Managing a Science Park: A study of value creation for their tenants

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1. Introduction

Over the past decade we have witnessed a huge amount of support activities aiming to promote start-up and growth of various types of firms, such as entrepreneurship training (Henry et al., 2003), financial schemes (Norrman and Klofsten, 2008) and infrastructure arrangements (Storey and Tether, 1998). Within this last category, Science Parks play an important role, considering their diffusion and the amount of money invested by national and local governments (Link and Scott, 2007).

Despite their increasing number, currently estimated in 1200 to 1500 throughout the world (Wainova, 2009), it is still debated the effectiveness of Science Parks as support tools for technology-based firms creation and growth. Nevertheless we believe that instead of answering the question whether this tool is effective or not, the question to answer is when, under which conditions Science Parks can deliver an effective support to their firms and reach their goals.

An important matter, when assessing the impacts of these supporting schemes, is whether these activities are appropriate and reflect the real needs of the entrepreneurs and their businesses (Klofsten and Jones-Evans, 1996). Our study takes this statement into consideration. Through a comprehensive case study we take a closer look at how Science Parks operate and how they work with their tenants, possible future tenants, and the surrounding environment.

The aim of this paper is to investigate any possible gaps that may exist between the supply and the demand for business support within Science Parks from a supply-side perspective (involving the main stakeholders from the supply-side such as Science Park's management, incubator's management, universities liaison officers, politics, etc.). We are also interested in how this potential gap could be bridged through more effective delivery of business support both in terms of "configuration" and "process" oriented support (Autio and Klofsten, 1998).

2. State of the art

According to the definition given by the International Association of Science Parks (IASP), a Science Park "stimulates and manages the flow of knowledge and technology amongst universities, R&D institutions, companies and markets; it facilitates the creation and growth of innovation-based companies through incubation and spin-off processes; and provides other value-added services together with high quality space and facilities" (IASP, 2002).

Over the years there have been numerous studies (Phan et al., 2005) analyzing business support activities within Science Parks. The majority of these studies have focused on the demand-side of a Science Park: its tenants and their entrepreneurs, trying to assess the impacts that Science Parks have on their firms and how entrepreneurs perceive the actual business support.

The most frequent aim of these studies has been to understand the importance of these organisations for the tenant firms in terms of growth of sales, profitability and employment (Lee and Yang, 2000; Löfsten and Lindelöf, 2002; Colombo and Delmastro, 2002; Chen and Huang, 2004), outputs of R&D activities (Lindelöf and Löfsten, 2003; Link and Scott, 2003; Siegel et al., 2003; Squicciarini, 2008; Yang et al., 2009) and capacity for establishing formal and informal links with Higher Education Institutions (HEIs) (Quintas et al., 1992; Vedovello, 1997; Phillimore, 1999; Link and Scott, 2003; Fukugawa, 2006; Malairaja and Zawdie, 2008). These studies have drawn often contrasting conclusions.

On the one hand, some authors believe that Science Parks have generally failed to foster the establishment and growth of new technology-based firms or to encourage technology transfer among firms and public research organisations. According to other authors Science Parks create added value to the on-park firms and positive externalities to the territory in which the Park is located. The added value is measured for instance by the increased growth rate in turnovers and number of employees, greater resource diversification, lower mortality rates, and better innovative performance, in terms of R&D expenditure and intensity, number of patent applications, number of copyrights and publications, number of new products/services launched, etc.

To our knowledge however very few studies have dealt with potential barriers that might exist at the supply side (concerning the Science Park) of delivering business support services and their perception of tenant's potential ability to absorb what is offered through such activities. In this study, we address how Science Park organizations approach their tenants, how they create value for them and the Science Park mangers' opinions on what should be done to overcome any possible mismatch between the demand and the supply of business support.

3. Methodology

We perform a case study in Östergötland County in East Sweden, a 3.856 square miles area, approximately 200 kilometers south of Stockholm. Two Science Parks operate in the Östergötland County: the Mjärdevi Science Park (MSP) at Linköping, founded in 1984 and the Norrköping Science Park (NOSP), at Norrköping started in 1999.

The Östergötland region is well known for successful collaboration between business, governments and academic actors (Klofsten et al., 1999; Etzkowitz and Klofsten, 2005). In this region Mjärdevi Science Park (MSP), Norrköping Science Park (NOSP), the Linköping University (LiU) and the local governments set up an effective triple helix configuration to create the necessary conditions for the achievement of Science Park's goals.

