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University-Science Park links, a double perspective: Ideon Science Park and Lund University

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Abstract: Universities, the main providers of "local knowledge conduits, state-of-the-art science and technology", and the Science Park, the main entity that stands behind the commercialization of knowledge and technology, are seen as central players that should be highly interconnected in order to determine the targeted economic growth of a region. Developing links between university and industry is seen as one of the Science Park's missions and researchers argued along the time that usually Science Parks fail to achieve this mission. By analysing the opinions of the university and of the Science Park's management, different explanations could be found in order to clarify the issue of university-Science Park links.

Key words: university, faculty, Science Park, links, opinion

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1. Introduction

The outcomes of the "knowledge economy" are thought to reach higher and higher shares in the economic growth of national and international regions. That is why policy-makers seek, through different methods, to foster the creation and transfer of knowledge. In this sense universities are the main providers of "local knowledge conduits, state-of-the-art science and technology" into the region in which they are located (Benneworth et al, 2009:1645-1646) and the Science Park, the main entity that stands behind the commercialization of this knowledge and technology. In order to make the mechanism work and to obtain the desired outcomes, promoting university–industry links owns a central place in development policies.

The issue regarding the development of links between universities and firms has received a lot of attention especially in the Science Park literature since the main purpose in establishing Science Parks are most often the "technology transfer" and "the knowledge transfer" from universities to firms. Gaining access to new research and knowledge in the companies' case and receiving input from outside in the university's case creates a win-win situation (Löwegren, 2003 cited in Stoica 2012)[1]. Based on this framework several studies attempted to analyse if the Science Park succeeds in its role of networks' provider. Studies tried to measure university-industry interaction in terms of links' frequency (Vedovello, 1995 cited in Vedovello et al, 2006; Vedovello 1997, 1998; Bakouros et al, 2002), to find what links are specific to the relationship between academia and industry (Massey and Wield 1992; Westhead and Storey, 1995; Vedovello, 1997; Westhead and Batstone, 1998; Phillimore, 1999; Bakouros et al, 2002; Löwegren, 2003), to find the reasons behind the development university-Science Park links (Stankiewicz, 1986 cited in Löwegren, 2003; Pavitt 1998 cited in Link and Wessner, 2011; Jonsson 2002; Link and Wessner, 2011) and the effects of the links between universities and Science Parks or between universities and industry (Westhead and Storey 1995; Phillimore, 1999; Hall et al, 2003; Squicciarini 2009; Link and Wessner, 2011; Audretsch et al, 2012). In various occasions they reached negative results showing that the level of interaction between on-park companies and universities has a low degree (MacDonald 1987; Massey and Wield, 1992), relatively few contacts are established between universities and firms located on park (MacDonald, 1987; Monck et al, 1990; Hansson et al, 2005) and that Science Parks were in

[1] Paragraph taken from a previous work used as a preparation of my master's thesis

general unsuccessful in establishing network connections between university researchers and companies on site (Mønsted, 2003).

This thesis is an attempt to move one step further than the previous studies through analyzing from both universities' and Science Park's point of view how these relationships are perceived at an individual level. According to Melander's study on a Swedish case (2006 cited in Benneworth et al, 2009) there existed opinions regarding the creation of links. In the late 1990s, creating links with the Science Park was thought to be difficult from the point of view of university's managers even though the university wanted to engage more with the Park. There could be very different points of view among university personal regarding this issue based on the fact that in the end the elements that form the links are the people who can have different targets and different ways of achieving them, thus different opinions. By analyzing their opinions could help in finding out if they affect or not university-Science Park links and how they could influence it. This will increase the knowledge about the Science Park-university interactions due to the fact that until now the faculties' opinions weren't analysed and more than that the focus has been on links in fields such as biotechnology, medicine and ICT, the economical field being excluded; but it is included in this research. Being an exploratory research which uses a case study from Sweden it is expected that there are different perceptions in other countries and that future research will have to develop these differences (Stoica 2012)[2].

The thesis builds on the Science Park literature, insights from studies on network theory and on university-industry links and on first-hand data generated through five semi-structured interviews. Because the research is designed as an in-depth study of the Swedish Science Park, Ideon and its near university, Lund University, the sample consists of three deans and one vice-dean from Lund University and the CEO of the Science Park.

The study is structured in the following way: part 2 presents the objectives of the study and research questions, part 3 describes the theoretical framework and the previous literature on Science Parks in general and then the focus will shift to university-Science Park links, part 4 presents the used methods, part 5 presents the case study and the analysis of the interviews and part 6 compares the case material and draws conclusions based on the most important findings.

[2] Paragraph taken from a previous work used as a preparation of my master's thesis

2. The objectives of the study

The question of why some Science Parks succeed in creating more links with universities located in their proximity has been mainly approached from the companies' perspective. More than that only new technology -based firms were mostly analysed, the service companies and large companies being left aside. This paper presents a different perspective, trying to find out how and why a Science Park establishes links with the university through analyzing the opinion of the strategic persons from the university and the Science Park. In the case of the university, the deans of each faculty are seen as the strategic persons and are thought to be able to express the different views of the faculty's staff. In the case of the Science Park, the CEO was chosen because is thought to be able to express the view of the Science Park management and has insight on how and why the development of links occurs.

Due to the fact that in an exploratory research that will explore which the two actors' opinions are, the formulation of hypotheses might not be feasible.

The questions this study will try to answer to are:

- How do the faculties "see" the partnership with a Science Park?
- How does a Science Park "see" the partnership with a faculty?
- Which are the differences between faculties' opinion and further, the differences related to Science Park's opinion?
- Which could be some the future trends of the collaboration between faculties and Science Parks?

Using the term "see" when posing the research questions has as meaning to find and explore the reasons to develop links with the other partner, if the collaboration between partners has been successful, the expectations and the future trend of the collaboration between each faculty at individual level, whole university and the Science Park.

3. Theoretical considerations and previous research

3.1. Defining Science Parks

The notion of promoting university–industry links and stimulating knowledge-intensive entrepreneurship through Science parks is not new, therefore the theory on Science Parks presents different and numerous definitions. In general they are related with the US original concept initiated by Stanford University and Silicon Valley (founded in 1950) and Boston-Cambridge and Route 128 (founded in the 1960s). The presence of academic institutions and high-technology industry was a determinant feature of these areas and that was why researchers, policy makers and other companies and organisations began to observe a causal relationship between these two actors. From the moment the concept was created, Science Parks have been seen as "organizations bridging research and industry" (Squicciarini 2008: 45). The Science Park phenomenon started to spread also in Europe in the 1980s, but mostly during the 1990s (Massey and Wield 1992; Basile 2011) On the demand side the drivers of Science Parks formation were the governments, the regional policy makers or private initiators that tried to boost the innovativeness and competitiveness of a country or region in order to obtain high levels of economic development and returns from R&D investments. On the supply side, encouraging the flow of knowledge and technology among companies, universities and R&D institutions, promoting the culture of innovation, fostering the creation and growth of innovation-based companies and offering high quality services and locations, have all contributed to the increased importance of science parks (Link, 2008).

