organizing sports events, concerts, and so on. By applying these principles in a well-designed environment creativity is promoted.

The Industrial Co-Innovation Park

Earlier parts of this paper have focused on the relationship between science parks and universities. At the same time, a science park may also develop itself around a different major research institution. For example, even a company may act as the pivot. In the latter case, it is better to speak of an '(industrial) co-innovation park'. Where the crystallization point in a science park is the university, in a co-innovation park this is a leading industrial company. Examples include the DSM Industrial & Biotech Campus (DSM, Delft, Netherlands), Kodak's Eastman Business Park (Rochester, USA), the AUDI Ingolstadt site (Germany), the Luxembourg Automotive Campus (established around Goodyear's Luxembourg Innovation Center and IEE s.a. sensing solutions) and Chemelot Campus (DSM, Sittard/Geleen, Netherlands).

Such developments are the result of company strategies, focused on co-innovation: the cooperation with other companies and institutions to develop innovative, creative solutions and products. Nowadays it has become harder for companies to keep up with changing technology, economy and markets by innovating solely by themselves. Technology in particular has become so specialised that nobody can afford to do everything at the highest level on their own. Cooperation with other companies, institutions and universities is required. To succeed, businesses must overcome their deep-seated fear of knowledge sharing. Fortunately, in many cases they were able to do so: these days, it has become popular to view cooperation with strategic partners as essential in the development of technological innovations.

Continuous innovations across organizational boundaries may lead a company to the idea of establishing an industrial co-innovation park on its site (or adjacent to it). Precondition is that the company must understand the dynamics of inter-organisational networks and develops - or has already developed - skills in managing networks and facilitating network processes.

The practical possibilities for establishing a co-innovation park, in terms of available space, are often attributable to the downsizing of activities or excessive hectares of expansion reserve. Downsizing may partly occur by offshoring activities, but may also be related to changing production conditions. For example, these days the manufacturing of semiconductors requires less and less space. So, setting up an industrial co-innovation park can be attractive if the leading company:

strongly advocates the idea of innovation and wants to innovate in close cooperation with its suppliers (open innovation or co-innovation); is established in a region that has the characteristics

that stimulate innovation, the space required by other companies and is able to take care of the qualities that are asked for to make such a park a success.

This does not mean that co-innovation always requires physical proximity of the firms and institutions involved, but being located in the same park makes it easier to communicate. Moreover, companies situated on such integrated industrial areas may share the material supplies, utilities and services focusing on - for example - safety, quality, personnel and the environment.

Innovation Districts

A relatively new phenomenon in the field of innovation is the innovation district. In an innovation district, the cooperation between companies and institutions is still essential, but the concept differs in specific ways from the two aforementioned districts. First of all, these districts are often located inside urban areas, whereas most science parks are located on the outskirts of cities, in suburban locations. Moreover, innovation districts are often not newly developed, but are formed after a restructuring of an existing situation. As a result, an innovation district often has a mixture of purposes, including housing. In organisational terms, this often means a shift from the triple helix to the quadruple helix. And whereas science parks often place a strong emphasis on technical disciplines, an innovation district often takes a broader approach and thus offers room for a wide variety of creative industries and consulting firms. The link with a university may be less strong, but may partly be replaced with auxiliary branches. In addition, specialisation is sometimes not a key aspect of these districts. For example, 22@Barcelona focuses on four different clusters: Media, Information and Communication Technologies (ICT), Medical Technologies (MedTech), Energy and Design.

Similar to other districts, innovation districts have the requirements of good, dedicated management that encourages the creation of a community and networking between established companies and institutions. And compared to industrial campuses, there is often a leading company or institution (hospital, university, research institute).

Sanz (2016) describes an innovation district⁶⁷ as follows: “a designated zone with its own specific management team, whose main objectives include economic development via the promotion and attraction of selective innovative business for which specific services are provided or made available, and that may also include residential and cultural zones or facilities, or be embedded in urban spaces having such facilities, and with which the economic aspects of the area of innovation interact”.