The Östergötland innovation system has been the object of many studies (e.g. Hommen et al., 2006; Etzkowitz and Klosten, 2005; Klofsten et al., 1999; Jones-Evans and Klofsten, 1997).

Several sources have been used for performing the case study. Firstly, scientific literature on the Östergötland County's triple helix actors has been studied. Secondly, institutional documentation (web pages, press conferences, articles in newspapers) has been analyzed. Thirdly, in-depth semi-structured interviews have been personally conducted with people holding key-positions at each relevant stakeholder on the supply-side: CEOs of MSP and NOSP, CEO of the LEAD business incubator, chief of the Innovation Office at Linköping University, chief of the Center for Innovation and Entrepreneurship at LiU, head of the Department for Trade and Industry at the Norrköping Municipality, the director of Entrepreneurship & Employability at Östsam Regional Development Council, two politicians at the Linköping and Norrköping Municipality and one at Östergötland county have been interviewed. A total of nine in-depth interviews have been carried out, approximately two hours each in length.

Interviewees had been asked to explain the function of their organization within the regional innovation system and which formal and informal links their organization has with the Science Parks. Science Parks managers had also been asked to identify possible gaps that entrepreneurs and firms could suffer and how they bridged or plan to bridge these gaps.

In some cases there has also been further e-mail communications and a second meeting with the interviewees. Finally, field visits have been conducted with all the stakeholders visited at least once during the period November 2010–February 2011.

4. Findings and interpretations

Interviews with managers are aimed at understanding how they work with their customers and how their support could be more effective. In particular supply-side managers had been asked to identify possible problems and gaps that their customer could experience. Although gaps identification cannot obviously be discerned from the double perspective supply/demand-side, it is the supply-side that set up the initiatives aimed at bridging these possible gaps.

The first finding of our study is that supply-side managers are aware about the potential existence of misalignments between what the Science Park offers and tenants' real needs. These misalignments, or gaps, could result in an ineffective support delivery and have a negative repercussion on Science Park's mission and on tenants' performance. Gaps can even be perceived as strong enough to advice prospective tenants against the on-park location.

Gaps identified by our study are detailed in the next paragraph.

4.1. "Configuration" and "process" gaps

Gaps are classified in line with Autio and Klofsten (1998) in terms of "configuration" orientation - (e.g. insufficient resources and inappropriate infrastructure) and "process" orientation (e.g. negative attitude towards learning, cultural barriers of networking and misunderstanding concerning type of support provided).

Our study, based on interviews with supply-side managers' view, identifies several gaps. Those who they believe are the most important in terms of effectiveness of the support provided to SMEs by the Science Park are shown in Table 1.

Table 1 – Configuration and process gaps

I. *Configuration Gaps*	II. *Process Gaps*
1. Inappropriate infrastructures	1. Cultural barrier to networking
2. Types of facilities not allowed	2. Aptitude about learning
3. Excessive distance from universities and research centers	3. Too theoretical support
4. Unavailability of venture capital	4. Pedagogical issues
5. Lack of business expertise	5. Lack of information
6. Budget restrictions	6. Non-customized support
	7. Time to attend
	8. Lack of interest/motivation

Configuration gaps are those related with the static design of the Science Park. These kinds of gaps are normally generated and overcome during the planning stages of the Science Park and include:

- Inappropriate infrastructures, in term of flexibility, availability of spaces and facilities. Firms could need flexible spaces which would not represent a restriction in case of enlargement and may also want to have the possibility to move to another building within the park if needed.

- The impossibility to install certain type of facilities (for example in MSP manufacturing facilities are not allowed)
- Excessive distance of the Park's facilities from High Education Institutions (HEIs) could result in a perception of a weak technology transfer process from the academic world.
- The availability of venture capital and investors is one of the key factors for the growth of SMEs, especially for Science Park's firms, as investors could perceive new technology based start-ups on park as having a higher risk.
- Entrepreneurs could be reluctant to apply for services provided by people who are lacking (or are believed to lack) business expertise.
- Firms could not be able to afford the cost of being part of the Science Park (due to higher rent of spaces) or to take part to paying services provided.