However the concept of Science Park may take different forms depending on the region where they are created. In the United States is more prevalent the term of "Research Park", in Europe the concept of "Science Park" and in Asia the term of "Technology Park" (Link and Scott, 2011). The term of "Science Park" will be used further in this paper.

During the time Science Parks have been defined in many ways, "mostly by professional organizations and by parks themselves as a way to define their activities. Common among these definitions is that a park is a type of public-private partnership that fosters knowledge flows—often between park firms and universities and among park firms—and contributes to regional economic growth and development" (Link, 2008:128).

One of the most used definitions in the literature of Science Parks is the one of The United Kingdom Science Park Association (UKSP) which states that a Science Park should have formal and operational links with a university, other Higher Education Institutions or Research Centre, is planned to foster the formation and growth of knowledge-based businesses which usually reside on site and it is actively engaged in the transfer of technology and business skills to the hosted entities (Grayson, 1993 cited in Löwegren, 2003).

The International Association of Science Parks (IASP 2012)[3] definition is very similar with the one of the UKSP and contains the main common features of the different existing models all over the world (70 countries) and the minimum standards and requirements that any project must have in order to be recognised as a Science Park.

"A Science Park is an organization managed by specialized professionals, whose main aim is to increase the wealth of this community by promoting the culture of innovation and the competitiveness of its associated businesses and knowledge-based institutions. To enable these goals to be met, 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."

In contrast with these definitions is the one presented by Luger and Goldstein (1991:5 cited in Löwegren 2003:12) who defines Science Parks as: "…organizational entities that sell or lease spatially contiguous land and/or buildings to businesses or other organisations whose principal activities are basic or applied research or development of new products and processes." As mentioned previously by Löwegren (2003) this definition does not emphasize the existence of a university in the close area, nor the purpose to help at the creation of new firms, a Science Parks being just a location that houses firms engaged in research and development.

Swedish Incubators & Science Parks (SISP 2012)[4] follows the same line as IASP in defining a Science Park. According to its definition, a Science Parks is "a stimulating meeting place for academia, research, the public sector and the industry", has a management function which "stimulates the flow of knowledge and technology among universities, research institutions and

[3] Source: www.iasp2012tln.com/en, 2012-03-31
[4] Source: www.sisp.se, 2012-04-12

companies on the market" and its aim is to encourage the formation and growth of knowledge-based companies, and to rent premises for these purposes.

Due to the fact that the focus of the paper will be on the relationship between universities and Science Parks and because both SISP and IASP definition have as key feature the existence of the university in the proximity of the Science Park these two were used when choosing the case study of the paper.

3.2. Theory on networks

A network could be defined as a combination of actors that participate in relationships which allows them to take part in the same activities that link their resources. It could involve "a dyadic relation…or an entire community" (Johannisson 1994 cited in Löwegren 2003:62) and it could appear under different forms: formal networks which have at base a contract and informal networks which form primarily due to social relations. Through these different networks, an actor could generate and solve technical questions and to increase the opportunities for interactive learning (Håkansson, 1990 cited in Löwegren, 2003).

Networks have been discussed in the literature from different perspectives such as the subjective and objective perspective (Johannisson 1994 cited in Löwegren, 2003) or from the transaction cost economics (Arora and Gambardella, 1994 cited in Dalp, 2003) and network-theory perpective (Powell, 1990 cited in Dalp, 2003).

From the subjective perspective, the main purpose of a network is to control "a changeable and unpredictable environment". The individuals use the network not only to exchange products and services but to shape their own identity and in the same time influence others' identity. The decision to participate in a network could arise due to the sympathy between the actors that take part in a meeting, thus could result from coincidence (Löwegren 2003:63).

According to Johanisson et al (1994), the objective perspective relies on the fact that networks aim to reduce uncertainty by the spread of information and the guaranteed access to limited resources. In this sense individuals are only representatives of the actors-organisations and have to follow specific rules when they interact. To form a network is only a strategic and rational choice where sympathy and trust have a high degree of insignificance.

The transaction cost economics and the network-theory perpective are used especially when explaining networks between universities and industry, especially in the case of biotechnology

and ICT industry. Biotechnology and ICT industry have different views on establishing networks with universities. Information technologies put a greater emphasis on non-university researchers and its development is achieved more due to engineers than to scientists. Biotechnology develops through extensive interactions, more precisely networks between university researchers and industry and indirectly due to other areas of research, present in manpower training or in less visible forms of knowledge spillovers. This happens because in the beginning biotechnology firms are usually formed by academic researchers who use the new knowledge obtained in university and in the same time creates research networks in order to develop a product. The continuous interaction between the firm and academic research has as scope a more rapid commercialization of the product (Dalp, 2003). According to Deeds (et al., 1997) the reputation of the researchers involved in the network helps the firm to obtain specific services, for example finance, thus the university researchers have an important role in biotechnology. The involvement in networks has different reasons: first, due to a limited capacity of the researchers/ small firm to exploit by itself the new knowledge and develop new products, secondly, because it is necessary of more organisations to finance the costly research, networks help to spread the risk of developing new products among partners and to succeed in commercializing the new technology in a previously inexistent market (Walsh, 1993 cited in Dalp, 2003).

The transaction cost economics argues that firms occasionally decide to exchange strategic knowledge with other partners, than to internalize research even though it is more problematic to control information because, for example, developing new products through organizational networks could lead to diffusing strategic knowledge to competitors and stimulating imitation. (Arora and Gambardella, 1994 cited in Dalp, 2003). This exchange of strategic knowledge is made especially through contracts and in this sense it can be related to the objective view. On the other hand the network theory is more related with the subjective perspective putting emphasis on the social norms and values that manage the interactions between actors that may influence each other and that could help them to better understand a turbulent environment (Powell, 1990).

3.3. Types of links between universities and Science Parks

The networks between a university and a Science Park could be formed through different types of links and the typology created by Vedovello (1997) through the research made on the Surrey Research Park is mostly used in the Science Park literature.

There are three categories of links between tenants and university:

1. Informal links: personal contact with academic staff, access to specialized literature access to university department research, attendance at seminars and conferences, access to university equipment, attendance at general education/training programmes.

2. Human resources links: students' involvement in projects, recruitment of recent graduates, recruitment of more experienced engineers and scientists, formally organized training of firms' personnel at university

3. Formal links: engagement of university academic staff for consultancy, analysis and testing in university department, establishment of research contact, establishment of joint research.
(Typology taken from Löwegren, 2003: 41-42)

Thus when reffering to links, this study analyses all types of relations that could appear between university's personal (staff and students) and the companies located in the Science Park.