Science parks, innovation districts and industrial innovative campuses are different concepts, especially in terms of target groups and physical form. At the same time, they show strong similarities in terms of work environment and management. Proper management - both in physical and functional terms - is a prerequisite for all three. Looking at the three districts together, they are all part of the overarching concept on an 'innovation area'

⁶⁷ Factually speaking, Sanz refers to an Innovation Area. We prefer to reserve this term for the different concepts combined. According to Sanz' definition, an innovation area can be both considered at a sub-local and regional level. When it comes to the regional level, we prefer to use the term innovative region.

From physical environment to work environment

Whereas during the early days of science parks the focus was often on physical development, over the years people have started to realise that science parks require a completely different approach. About two decades ago, the adage 'brains, not bricks' was introduced. This broke with a science park as mere property development. At the same time, this doesn't mean that the physical environment isn't vitally important in stimulating the process of creativity, interaction and innovation (Van Dinteren & Keeris, 2014). The importance of this is even increasing now that people are realising that an attractive (physical) environment contributes to creativity and competitiveness. Here we could make a distinction between facilities for employees and facilities for companies.

The *sharing of facilities for companies*, which people hope will lead to knowledge sharing and synergy, is a major reason why companies establish themselves on a campus or science park. This aspect is more important than the actual possibilities of cooperating with the university itself, as shown by a survey among entrepreneurs established at Dutch science parks or campuses. Besides the presence of a young student population, the availability of information systems, laboratories and clean rooms is also important (Van Dinteren & Pfaff, 2011).

On the other hand, when *talking about facilities for employees* (including ambiance created by buildings, design and landscaping), management has the following reason for their existence: if employees enjoy their work, they simply work more effectively. If they work more effectively, this subsequently has a positive effect on productivity and creativity. Ultimately this leads to better outcomes for businesses. Over two thirds of entrepreneurs at Dutch science parks (completely) agree with the statement that, "given the increasingly tight labour market for highly educated people, it is essential that a science park offers an optimal working environment" (Van Dinteren & Pfaff, 2011). This involves extensive amenities (e.g. shops, hairdressers, restaurants, fitness centres) and an attractively landscaped park with recreational facilities (walking and running routes, meeting places, and so on). A concept such as 'Enjoy Work' therefore doesn't primarily focus on the target group, but on creating a comfortable working environment (see www.enjoy-work.com; Van Dinteren, 2007).

Dutch case - Leiden Bio Science Park – Astellas' Mirai House'

In the Netherlands, the design of the Astellas 'Mirai House' is a great example of a shift in emphasis from the physical environment to the work environment. IADP-partner UNStudio was involved in designing the Research and Development Headquarter for the international pharmaceutical firm Astellas on a prominent location within the bio science park. The European headquarters of Astellas in Leiden, Mirai house, aims to benefit from the knowledge available locally. In this way Astellas aspires to offer excellent treatment options for doctors and patients and to ensure that the medicines developed follow the regulations applicable in the individual countries of the EU.

During the development of medical treatments, Astellas mobilizes external resources and proactively involves partners at every step of the R&D process. In the early discovery phases Astellas collaborates both with acclaimed academic institutions and with public and private organizations to complement the available own

knowledge. Essential for this co-creation is the organization of the science park and the location of the headquarters within the innovation park. The building is seamlessly and physically embedded in the park by providing clear sightlines and creating a pleasant, open and transparent working environment for Astellas employees, in addition to an agreeable and welcoming gesture to their international visitors.

UNStudio proposed a development that put an emphasis on an innovative mix of functional use and that offers architectural quality and new urban interaction. In the public space surrounding the building an emphasis is set on the human scale and on pedestrian and bicycle movement to encourage human interaction and facilitate social connections.

The organisation and materialisation of the building ensures clear views towards each of the three functional areas within the main framed volume surrounding a courtyard: offices, laboratories and entrance hall. The floor plans in the interior are flexible and based on the campus concept, where emphasis is placed on communication.

In line with the DNA of the park the building volume of the Mirai House aims to integrate the research and laboratories in an organic way with the more organizational additional requirements of a large company such as offices and ancillary functions. By streamlining these operational aspects Astellas strives to connect with other partners in the R&D process and to stay at the forefront of innovative scientific discoveries. In the Leiden Bio Science Park there are around 106 tenants linked to bio sciences institutions and medical companies employing a total of around 18.000 professionals in a range of companies from start-ups to well established multi-nationals. Together they form a symbiotic work sphere supporting research, education, networking facilities and business partnerships.