Process gaps are those related to the active hands-on support that Science Park's management provide to their tenants. These include:

- Entrepreneurs' cultural barriers to networking and to experience sharing.
- Entrepreneurs' aptitude about learning.
- Support perceived as being too theoretical and far from firms' day-to-day needs.
- Pedagogical issues, as entrepreneurs could be unwilling to spend time in a classroom.
- Lack of information, about what the Science Park is and what its offer is.
- Support non-customized on firms and on firm's stage of development.
- Lack of time to attend; entrepreneurs and managers are notoriously busy and overloaded with work and could perceive the activities offered by the Science Park as a waste of time.
- Lack of interest and/or motivation.

4.2. The Östergötland County case

The two Science Parks in the County are the unit of analyses of this paper. Both Science Parks are not isolated entities, but they are integrated in a triple helix regional platform, an ecosystem of actors coming from the private sector, the university and local governments at different levels. Figure 1 shows these actors on two circles, having those in the internal circle strongest and more frequent relations with the parks.

Components of this regional innovation system and the relations they have with the two Science Parks are described below.

1. Science Parks

a) Mjärdevi Science Park (MSP)

MSP has been the object of many studies and papers (Hommen et al., 2006) and it is considered as one of the most successful Science Parks in Europe. Founded in 1984 it has shown a rapid growth since its beginning. Nowadays it occupies an area of 70 hectares next to LiU's Valla Campus and hosts approximately 250 innovative companies employing over 6.000 people. Although many tenants deal with IT-related technologies (e.g. electronics, telecommunication and signal processing, software and systems development, image processing, etc.), MSP is a multi-purpose Science Park where innovative firms from every sector can be hosted. The company that manages the Park, *Mjärdevi Science Park AB*, is owned by the Municipality of Linköping and is composed by 5 full time employees.

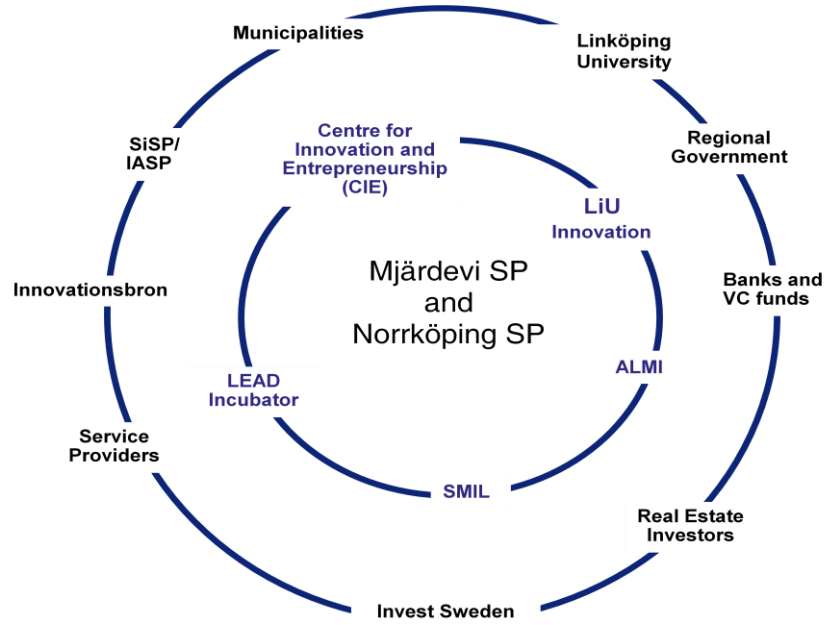

Figure 1 – Regional Triple Helix Platform surrounding MSP and NOSP

b) Norrköping Science Park – (NOSP)

NOSP is a younger Park as it was funded in 1999. Approximately 100 companies join NOSP, employing 700 employees. The park is located in the city downtown, without having a specific geographical delimitation. Innovative firms located in the city can decide to join the park and thus being a "Park's company". As MSP, also NOSP is a multi-purpose Science Park specialized in some profile areas, related to the research carried out at Norrköping LiU campus: visualization, printed electronics and interactive services.

The Park is owned by the *Norrköping Science Park Foundation*, which is an expression of the triple helix philosophy, as it formally involves the Norrköping Municipality, the LiU and the private sectors. The Park is managed by *Norrköping Science Park AB*, owned by the foundation, which is composed by 7 full time employees.