3.4. Advantages of the existence of links between industry and university

According to the literature on Science Parks, the theory on university-industry links states that proximity and a link to a university creates several advantages, some very valuable and some less valuable. Companies involved in a co-operation with a university get access to the latest knowledge which boosts their competitiveness (Ahuja, 2000; Powell et al, 1996 all cited in Basile 2011); they obtain a higher trust among customers because the link expresses the fact that the products and services are based on the latest knowledge. In the same time, the research being done in the university, the companies could have lower development costs and also use university's equipment; the availability of labor could be another university related resource and it highly valuable in moments of labor force scarcity. Another valuable benefit could be the fact that a well-established link might impede other companies to create the same link thus maybe

missing the latest knowledge which will give other companies a competitive advantage. Among less valuable benefits could appear the seminars organized by the university because they are imitable and accessible to everyone (Löwegren, 2003). In the case of universities the theory on university-industry links presents as university's advantages the increase of the efficiency of certain activities, such as R&D and innovation and the increase of stock, flow and exploitation of knowledge (Baptista, 1998; Feser and Bergman, 2000; Cooke, 2000 cited in Dalp 2003).

When referring to links, this study uses both the subjective and objective perspective and implicitly the transaction cost economics and the network-theory. The theories played an important role when formulating interview's questions while the findings of the interview will help to understand what types of links and what advantages could characterise different faculties and implicitely fields.

3.5. Previous research

Research studies on Science Parks revealed different results related to the question if a Science Park manages to accomplish its role as stimulator of knowledge and technology diffusion, promoter of the culture of innovation and competitiveness, provider of links between companies and between companies, universities and R&D institutions. That is why this paper tries to shed light on one of the missions of science parks, to form links with higher education institutions. By finding the opinion that rests at the base of networks' development between Science Parks and universities it could be better understood why some parks fail in achieving this mission.

The empirical research on Science Parks has had different approaches: researches that have analyzed which factors determine a firm to move on-site, studies which analysed differences between on- and off- park firms' performance, studies focused on the formation of university-industry links and researchers that took a look at the regional level and analysed the value added that a Park brings to a region in terms of innovation, economic growth and development.

3.5.1. Factors that determine a firm to move on-site

The factors that determine a firm to locate on Park have been widely analysed and it can be stated that the most important factor is the existence of links between companies and between companies and higher education institutions. At the beginning of Science Parks' evolution a part of the studies tended to reveal that some firms moved to Science Parks especially based on the

"image and overall prestige of the site" rather than for the access to facilities that the nearby higher education institutions or research centers could offer (Monck et al. 1988 cited in Lindelöf and Löfsten 2002: 868; Ferguson and Olofsson, 1998 and Ferguson, 1999 about Swedish Science Parks). Other studies on the contrary found that for 74% of high-tech companies, the proximity to a higher education institution was most important, on the second place 92% of companies chose the availability of degree programs for employees and on the last places they registered the access to the university's library and research characteristics (Levitt 1986 cited in Löwegren 2003).

Later on, the existence of research facilities and links became a primordial factor to move into the park. Westhead and Batstone (1998) found that U.K. firms would like to locate on a park in order to have access to research facilities and to links with the university scientists. Keeble et al (1999) supported Westhead and Batstone's findings reaching the conclusion that the image was not very important and the firms found Cambridge Science Park helpful in the development of links with the university. The same factors determine US firms to locate on park, argue Goldstein and Luger (1992) after comparing university-based and non-university based parks. Hansson (et al, 2005) in their analysis of the UK and Denmark Science Parks' performance reached a complementary conclusion in the sense that the main reason for a firm to locate on park is to acquire social capital, thus indirectly to have access to links with other companies and university researchers. Parks use the spillover benefits formed due to the existence of links and agglomeration and of which a firm could take advantage when located on-park (Leyden et al, 2008).

3.5.2. Differences between on- and off- park firms' performance

The second approach consists of researches made by Westhead (1995), Westhead and Cowling (1995), Westhead and Storey (1994, 1997), and Westhead, Storey, and Cowling (1995 cited in Link, 2008) who found out that UK on-park firms have a higher survival rate than off-park firms, same conclusion has been drawn also by Löfsten and Lindelöf (2002a, 2002b, 2003) on a Swedish sample; Siegel et al (2003) - found that there is also a difference in research productivity which is bigger for on-park firms. On the other side Monck et al. (1988 cited in Hansson et al, 2005) found that there is not a major difference between on-park and off-park firms when it comes to employment rates, turnover and profitability but that these differences depend more on the age of the firm.

Various differences between on-park and off-park firms are presented by Lindelöf and Löfsten (2001, 2002, 2004 and 2005) who analysed Swedish Science Parks. Their results support the findings of Monk et al (1988) about profitability stating that there is no evidence of a direct relationship between Science Park location and profitability. But the differences that they have found are that on-park firms have more links with the local university, on-park firms have higher employment rates and sales and put more emphasis on innovation. Even though they put more emphasis on innovation they don't have greater R&D outcomes measured, for example, by patents. Analysing also Swedish Science Parks, Ferguson and Olofsson (2004) found a contrary result, that there are not any performance differences between on-park and off-park firms. Squicciarini (2008) and Yang et al (2009) also found contradictory results for respectively Finish and Taiwanese firms. Their results state that actually on-park firms have a greater patenting activity than off-park firms.

3.5.3. The added value that a Park brings to a region

Based on the framework in which Science Parks gained more and more importance among policy makers, many researchers focused on the impact that science parks have upon businesses located on-park and indirectly upon the region. The subject concerning the added value that a Park brings to a region was discussed by Goldstein and Luger (1992). Throughout a success/failure classification regarding the rate of new jobs creation by US Science Parks at a regional level they concluded that parks boost the formation of new business startups. This finding is similar to the one of Shearmur and Doloreux (2000) on Canadian Science Parks who also found that Parks lift the overall employment growth of the region. In the US case, Link and Scott (2006) reached the same conclusion. Parks closer to a university grow faster and they are considered to have an important role in the transfer of academic research, being the facilitators of regional economic growth (Link and Scott 2003b, 2006).

The latest stream of research is mosly focused on innovation, innovation being one of the primordial factors that an economy/region needs in order to grow and to become competitive. In this sense Squicciarini (2008) analyses the role of Science Parks as seedbeds of innovation by comparing the innovative output performance of on-park firms with off-park firms and the change in patenting activity which occurs within a company when this moves into a Science Park. Squicciarini's conclusion is that firms are more likely to patent when located in a Science

Park, the on-park firms presenting a higher coeficient which is always significant and positive regarding firms' patenting activity (Squicciarini, 2008).

3.5.4. The formation of university-science park links

The issue regarding development of links between university and firms has received a lot of attention in the Science Park literature since the main purpose in establishing Science Parks are most often the "technology transfer"[5] and "the knowledge transfer"[6] from universities to the firms, transfers which could be done with the help of links (Stoica 2012). Starting from this fundamental concept of Science Parks many researchers tried to measure the university- science park interaction in terms of networks between the two players, the effects that the links have on the Science Park and on academia and the reasons behind the creation of links between a science park and a university.