Innovation programmes and their relevance to the work environment

The Organisation for Economic Co-operation and Development (OECD) definition of innovation is “production or adoption, assimilation, and exploitation of a value-added novelty in economic and social spheres; renewal and enlargement of products, services, and markets; development of new methods of production; and establishment of new management systems. It is both a process and an outcome”. A 2013 survey of literature on innovation found over 40 definitions. Definitions of innovation programmes are even more diverse. Within the IADP we talk about innovation programmes as a cluster of activities aiming at establishing innovation (see above). Activities are most often about:

- Knowledge exchange;
- Support new business cases (by financial vouchers);
- Connecting talent from diverse backgrounds;
- General business development support
- network activities.

Dutch cases – innovation programmes – work environment relevance

In general, Dutch innovation programmes are not always linked to a specific science park or industrial innovation campus. Sometimes there is not even an urban link and the focus of these programmes is purely at the regional economy, like the Dutch Rijk van Nijmegen 2025 innovation programme for instance.

What we learn from other Dutch innovation programmes is that these really add to the work environment by their community and business stimulating role. Sometimes these programmes even play a crucial role in establishing 'physical' knowledge intensive real estate by offering subsidized 'start-rents' and by doing so offering an interesting business case for real estate investors.

- Novio Tech Campus Nijmegen

Novio Tech campus in city of Nijmegen offers 10,000 m² of state-of-the-art research infrastructure and accommodation for entrepreneurs and researchers in the Life Sciences, Health and HighTech sectors. In close corporation with its partners Kadans Science Partner and SMB Life Sciences, Novio Tech Campus offers entrepreneurs access to the expertise, facilities and (inter-)national networks of companies and knowledge institutions. They also provide start-ups and young companies an integrated package of facilities and support for their enterprise.

In particular SMB played a crucial role in the establishment of the campus. Without this support programme the initial business case of the first building of the campus would have been much more difficult. Later on, the role of the programme changed and is incorporated in the new Business Generation Health & Technology programme. Recently the Business Generation Health & Technology (BGHH) has been established as implementation programme with the aim to increase employment by innovative entrepreneurship particularly in the (top) sectors life sciences & health (LSH), high tech systems & materials (HTSM) and chemistry to stimulate and support. There are three core activities defined focused on assisting innovative enterprises (start-ups, scale-ups and grown-ups). With three work programmes:

- an incubation work programme for (very new) start-ups
- an acceleration of work programme for scale-ups
- an activation work programme for established SMEs (grown-ups)

In addition, there are the following support activities.

- Marketing & communication to put the ecosystem on the map
- Scouting and screening of new business opportunities
- Knowledge sharing events for entrepreneurs and partners

Although the Novio Tech SMB support programme was crucial to the initial business case of the campus, its role has changed and is nowadays important for the 'soul' of the campus, at least according to the CEO of Novio Tech Campus.

- Brightlands Chemelot Campus Geleen

Brightlands Chemelot campus in Geleen is home to a vibrant and fast-growing open community of ground-breaking and world-leading companies and knowledge institutes. Facilities include the latest R&D and manufacturing infrastructures. The Brightlands Innovation Factory is the entrepreneurial backbone of the Brightlands ecosystem states that world-class industry knowledge and expertise are coupled with expert supported programmes, value-added services and facilities, and access to funding. The business development team at Brightlands Chemelot Campus is the partner for growth on campus. The team helps to shape new businesses by combining IP positions, facilities, networks and venture capital, and more, all of which strengthen the clusters within the campus's prime scientific sectors and provide services in the campus's Service Boulevard.

Brightlands Chemelot Campus is home to the Maastricht Science Programme and Chemelot Innovation and Learning Labs (CHILL). This institution offers chemistry courses for students and professionals. Building and nurturing a community of this kind takes effort. Brightlands Chemelot Campus believes in the efficacy of community-building initiatives, such as seminars, network meetings, TEDx events, sports, and vitality programmes such as BtheMove, and a range of effective campus communication channels. These 'soft activities' are valued of more importance to the work environment than the actual physical real estate and shared facilities.