2. The university and university-related actors

a) Linköping University (LiU)

The Linköping University (LiU) is one of the major universities in Sweden, with a student population of 27.600 and 3.800 employees. It consists of four faculties (the Faculty of Arts and Science, the Faculty of Health Sciences, the Faculty of Educational Sciences and the Institute of Technology) and fourteen departments.

Relations between the two Science Parks and LiU are not limited to neighborhood (both MSP and NOSP are adjoining respectively Linköping and Norrköping LiU's campuses). The university is of utmost importance for MSP and NOSP as it provides knowledge (it is not a case that both Parks are specialized in the profile areas at which their neighboring campuses excel), expertise and also customers (university spin-offs located on-park).

The most evident links between the two Science Parks and the university are those established with the Centre of Innovation and Entrepreneurship, CIE, the business incubator LEAD and the innovation office of the university (called LiU Innovation). Nonetheless informal contacts between firms' managers at the two Science Parks and professors and researchers at LiU are not uncommon.

b) *Centre for Innovation and Entrepreneurship (CIE)*

The Centre for Innovation and Entrepreneurship is an autonomous unit at Linköping University, founded in 1994. The main purpose of CIE is to create a fruitful integration between stimulation activities for technology-based firms, and the teaching and research of technology-based entrepreneurship within the university (Jones-Evans, 2007). Its aim is to stimulate the growth and development of technology-based firms, through entrepreneurship and new-business development programs, development programs for established firms, networking and other activities. Due to its success, this experience has been transferred to other regions in Sweden (Klofsten et al., 2010).

CIE has established a win-win relationship with MSP and NOSP: on one hand CIE's activities constitute part of the offer of the two Science Parks and many of the more than 130 new firms established by participants from the CIE's entrepreneurship programs have chosen an on-park location. On the other hand many on-park firms have participated in CIE's activities.

c) *LEAD – Business Incubator*

LEAD business incubator was founded in 2002 and resulted from a fusion of the two business incubators from Linköping and Norrköping. Owned by the LiU (LEAD stands for LiU Entrepreneurship And Development) since 2006, it has two branches strategically located at MSP and NOSP.

LEAD offers a 36-months incubation and acceleration program and assists their companies through high-skilled business coaches. Since its beginnings more than 80 companies have graduated from LEAD.

3. Industry and private actors

a) Foundation for Small Business Development (SMIL)

Created by a group of entrepreneurs to enhance their business skills (Etzkowitz and Klofsten, 2005), SMIL is an organization whose members are technology- and knowledge-based firms in the region. Since its beginnings in 1984, SMIL has expanded its activities from breakfast meetings where lecturers, often from the management department of the LiU, gave talks on subject of interests to a well-defined set of stimulation activities tailored on its members' needs (Evans and Klofsten, 2007). SMIL carries out many activities in close collaboration with CIE, representing a successful example of integration between industry and academia.

b) Other private actors

MSP and NOSP managers have set up an extensive network with other private actors that are crucial for the parks and its firms. Between them there are real estate investors (as MSP and NOSP do not own any real estate properties), banks, capital venture funds and investors.

4. Governmental bodies and public companies

a) Municipalities

The Municipality of Linköping and Norrköping are directly involved in the supply-side of MSP and NOSP. The Municipality of Linköping is the owner of Mjärdevi Science Park AB and provides a 6 million kronas (approximately 1 million dollar) budget per year to MSP's management.

Norrköping Municipality is a member of the Norrköping Science Park Foundation which owns the Park's management company.

MSP and NOSP also have established informal links with other actors, such as banks and venture capital investors, real estate investors and companies providing basic services (restaurants, bars, sport facilities, etc.) within the Science Parks.

b) *ALMI AB*

ALMI AB is a public company, owned by the state (51%) and county council (49%). Its board is made up of politicians, local business representatives and organizations with links to the business world. Their main aim is to "promote the development of competitive small and medium-sized businesses as well as to stimulate new enterprise with the aim of creating growth and innovation in Swedish business life. Its activity covers the whole process from idea to profitable business" (ALMI, 2011). ALMI, beside consultant services, takes part in venture capital activities, providing funds.