- **University-industry interaction**

Vedovello (1995 cited in Vedovello et al, 2006; 1997; 1998), Bakouros et al (2002) tried to evaluate the types of links that are established between on-park firms and university researchers and to analyze the frequency and the importance of these links for both partners. They had as secondary focus to understand how important the physical proximity between the previously mentioned partners is and if this proximity is a primordial factor in consolidating the university-industry links. These studies argue that the linkages between the two partners are very important but in the same time not numerous especially when formal links are analysed. They also found that the proximity it is not a determinant factor in consolidating the university-industry links.

The subject on the proximity of a Science Park with a university or research institution has attracted different opinions and results. In general this proximity is thought to have high importance directly affecting the performance of a Science Park (Gower-Harris 1994 cited in Järvelin and Koskela, 2004). Gower-Harris (1994) argues also that the distance between the two players should not be long, avoiding to hinder formal or informal links between them. On the

[5] , [6] The transfers include hardware products that industries need, transfer of certain techniques developed in the university, solutions to specific problems encountered by the firms, knowledge developed in the university and transferred to the firms by individuals, as employees, consultants or founders. Thus knowledge could be more easily accessible when a Science Park is situated close to the university (Löwegren, 2003 cited in Stoica, 2012)

other side, Vedovello (1997) argues that building and maintaining strong contacts between universities and industry doesn't depend on geographical closeness but it is important in creating informal and human relations links. The literature considers informal links specific to the relationship between the academia and the industry (Massey and Wield 1992; Westhead and Storey, 1995; Vedovello, 1997; Westhead and Batstone, 1998 and Phillimore, 1999) and based on this theory Bakouros (et al, 2002) succeeded to demonstrate that the informal links have been more developed between the firms and the local university, in the case of Greek Science Parks. On the contrary, as demonstrated by Löwegren (2003) on a study on Ideon Science Park the professional links with university are the most developed. Companies appreciate the university's proximity, take advantage of university's equipment also due to proximity and succeed in obtaining trust which is important in knowledge transfer. However, the level of interaction between on-park companies and universities has a low degree (MacDonald 1987; Massey and Wield, 1992) but somewhat higher than in the case of off-park firms (Felsenstein 1994). Other studies also show that relatively few contacts are established between universities and firms located on park (MacDonald, 1987; Monck et al, 1990; Hansson et al, 2005) however firms in Science parks have more relationships with the university than firms in general (Segal, 1985; Bakouros et al, 2002). Bakouros(et al, 2002) argues that a science park acts for the interest of the companies on-site by mediating different networks, rather than trying to satisfy its own interest. Analyzing Finish Science Parks, they found out that the Science Parks focus more on mediating the relationships with universities or other research institutions. According to Mønsted (2003) science parks were in general unsuccessful in establishing network connections between university researchers and companies on site.

On the theme regarding the acceleration of links between firms and academic institutions Massey and Wield (1992) find that a significant number of start-ups were coming from the academic environment but not only following the "entrepreneurial professor" basic model when a university researcher commercialize the findings by establishing a firm in a Science Park (Quintas et al, 1992 cited in Massey and Wield, 1992) but there were also many advice and consultancy companies aiming to help other firms.

A recent and very important study from this paper's point of view is the one driven by Benneworth et al (2009) who analysed the role and involvement of Lund University in the regional innovation system of the southern Sweden by analyzing three large-scale projects among

them university's support of the ICT industry through Ideon Science Park. As presented by them Lund University has always been considered as having a traditional teaching and research institution that wanted to maintain their academic independence and disciplinary borders. In present the university is searching to increase the collaboration with its industrial stakeholders. (Lund University, 2006 cited in Benneworth et al, 2009) and sccording to Melander (2006) Lund University has transformed in a more "entrepreneurial" university. In the late 1990s, creating links with Ideon was thought to be difficult from the point of view of university's managers even though the university wanted to engage more with Ideon. The competition over who should exploit university intellectual property was one of the constraints until the early 2000s and even at each faculty's level there was a resistance against Ideon, a clear example being the Faculty of Medicine that was afraid of a brain drain (Melander 2006 cited in Benneworth et al, 2009:1653).

When it comes to different types of links, the researchers argue that in "engineering-based industries[7]" university-industry links include a high degree of applied research obtained through professional colleges or on-the job training while in "science-based industries"[8] university–industry links are more focused on collaborative research programs and networks (Benneworth et al, 2009).

- **Reasons to develop university-science park links**

Stankiewicz (1986 cited in Löwegren, 2003), in his work about academics and entrepreneurs, found that a company has different reasons for accessing knowledge and therefore to develop networks with the university. Through knowledge gained from the university the companies could solve important technical problems, the university having the role of "trouble shooter"; they could receive general advice regarding company's management and technical program; permanent access to university's facilities and its researchers' skills; access to special types labor force; to reach a greater depth in R&D by linking it with academic research.

Link and Wessner (2011) consider that when initiating a partnership between a company and a university, if the initiative comes from the company, this is acting entrepreneurially or if the university has the initiative, the latter is seen as the entrepreneur. In their entrepreneurial position both the company and the university try to identify a new resources, thus to develop knowledge

[7] e.g. automotives and food industry
[8] e.g. pharmaceuticals industry

in order to create a new product, service or new ideas. As presented in Link and Wessner (2011) there are two types of motivations that the industry has when engaging in a research relationship with a university: the access to complementary research activity and research results and the access to competent university researchers. Furthermore the university helps firms to find solutions to complex problems (Pavitt 1998 cited in Link and Wessner, 2011). Jonsson (2002) argues also about the importance of links with different universities and states that the importance the companies give to them varies to a high degree. The research made on Ideon Science Park shows that for some firms located on the park, the links to university are crucial to their core activity while for others they mean nothing, even admitting that the competences that they are searching for doesn't exist in Lund University. Links to Lund University are important for those firms that are involved in social networks through which they obtain the necessary knowledge that maybe doesn't exist in very many places in the world. The social networks are usually between researchers and entrepreneurs.

From the university's point of view the partnership with the industry has primarily financial motivations. The university is forced due to financial pressures to participate in applied research with a commercial focus. Zeckhauser (1996 cited in Link and Wessner 2011:4) considers that university research and knowledge is a gift to industry necessary in "university's commercial courtship ritual". Cohen et al (1997 cited in Link and Wessner 2011) share the same opinion.

- **Effects of the links between universities and Science Parks**

Studies on the effects that the links between universities and Science Parks determine have revealed various results. Related to the impact that universities could have upon on-park firms, Westhead and Storey (1995), who surveyed firms in 35 science parks in UK, found that firms located in a science park and that had links to university registered a higher probability to survive in a competitive environment. Therefore they argue that the importance of the science park as links' mediator is essential for the survival of small high-tech firms.