- DSM Campus Delft

At this campus, various successful public-private R&D programmes are running and available to the companies, universities and other stake holders. The Yes!Delft Incubator, for instance, offers facilities and services in a high-tech centre, including office space, meeting facilities, technical workspaces, coaching services and regular networking events. Europe's largest public-private innovation partnership was created in 2010 by the European Institute of Innovation and Technology. Climate KIC brings together 162 partners to educate and develop innovation to solve challenges caused by climate change. DSM, TU Delft and Deltares are all part of the Dutch Climate-KIC centre and by doing so offering a unique work environment in Delft.

- Pivot Life Science Park Oss

In another Dutch example the regional innovation programme the "Power of New Business Oss" offers companies at the Pivot Life Science Park in Oss financial vouchers in order to test new business cases. Specific, and expensive, early drug recovery tests are supported by this regional innovation programme. This is an example of a very tailored support from a more abstract programme, but also at Pivot Life Science Park Oss the general attitude towards the activities of the innovation programme is that it offers a unique flavour to the campus community and its work environment. By talking to the entrepreneurs, it became obvious that the actual business stimulating activities are valued, but its community engagement activities even more.

It is also seen in Oss that the brand that the programme adds to the campus management package strengthens the actual content.

In conclusion

It can be concluded that a balanced development of modern innovation areas is an important precondition for success in the short and long term. In this paper, we have focused on the value of soft factors to the work environment, in particular Dutch innovation programmes, and the need for a comprehensive approach.

Years of involvement of the partners of the IADP in the (re) development of several Dutch science parks and industrial innovation campuses learns that in the Dutch practice this principle is widely accepted but not always valued correctly. In some cases, there is still either a sharp focus on the real estate development and operation or on regional innovation programmes. Management of an integrated business case is a rarity, although some examples described in this paper show otherwise. The ownership situation in Dutch science parks usually doesn't help either. Often a separate real estate company focuses on a balanced real estate exploitation, with limited attention for the structuring and management of innovation networks. Even if the importance of these networks and communities is recognized as vital to a regional economy.

Physical hardware (real estate, infrastructure), such as incubator centres, laboratories and meeting places are of course important, but only in a facilitating sense. Based on an analysis of several Dutch science parks (true innovation areas do not exist yet in the Netherlands) and innovation programmes learning points can be derived with regards to the comprehensive approach, the management, ownership, and content of innovation programmes. It can be stated that although an innovation programme is an important pre-condition in establishing a science park, it is not a unique selling point anymore. In one way or the other these programmes are part of the management package of almost all science park or campus in the Netherlands.

Key take away is that science parks and industrial innovation areas develop into modern innovation areas, including their management and the offered services. Innovation programmes have become an important element of the offered service package and sometimes play a crucial role in the initial business case of the real estate. The programmes (and its activities) are very valuable to the work environment, but are so common that there not considered as a unique selling point. Most important is that these programmes create a 'soul' and specific 'flavour' to the park, campus and its community. At least, that is what the analysis of various Dutch cases teaches us.

Bibliography

- Capello Roberta and Andrea Morrison (2005), An evaluation of the effectiveness of science parks in local knowledge creation: a territorial perspective. Paper for the 5th Triple Helix Conference. Turin.
- Dinteren, Jacques van (2007), Enjoy work! Als leidend principe. Een nieuw type werklocatie. In: Real Estate Magazine (50), pp. 24-29.
- Dinteren, Jacques van, Debbie Pfaff (2011), Science park: innovatie of imago? In: Real Estate Magazine, no. 32, pp. 32 – 37.
- Dinteren, Jacques van, Willem Keeris (2014), Innovatie vraagt om investeren in R&D-vastgoed. In: Real Estate Research Quarterly, april, pp. 26 – 34.
- EC (2014), Setting up, managing and evaluating EU science and technology parks. European Commission.
- Hansson, Finn (2004), Science parks as knowledge organisations. The 'ba' in action? MPP working paper no. 15. Copenhagen Business School. Copenhagen.
- Ratinho, Tiago, Elsa Henriques and Luís Maltes (2007). Science parks and business incubators: the Portuguese case. Paper for the European Investment Bank.
- Sanz, L. (2016), Understanding Areas of Innovation. In Anna Nilina, Josep Pique, Luis Sanz (red.): Areas of innovation in a global world. IASP (e-book).
- Weterings, Anet, and Roderik Ponds (2007), Regionale kennisnetwerken en innovatie. Rotterdam: NAI Uitgevers publishers.