c) NULINK

Nulink is a company owned by the Municipality of Linköping, started in 2007 to promote business development in the city. Nulink's mission is to advise, support and inspire for the development of entrepreneurship, the creation of new businesses and business establishment in the Linköping region. It also aims at supporting newly established companies and existing start-ups. Through courses, networking lunches, inspiration seminars, conferences, which are organized in cooperation with order actors, Nulink facilitates the process for the development of new business ideas and creation of new businesses. Another large part of Nulink's support system is focused on practical issues such as finding locals, and accommodation to help new companies to establish or existing companies to expand in Linköping (Nulink, 2011).

d) *ÖSTSAM Regional Development Council*

Östsam Regional Development Council is a regional body made up by representatives of the thirteen municipalities of the region and the county council. Their goal is to promote the development, growth and competitiveness of the East Sweden region.

e) *VINNOVA*

Vinnova is the Sweden Innovation Agency, under the control of the Ministry of Enterprise, Energy and Communications which aim is to increase the competitiveness of Swedish researchers and companies. With an yearly budget of 220 million Euros approximately, Vinnova promotes sustainable growth in Sweden by funding needs-driven research and the development of effective innovation systems (VINNOVA, 2011).

f) *Innovationsbron*

Innovationsbron, Innovation Bridge in English, is a national agency providing early-stage funding to new, high growth companies. Its aim is to promote entrepreneurship at the early stages, mainly through seed capital, generating businesses from ideas. It is owned by the state (84%) and by private industrial partners (16%) (Innovationsbron, 2011).

g) Invest Sweden

Invest Sweden is a national government agency whose main aim is to attract investment to Sweden by helping foreign companies to do business in Sweden. It offers practical information on how to set up and run a business in Sweden gives information on Swedish markets and provide contacts with Swedish authorities. The collaboration with MSP and NOSP is important for delivering the "soft landing" program, by which the two Parks aim at attracting foreign firms.

5. Other actors

a) GROWLINK

Growlink is a networking platform made up by many of the stakeholders of the regional innovation system described in this paragraph. Both Science Parks, LiU, the Centre for Entrepreneurship and Innovation at LiU, SMIL, LEAD incubator, ALMI, The Innovation Bridge, ÖSTSAM Regional Development Council and, on a less active base, also the County Council, the Municipality of Linköping and the Municipality of Norrköping are members of this platform. Growlink supports the planning, establishing and growing of knowledge intensive companies (Johansson, 2009).

b) International Association of Science and Technology Parks (IASP) and Swedish Incubators and Science Parks association (SISP)

IASP, operating since 1984, currently connects 352 members in 72 countries which in turn represent 250.000 companies operating within the global knowledge economy. SISP has 45 members (26 Science Parks and 19 incubators) (Wainova, 2009) and it is also a member of the above mentioned IASP.

MSP and NOSP are full members of both IASP and SISP.

4.3. Bridging the gaps

When designing their offer, Science Parks' managers make an effort to bridge gaps identified in paragraph 4.1 that can be experimented by two types of customers:

- Existing on-park firms;
- Prospective tenants (both technology-based firms located elsewhere and entrepreneurs with a new business idea).

As mentioned above, Parks' managers are aware of the existence of gaps. From the interviews it has come out that MSP and NOSP address gaps in different ways according their *configuration* or *process* nature.

1) Configuration gaps

Configuration gaps are overcome with the static design of the support that Science Park provides to its customers.

Gap 1: *Inappropriate infrastructure*

Where the infrastructure gap is concerned MSP and NOSP can provide flexible spaces to their start-ups, through LEAD incubator, and guarantee the availability of spaces for non-incubated firms; MSP and NOSP do not own the lands in which they are located, so mediation with real estate developers is needed. Tenants also expect a certain availability of basic services which are normally available in every city's neighborhood (e.g. restaurants and bars, nursery, ATM machines, supermarket, post office, etc.) which are available at MSP through external providers and at NOSP, given its location in Norrköping downtown.

Gap 2: *Types of facilities not allowed*

Production activities and facilities are not allowed at MSP. While this decision could be a source of contrast with real estate investors, whose interest is to rent all the available spaces, it builds a strong identity for the parks, showing their orientation to innovation, entrepreneurship and I+D activities, more than on production activities.

Gap 3: *Excessive distance from universities and research centers*

Both MSP and NOSP are located in the immediate vicinity of LiU campuses. This strategic position not only facilitates communication and flows of people and information, but it is also a clear indicator of the strategic importance that LiU has for the Science Parks' growth and for its firms.