Phillimore (1999), in his work on the Western Australian Technology Park, succeeded to prove that both links with university and synergies with other companies foster the firms to innovate. Hall et al. (2003) finds that even though joint projects between firms and universities have lower risks to be cancelled, they present a higher degree of difficulty and delay. Based on the discoveries of Hall et al. (2003), Zucker et al (1998), Westhead (1997) and Squicciarini

(2009) tries to demonstrate that a longer interaction of firms with universities would end profitably for the firms increasing their ability to patent. The conclusions show that if an on-park firm is engaged in R&D activities with the university this has a negative effect on the firms' likelihood to patent, in the short run. But in the long run this effect is reversed, the companies ending to profit from this interaction with the university. The leading place is although taken by the knowledge spillovers from other companies on-site. Recently, Audretsch et al (2012), in his work on university research parks (URPs)[9], analysed the mechanisms behind the demand of "university-based knowledge" and "university-developed technology". Using data on the Department of Energy's Small Business Innovation Research they tried to provide insights on university research relationships and their results show that university-related research is the key in the transmission of knowledge (Audretsch et al, 2012).

Regarding the impact that links with Science Parks have on universities Link and Scott (2003b) found that formal links between a Science Park and a university have an important impact on the university. They lead to the apparition of an increased number of university publications and patents, to receiving higher extramural funding, a better placement of doctoral graduates and superior ability to receive services from famous scholars. Later on, by analyzing the formation of U.S. university spin-off companies within a University Research Park, Link and Scott (2005) found that parks that are older, focused on biotechnology industry, present a high degree of proximity to a university and are associated with better university research environments, have in composition a greater proportion of university spin-off companies. Thus specific science parks have a higher influence in formation of university spin-off companies than on the formation industry spin-off companies. The impact that the partnership has on university is sometimes negative. The university faces an alteration of its effort in teaching time, conflicts between university's openness and industry's secrecy and tensions between university's departments when the industry funds are distributed **(**Link and Wessner, 2011).

As it can be acknowledged, much has been researched so far in terms of links between Science Parks and universities and mostly in connection with the high-tech fields. Central in the

[9] URPs are property-based ventures having contractual, ownership or operational relationships with one or more universities or other higher education institutions (Link and Scott, 2003 cited in Squicciarini 2008:48)

majority of studies' findings is the fact that the linkages between the two partners are very important. But even though they have this high importance, studies found that they are not numerous especially when formal links are analysed. Contrary results were obtained in the case of factors that determine the creation of links, such as proximity, which appears less important when building and maintaining strong formal contacts between universities and companies but it is important in creating informal and human relations links. Recent studies showed that the initiative could come from both of the actors, though having behind different reasons for creating this relationship. Different conclusions were drawn also when analyzing what types of links form between Science Parks, some of them finding that specific are the informal ones while other studies argue that professional links with university are the most developed. Interesting findings are the ones stating that there existed opinions among university's managers; creating links with the Science Park was thought to be difficult from their point of view. Therefore, analysing the opinions of the strategic persons in both organisations could bring important findings that could maybe explain why some of the previous studies reached so contrary conclusions.

4. Data and methods

4.1. Data

The paper will answer the former stated research questions using as level of analysis a case study represented by Ideon Science Park with its near university, Lund.

The decision of choosing these specific Science Park was based on the fact that it is the biggest and oldest science park in Sweden and has all the characteristics that the International Association of Science Parks (IASP) presents and it is a member of the Swedish Incubators & Science Parks Association. Therefore in order to be included in this study, the Science Park had to supply space and facilities and to offer proximity to a university or a higher educational institution.

The data was generated using semi-structured interviews with the manager of the Science Park and with the deans of Lund University. There have been in total five interviews, one with the park manager and four with the deans. An issue was regarding to which faculties of Lund University to interview. Taking into consideration the findings from previous research on how industries act differently regarding the cooperation with a university and the goals of each

faculty, four faculties that could have links with the Science Park were chosen. For example as previously mentioned it is argued that biotechnology industry has more links with the university (Powell&Koput, 1996 cited in Löwegren 2003) than IT industry which could have more links within the industry (Eneroth and Malm 1999, cited in Löwegren 2003). Bengtsson and Löwegren (2000) assume that they work in different ways when acquiring and developing knowledge.

The four chosen faculties are: The Faculty of Engineering, The Faculty of Medicine, The Faculty of Science and The School of Economics and Management. The faculties that were neglected are The Faculty of Law, The Faculty of Social Sciences, The Faculties of Humanities and Theology, The Faculty of Fine & Performing Arts, Campus Helsingborg and The School of Aviation. Initially I didn't want to exclude The Faculty of Law and Social Sciences, thinking that both could have at least labor-links with the Park, but because the deans weren't available for the interviews both were skipped.

I have chosen to conduct the interviews with the deans because they have the highest decision power within each faculty and they are the person that gathers all the opinions within the faculty. An exception was made in the case of Medicine Faculty, where the interviewed person was the vice-dean with special responsibility for innovation and translational research that had an informed opinion regarding the researched subject. This happened due to the unavailability of the faculty's dean.

4.2. Methods [10]

The case study method is used for research in many disciplines but despite this it is usually criticized. This could happen because different aspects are analysed and they cannot be combined to reach a singular result. This approach is chosen in researches where "biographic, authentic, historic dynamics and perspectives" on a particular subject are considered, thus for finding out and analyzing the opinions of the faculties and of the Science Park regarding the links between them is a proper method (Scholz and Tietje, 2002:4).

According to Yin (1994) interviews represent the most frequently applied method when conducting case studies. Interviews are of different types, from structured to semi-structured and in-depth interviews and their effectiveness depends on the type of the research. Considering the fact that this thesis follows a case study strategy and aims to understand not only "what" and

[10] A big part of this chapter is taken from a previous work used as a preparation of my master's thesis

"how" things happen but also why certain things happen, semi-structured interviews seem to have the greatest advantage. This type of interview is often called 'qualitative research interviews' (King 2004 cited in Saunders 2009). Another reason for choosing semi-structured interviews as research method is because the study is exploratory and this type of interviews could be used. Using this method will make possible the generation of a rich and detailed set of data (Saunders, 2009 cited in Stoica 2012).

Another reason for choosing this type of interviews is that according to Saunders (2009) managers are more likely to agree to be interviewed, rather than complete a questionnaire and this could be valid in the case of the deans too. This conclusion was obtained by other researchers, which state that participants prefer to be interviewed rather than fill in a questionnaire (North *et al*. 1983, cited in Healey 1991 cited in Saunders 2009 cited in Stoica 2012).

The main limitation of the interviews is that a number of data quality issues such as reliability, bias and validity can be identified. The fact that other researchers would have problems in revealing similar results, since the interview context, the respondent's feelings towards the interviewer, the interviewer's external appearance etc. affect the answers, could raise reliability problems. (Stoica 2012)

As to regards to bias, there could be both interviewer bias and response bias. The interviewer bias could appear if the interviewer will not be fully trusted by the interviewee and the latter will give only limited information, raising doubts about its validity and reliability. In my case I consider that the interviewer bias was overcome because the deans and the park manager were very open and willing to help. Response bias could appear both in case of the university's deans and science park's managers, their answers being those that show only the positive aspects of the issue, providing in this case only a partial "picture" of the situation. Taking into consideration the responses which were both negative and positive, I consider that response bias was partly overcome. (Stoica, 2012)

Validity problems refer to the extent to which access to the participants' knowledge and experience could be gained by the researcher. By using semi-structured interviews which allowed me to clarify the questions and discuss the answers from a variety of angles and by allowing the interviewees to make extra remarks, the study doesn't present a validity issue. (Stoica, 2012)

Some of the questions were created by using previous findings related to types of links, factors that affect the creation of links, effects of the links and some especially to find out the opinion, the expectations and the trends in links' creation.

The interviews lasted around 60 minutes and during each interview I took as much complex notes I could and immediately after I revised and completed the answers so information's omission didn't have a high level. Afterwards the answers were registered in parallel in a table to ease the analysis and first, each faculty and the Science Parks were analysed in connection with the theory and previous findings and then was made a comparison between faculties and Science Park's answers.

5. Case Study

5.1. Ideon Science Park

Ideon Science Park analysed in the present study was chosen due to the fact that meets the criteria stated in the official definition of the International Association of Science Parks (IASP) and is a member of the Swedish Incubators & Science Parks Association. More than this, "Ideon is undoubtedly Sweden's most forceful science park and with the strongest brand. It comprises many exciting companies in several areas, all clearly reflecting the quality of Lund University's research and education" (Per Eriksson, General Director, Vinnova[11] cited in Lindström, 2008).

A general overview

- Putting a base for industry-university links

In the period 1970s and 1980s a consistent number of Swedish basic industries such as textiles and shipbuilding, were closed down and the most affected region of Sweden was the Southern part, Skåne region (Sporrong 1996 cited in Lowegren 2003). On the background of a restructured industry, the Governor of the region, Niels Hörjel, thought about a joint venture between University and industry, having in mind the idea of transferring knowledge from the university to a Science Park. At the beginning SUN-foundation was established having as major

[11] Vinnova (in Swedish) or the Swedish Governmental Agency for Innovation Systems is Sweden's innovation agency and has as aim to promote sustainable growth in Sweden by increasing the competitiveness of Swedish researchers and companies (source: www.vinnova.se, 2012-05-23)

goal to make functioning this cooperation between university's research resources and region's industry (Bergström Grip et al, 1985 cited in Löwegren 2003). The chosen site was a field near Lund's Faculty of Engineering. The foundation succeeded to get funds from different large companies and in 1983 some investors, among them Ericsson and four other companies, decided to move in the Park, making possible the creation of the first Science Park in Sweden. From the very beginning the purpose of Ideon was to create new companies locally interconnected which could use the expertise present in Lund University (www.ideon.se, 2012-05-18). In present the owners of Ideon are two very well reputed property companies – Ikano Kontor and Wihlborgs Fastigheter AB.

- Premises

Ideon Science Park is located in the proximity of The Faculty of Engineering, The School of Economics and Management and is composed of several blocks named after the Greek alphabet. Alfa houses about fifty small and medium-sized companies and Ideon Agora a meeting place for start-ups, students and entrepreneurs and consultants. Beta houses around ninety innovation companies and Gamma, around twenty companies specialised in the medical field. The companies in the Delta block cover several different sectors and in autumn 2012 will all move in Ideon Gateway, Lund's "new symbol and skyline". In Ideon Innovation there are more than twenty incubator companies (www.ideon.se, 2012-05-18).

- Tenants

The Park started as a success and by 1988 there were about 100 companies located in Ideon. This growth was closely followed by another one from 110 to 160 companies in only three years due to the adaptation of premises in Alfa building for smaller companies. In present Ideon Science Park has 110,000 square meters of office and laboratory premises which more than 260 companies with a total number of around 2000 employees. In 2012 approximately 8% have more than 50 employees, but the majority of them are small with less than 10 employees[12].

The areas in which the companies work are: life science (biotechnology and pharmaceuticals)-19%, business development-7%, ICT-25%, Cleantech-8%, other high technology-16%, services-26%. In the beginning life science was the dominant sector but starting

[12] Source: www.ideon.se/2012-05-18 and Region Skåne database on region's firms, 2012-04-27

1999 ICT overpassed it, in present reaching a higher percentage. Even though cleantech industry is at its very beginning it has a quite good presence of 8% (www.ideon.se, 2012-05-18)

During its existence more than 900 companies operated in the Park and 76% of the companies had close connection with Lund University. Out of 900 companies only 30 had to close down, Ideon presenting a high survival rate.

In order to become a tenant, a company has to fulfill three out of the following four requirements: the company must have connections with Lund University or its faculties, the company must be concentrated on high technology, the company must have a focus on research and development and the company must be growth oriented.

- Ideon Center

The subsidiary Ideon Center AB takes care of the administrative part of Ideon Science Park, having as tasks the development and marketing of the park and creating an environment with high quality infrastructure and services. Among the provided services could be stated receptions, restaurants, telephone, exchanges, postal services and internet connections Ideon Center develops Ideon Science Park by attracting newly started as well as established, growth-oriented research and development companies and in the same time has the marketing function for the already located companies. (Löwegren 2003 and www.ideon.se, 2012-05-18)

- Ideon Business

Until recently the task of creating networks was possessed by Ideon Center AB but due to the high importance of networks this task was allocated to a special entity, Ideon Business. Ideon Business offers networks and advice applicable in different phases of the company's development. The advice can include matters of leadership, financing and business development, patents, law or accounting (www.ideon.se, 2012-05-18).

- Incubator

Ideon Science Park has in total four incubators where innovators can find the necessary stimulation to start and develop a new company: Ideon Innovation is a business incubator that helps entrepreneurs for a rapid establishment of growth oriented companies, the LIFT Incubator is the first incubator for service companies, VentureLab is the university's organisation aiming to help new graduates and students to start their own business and Lund Life Science Incubator is a business incubator oriented to help former life science companies to develop and commercialise

their ideas. The incubator provides strong contact networks and cooperation with external companies, universities, the innovation system and financiers (www.ideon.se, 2012-05-18)

- Ideon Lightfoot Academy

Ideon Lightfoot Academy is a network for small and medium companies located on or off-park where the members can receive advice and gain knowledge in business development regarding the environment, ethics, risk and social problems. In this network specialists in environment and sustainability are present and they try to give individual help due to the existing differences between companies and prepare them for the future challenges (www.ideon.se, 2012-05-18)

- Development plans

Ideon wants to continue its development oriented trend and in present has different ongoing growth projects such as Ideon Open, a new concept created in spring 2012 through which Ideon Science Park wants to become a global innovation hub, a place where academia and public actors can have an open collaboration. Ideon Open will work as a platform for innovative projects and will be focused on the real market demand and to create growth oriented companies. A part of this concept is the Water Innovation Accelerator, WIN project, an initiative of Kenneth M. Persson, professor in water resource technical studies at Lund University. By working with the private and public actors from the water industry, the goal of this project is to create a water accelerator that could help water related ideas to become commercialisable. Another project is Ideon Gateway a completely new building that will become a natural meeting place with 13,000 m2 of office space, conference premises, a restaurant, café, bank, shops and sky bar (www.ideon.se, 2012-05-18).