Gap 4: *Unavailability of venture capital*

Financing issues are of paramount importance for every business, especially technology-based start-ups and firms which are perceived to be risky (Storey and Tether, 1998). MSP and NOSP face this problem with 2 mechanisms: a) integrating in their network venture capital companies (e.g. Invest Sweden, ALMI AB, banks and venture capital funds) and seed capital providers (e.g. the Innovation Bridge); b) strictly applying their admission criteria, ensuring that only start-ups and firms with high potential growth can meet the requirements for joining the Parks. This would make, in managers' opinion, on-park companies more attractive for investors.

Gap 5: *Lack of business expertise*

Entrepreneurship and management programs, coaching and mentoring, business advisory and all the other services provided by the two parks involve highly-skilled people with business background to avoid the perception that firms' managers could have on the lack of business expertise by the supply-side. To this end the collaboration between the two Parks and CIE, SMIL and Growlink is essential to provide the desired mix of business and teaching competences.

Gap 6: *Budget restrictions*

Tenants of MSP and NOSP do not pay a fee for being located on-park. Firms only pay for the services they are interested in; this is a part of the offer of the two parks "tailored" on firms' needs. However the on-park location is more expensive than a location in Linköping downtown; in this way only firms which are really interested in Science Parks' activities should find favorable the on-park location.

2) Process gaps

Process gaps are overcome by MSP and NOSP by the accurate design of a wide set of activities and services tailored on their customers' needs.

Services and activities provided within MSP and NOSP are briefly described below.

- Entrepreneurship programs are provided by CIE, in collaboration with SMIL, to entrepreneurs and managers of firms at different development stages. These programs represent a valid support instrument for firms at pre-incubation, incubation and also post incubation stage to better develop their business idea and reduce the risk perceived by investors. They normally consist of a limited number of days of classroom and coaching sessions (individually for each firm).

- Other courses are provided to Science Parks' tenants with the help of external experts (e.g. Market and Sales course at MSP, Start Up business course at NOSP).

- Business coaching is considered by Parks' management as a key feature of Science Parks' offer. Coaching is provided within all the courses and programs to attendants through personalized coaching sessions provided by CIE, SMIL and external experts. On a continue basis coaching is also given by LEAD business coaches to incubated firms.

- Joining LEAD is not the only way for firms within MSP and NOSP to take advantage of an incubation environment. Those firms which do not meet LEAD admission criteria o whose entrepreneurs do not want to be incubated, can participate in the "*kick-start*" program at MSP or in the "*start-up*" program at NOSP. Within these programs, firms are assisted during the first 6 months by consultants, lawyers, marketing experts, business coaches and have the possibility to rent spaces at inexpensive prices.

- Science Parks' management has pledged their commitment to networking activities as a strategic tool for the development of on-park firms and of the Science Parks themselves. Although some firms' managers could not see an immediate benefit in participating in networking activities, finding them too "time-consuming" (Shepard and Johansson, 2009) MSP and NOSP are continually fostering networking activities through formal networks (e.g. IASP, SISP, Growlink, etc.) and informal contacts. Through networking, companies gain access to different kinds of supports (including financial) and competences. Networking activities comprise seminars, conferences, meetings, breakfast/lunch seminars and meetings and also social and sport events and entertainment.

- When networks cross national borders, which is often the case, Science Parks' tenants have the chance to enjoy a bigger international visibility. MSP and NOSP are not only formal members of SISP and IASP, but they also join a complex informal networks that allow Parks' managers to provide to their tenants valuable market information, international contacts, expansion opportunities and advise for internationalization strategies (Shepard and Johansson, 2009).

- MSP and NOSP, through external providers, support their tenants where intellectual property rights issues are concerned: incubated firms are assisted by LEAD, the LiU's innovation office deals especially with university spin-offs and the rest of firms can find a valuable support in other firms located on-park which can provide assistance for IPR-related issues (lawyers, consultants, etc.).

Meet managers' and entrepreneurs' real needs is believed to be, *per se*, the best way to avoid all process gaps, as this would make them perceive the added value of the support received, making the delivery of the support more effective.

Supply-side actors are aware that promoting and stressing expected result of each support activity is crucial in reducing process gaps. So, if they succeed in making entrepreneurs understand the utility of their support schemes, entrepreneurs will probably not consider the support as being too theoretical (process gap 3) and they will not show a lack of motivation or interest (process gap 8). If they succeed in showing entrepreneurs and firms' managers the added value of networking and experience sharing activities, process gaps regarding entrepreneurs' cultural barriers toward these kinds of activities (process gap 1) can be bridged. Effective communication with customers also overcome process gaps 5 (lack of information).