Analysis of the interview

According to Hans Möller, the CEO of Ideon Science Park, the current goals of the park are to promote growth in society by creating new companies based on "smart innovations" or innovation ideas from university, to create jobs and most important to transfer research and "smart ideas" coming from research into products and finally commercialize them.

Related to the previously stated requirements that a company has to fulfill in order to be accepted in the park, from Ideon's point of view, all of them are important but especially the company has to be growth oriented because sometimes companies lack their ambition to grow.

They usually stop growing, they don't hire more than 5-6 employees. In order to decide if a company is growth oriented, representatives of Ideon Science Park have a discussion with company's representatives.

- Ideon- Lund University interaction

The partnership with Lund University is very important for Ideon and the CEO considers that the park wouldn't have the same size without Lund University besides it. Currently Ideon faces a challenge: the inflow from university is low for the moment due to the fact that Lund is a strong university and successful in raising funds for their own researches and the researchers choose to stay in the university; "Sometimes they stay too long in the university", believes Hans Möller, CEO. This answer and the previous one, that the most important thing to become a park company is to be growth oriented, could show a connection between the attitudes of the two actors'. Already having links with the university has its own importance but it is not primordial. This could be seen as negatively affecting the inflow from the university even though Ideon considers that this decreased inflow is based on the fact that researchers want to stay too much in the university due to availability of university obtained funds or that they are afraid due to former unsuccessful examples.

Ideon has links in general with only three faculties out of eight, existent in the university: The Faculty of Engineering, The School of Economics and Management (student become entrepreneurs due to the entrepreneurship program) and The Faculty of Medicine.

The park doesn't have any link with the rests of the faculties such as The Faculty of Social Sciences, The Faculty of Law, Faculties of Humanities and Theology, The Faculty of Fine & Performing Arts, Campus Helsingborg, The School of Aviation Theology because of the tradition to be focused only on high-tech. When asked why there aren't links at least regarding consultancy with The Faculty of Law the CEO of Ideon answered that usually companies from Ideon need lawyers with high business experience and go to well-known law-firms. Jonsson's finding (2002) stating that the companies especially form links with Lund University through which they obtain the necessary knowledge for their core activity, could be strengthen by this answer. Firms don't want to form for example links with the faculty to obtain advocacy consultancy but they rather prefer well-known large firms even though it could be more expensive.

From the point of view of the park the action of developing links should come from both the faculty and the park. The persons responsible to make links are: the director of innovation Linus Wiedbe from Lund University, the Incubator manager Rickard Mosell from Ideon, Student Venture Lab and Life Science Incubator.

When asked if the Park established enough links with the universities, the CEO answered that "it could always be better" because unfortunately there are many students that don't know anything about Ideon. The park has an active attitude and acts via the high-tech transfer office and lunch meeting with researchers from The School of Economics, Medicine and Engineering. Until 2012 they had around 3 lunch meetings per year and were attending around 20 persons. Now they have introduced 6-7 lunch meetings per year and until now 70 people attended.

- Benefits and expectations

Ideon expects from collaborating with the university to get the best ideas to commercialize them, to help professors and researchers to take the right steps in the beginning of their projects. Then they can turn the project into a firm and help the firm to form and move out the incubator. After the company grows an advantage of being close to the university is that it will find there good competences and former colleagues.

The links between the university and the park give biggest advantages in the case of life-science industry because is a more research intensive industry and it is costly and risky and needs venture capital. By making joint ventures with Lund University it is easier to get funds because Lund University is a strong name.

- The trend in the development of links and the connection with the faculty and Park's opinion

15 years ago Ideon Science Park had more spin-outs from the university and more connections. In present 4 out of 5 new companies come from other resources, for example spin-outs directly from the industry. This situation was favored by the fact that Ideon likes what happens now more because this type of firms has a greater potential to grow.

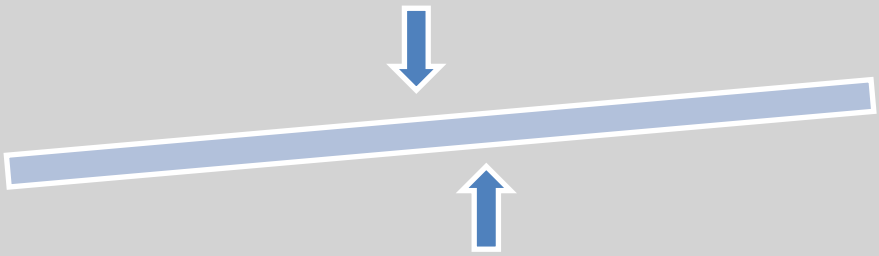
University's opinion also changed over time, as perceived by the CEO of the Park. In present researchers are more afraid to start new businesses because it is more expensive and risky to transform an idea into a product especially in high-tech and medicine field and because there are examples of firms that didn't succeed as expected. This happened because 10-15 years ago those

companies who started in Ideon where not ready to commercialize their products. In his opinion they started too early and Ideon didn't have such developed knowledge how to transform research/ideas in products; they didn't have the high-tech transfer office or innovation managers.

- Future changes

The park would like to increase the inflow of projects, ideas, researchers from universities but this should be a joint effort, and to better assist the projects going out the university. There is a change in Ideon's vision from high-tech criteria to innovation including social sciences. Closest to this implementation is the manager of innovation who wants to build an incubator for people working with all kind of arts, music.

Findings of previous research: - a positive attitude towards developing links with the university
- links with The Faculty of Engineering, The Faculty of Medicine, The Faculty of Science
- the majority of on-site companies-university spin-offs;
- the goal to develop more links with the university.



New findings: - a positive attitude towards developing links with the university;
- the majority of existent links are only with the Faculty of Engineering and Medicine; not many links with the Faculty of Science and The School of Economics and Management;
- 4 out of 5 companies are industry spin-offs;
- the goal to become cross-boundary and to develop more links with the university.

Figure 1. Summary of previous and new findings- Ideon Science Park

5.2. Lund University[13]

Lund University is the largest university of Nordic countries and has a history of almost 350 years of teaching. In present it holds a position of excellence in international teaching and research and hosts around 47 000 students, 2624 professors and lecturers and 6 800 employees. The University is organised into eight faculties, detailed as follows: Faculty of Engineering, Faculty of Science, Faculty of Law, Faculty of Social Sciences, Faculty of Medicine, Faculties of Humanities and Theology, School of Economics and Management, Faculty of Fine & Performing Arts, Campus Helsingborg, School of Aviation and owns several specialised research centers and institutes.

Lund University is subordinated to the Swedish government and validated by the Swedish education authorities. The University receives funds from the government and from external sources through its raising activities.

The leadership of the university is assured by the University Board which comprises the Vice-Chancellor, representatives of the teaching staff and students, and representatives of the community and business sector. The majority is owned by the community and business sector representatives. University's eight faculties are independent and are led by faculty boards, which have overall responsibility for the activities in the faculties. Each faculty's board is formed of member from the teaching staff (the majority), students, and the community and business sector. Education, research and development are generally carried out in the departments and other units led by boards with representatives of teaching staff and students.