Meet real needs also means personalize support on customers, taking into account their characteristics and their different stages of development. MSP and NOSP provide different types of support to entrepreneurs with a business idea still to develop (pre-incubation stage), to firms at early stage of development (incubation stage), to firms recently graduated from the incubation process (post-incubation stage) and to established firms. Furthermore, within the same scheme (e.g. entrepreneurship courses), contents vary according to the type of participants. Coaching sessions are a clear example of this personalized support. In this way process gap 6 can be overcome.

MSP and NOSP face the process gaps regarding pedagogical issues and entrepreneurs' aptitude about learning (process gaps 4 and 2) involving in programs and courses top-level professors from LiU with high experience in business world. To this end, collaboration with CIE and SMIL seem to be a winning choice.

The specific design of each activity is also important in avoiding, or at least reducing, the gaps. For example the entrepreneurship program at MSP called *Entrepreneurship and New Business Development Programme*, provided by CIE and SMIL, consists of ten days of classroom distributed over a period of time of 4 to 6 months. Likewise *Market and Sales Course* keeps participants busy 3 evening hours once a week during 5 months. A good scheduling helps in reducing the gap regarding the lack of time to attend courses and activities (process gap 7).

Science Parks' management experience has shown that firms which have not benefited from the on-park location, and eventually chose to leave the park, had suffered important process gaps. This means that, although configuration gaps have been bridged, the on-park location per

se could not be enough. Probably those entrepreneurs had a wrong perception of what a Science Park consist of, what its offer is and what the expected benefits of an on-park location are.

5. Conclusions

In this study we have analyzed the supply side's view of the support that Science Parks provide to tenants (or can provide to possible tenants), identifying possible gaps between supply and demand sides and identifying how Science Parks try to bridge these gaps.

Supply side actors are aware that unsettled gaps can result in an ineffective support delivery and have a negative repercussion on Science Park's mission and on tenants' performance or advice prospective tenants against the on-park location.

Gaps have been classified in configuration and process gaps. Configuration gaps are faced by Science Parks' managers with the static, or blueprint design of the support that Science Park provides to its customers. Process gaps are overcome through the design of activities and services tailored on customers' needs.

Our findings suggest that, in managers' view, Science Parks work properly when they are an integral part of an efficient triple helix configuration. The case study has shown that for MSP and NOSP would have been impossible to create added value for their firms if win-win collaborations with external actors had not been established. Networking and collaboration with external actors is thus a strategic tool for Science Parks' management upon which Science Parks have based their business model.

Collaborations between Parks and external actors do not need necessarily to be formal. When interviewees had been asked which kind of collaboration their organization has with the Science Parks, it came out that, when the organization does not have a governmental status, collaborations are mainly informal. Thus it is not surprising that these collaboration patterns are based on win-win relations that are nurtured in reciprocal interest.

In supply side managers' view the presence of an entrepreneurial university is crucial for the development and growth of Science Parks and of its firms as it provides customers (university spin-offs), expertise and experts. This finding is in line with literature on the importance that an entrepreneurial university can have for the local economy (Etzkowitz, 2008).

6. Policy implications

Our study generates several policy implications for managers of Science Parks and their stakeholders. One major implication is that Science Park managers need to have a comprehensive view when developing and implementing various activities both addressed directly to tenants but also issues dealing with the image of the Science Park.

Bridging the gaps addressed above needs less configurative orientation and more process orientation. There might be a clear reason why tenants are located at the Science Park (e.g. image reasons) but to be able to reach the real needs of tenants, Science Park managers need to have a very open attitude towards co-operation with a great mix of actors within as well as outside the Science Park context very much in line with a triple helix approach.

7. Direction for further research

There is a need to further investigate gaps as addressed above. Data that makes it possible to compare both the supply and demand side perspectives is needed to get a comprehensive picture of how the Science Park context works. This would contribute identify what can be done to develop efficient Park management, able to reach the real needs of tenants.

Although it is difficult to define what success for a Science Park is, it would be useful to compare different Science Parks to test if the more triple helix oriented Science Parks are, the better they work.

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