The mission of the university is to "understand, explain and improve the world and the human condition" and to be a "welcoming meeting place and a melting pot of new ideas".

The present strategies of the university concern mostly strengthening social sciences, humanities, law, economics and fine and performing arts in its achievement to be largely cross-boundary. The university wants increase their in the development issues that society is facing and to create more effective interaction with the fields of engineering, medicine and science. Lund University has the advantage of having all these fields under the same organization now only having to foster cross-boundary cooperation within education and research.

[13] Sources for this part if nothing else stated: www.lunduniversity.lu.se, 2012-05-19

The four development areas of Lund University are: to offer attractive learning environments through a continuous development of its strong environments for research and innovation, to offer strong environments for research and innovation by serving as an international, national and regional platform, to develop the infrastructure and increased the access to instruments and laboratories which will also provide opportunities for innovation and interaction with society, to increase its international visibility and clarity.

5.2.1. The Faculty of Engineering

The Faculty of Engineering or "LTH" (Lunds Tekniska Högskola) in Swedish was founded in 1961 as an independent institute but today belongs to Lund University and is one of the leading engineering faculties in Europe. It has more than 7000 undergraduates and 800 postgraduates and besides the engineering programs it offers programs in architecture, industrial design, fire safety engineering and food technology. The faculty does world-leading research in nano-technology, combusting engineering and mobile communications, water resources, automatic control, laser physics and biotechnology. LTH is known for its cooperation with different disciplines within Lund University, its cross disciplinary research (e.g. between the medical and technical sciences) and its strong contacts with business life. In the presentation of the faculty, Ideon Science Parks owns an important place. Besides Ideon, LTH neighbors international companies as Alfa Laval, Ericsson, Gambro and Tetra Pak.

Recently, the faculty adopted a new business model based on openness towards Lund University, industry, international universities, society, institutions and colleagues. All this will help it "to create opportunities for people" (www.lth.se, 2012-05-18).

Analysis of the interview

- The partnership with Ideon Science Park

The Faculty of Engineering has the most positive attitude towards collaborating with the industry with which has numerous links. Cooperating with the industry is extremely important because all the programs in the faculty are professional (in the end the students become engineers) and through these links the students can make their master research in a company, which in the end employs them. In this case the theory of transaction cost economics (Powell et al., 1999 cited in Dalp, 2003) is applicable, due to the fact that the links with the industry presents

a greater focus on engineers, students that make an initial research in a company and then get employed as engineers. And from the type of link view, it is in accordance with the opinion presented by Benneworth et al (2009) that in "engineering-based industries[14]" university-industry links include a high degree of applied research obtained through professional colleges or on-the job training.

At the question if the faculty has more links with the Science Park than with firms from other regions the dean didn't know the figures but he said that the collaboration with the park started from the very beginning and that the faculty has links, either personal or professional or both, with almost all the companies in the park and many of them are very close connections due to the fact that many students started their own companies. The fact that the park is very close of the faculty also allows researchers to work part-time in Ideon and in the faculty, thus to have formal links with the park and which is very important from faculty's point of view in consolidating the industry-faculty links. These findings appear contrary to the one of Vedovello (1995 cited in Vedovello et al 2006, 1997, 1998), Bakouros et al (2002) that see the proximity relevant only in developing informal and human resources links. In the same time the findings support Lowegren's (2003) conclusions on her study on Ideon Science Park that the professional links with university are the most developed.

The collaboration was very strong in the beginning, this being the reason behind the establishment of Ideon. The dean doesn't consider that the flow of the researchers from the faculty to the park has decreased and even though there is a trend in Europe to say that innovation is not utilized as much as possible it shouldn't be forgiven that the role of the university is to build knowledge, the university is not a company which develops knowledge for a specific commercial purpose. The faculty has an applied research and this can be used in research centers between universities and companies.

From the faculty point of view the initiative of creating links with the Park should come from both partners. The faculty doesn't have a special organizational structure but the researchers manage to develop the network between the university and the companies. There is also another initiative of the faculty the existence of research portals (e.g. the energy portal) where they can organize meetings between companies and researchers and seminars for the companies.

[14] e.g. automotives and food industry

- Types of links

The existing links between the faculty and Ideon are based on receiving new knowledge from the faculty, the participation of companies' employees in education seminars hold by professors in the park, on labor force, thus all the three types of links that could exist between the tenants of a science park and university. There is not much exchange of equipment. Explained through an example regarding the equipment for cancer research, usually the basic knowledge is at the faculty and the equipment is at the company. Even though the equipment was developed or tested in the faculty it doesn't go back to the faculty. It is preferably to stay in the company so it can be in contact with other companies and introduce it into the market.

- Benefits and advantages for the faculty

The main advantage of this collaboration comes for the graduates that can start working immediately and by working in the small and medium companies is regarded like a trainee position before going to big companies. Ideon also has an important role in helping the faculty in taking the right decision in its strategic plan and future research and projects. The benefit in research is that the number of patents increased and also the attractiveness of the faculty. If the faculty wants to recruit foreign researchers (e.g. from Switzerland and Denmark who have higher salaries than Sweden) it is easier to attract them when "they see other value added: the possibility to start your own company with Ideon", says the dean of the faculty.

More than that researchers seek to form a connection with a park company because when applying for research funds, having a company beside them which can recommend their work increases researchers' chances to get funds. This finding is similar to the one of Zeckhauser (1996 cited in Link&Wessner, 2011).

The theory on university/industry linkages say that the start-ups in a science park are established more on the "entrepreneurial professor/student" conceptualisation. In the field of technology the theory is applicable but there are also established few consultancy units.

- The trend in the development of links and the connection with the faculty opinion

In the beginning the percentage of the people form the faculty working in Ideon was higher. Now they decreased because Ideon tries to develop businesses with other faculties too for example Medicine and Science and the competitiveness increased. Even more Ideon wants to develop business with The Faculty of Social Sciences.

When asked if the faculty's opinion changed over time, the dean answered that they had the same positive opinion. 25 years ago there were criticisms among university personal about mixing companies and universities but now it is a normal and organized/ controlled interaction. He does consider that there is a connection between the development of links and the faculty's opinion.

- Expectations and future changes

Even though the collaboration has been successful until now the faculty would like that the context for the companies to discover collaboration with the researchers to be increased. Due to the fact that in present almost 70% of the faculty employees have to obtain external funds for their salaries, which assumes the same difficulty and effort as starting a new company in Ideon, going into the park will increase even more in the future.

- Other remarks

Overall the faculty's opinion is that Ideon adds value to the faculty and in the same time the faculty adds value to Ideon. The both actors are proud of this connection. From The Faculty of Engineering point of view if the university closes down Ideon will probably close in the future years. The perception of the faculty is that if small-companies on-park are asked about the links with the university they would say that they don't have good access to the university; they don't know who to speak to when they have a need. This happens probably because Ideon is focused more on creating links between companies due to the fact that Ideon already possesses much knowledge. The faculty considers that Ideon should be more involved in seeing what is happening in the faculty.

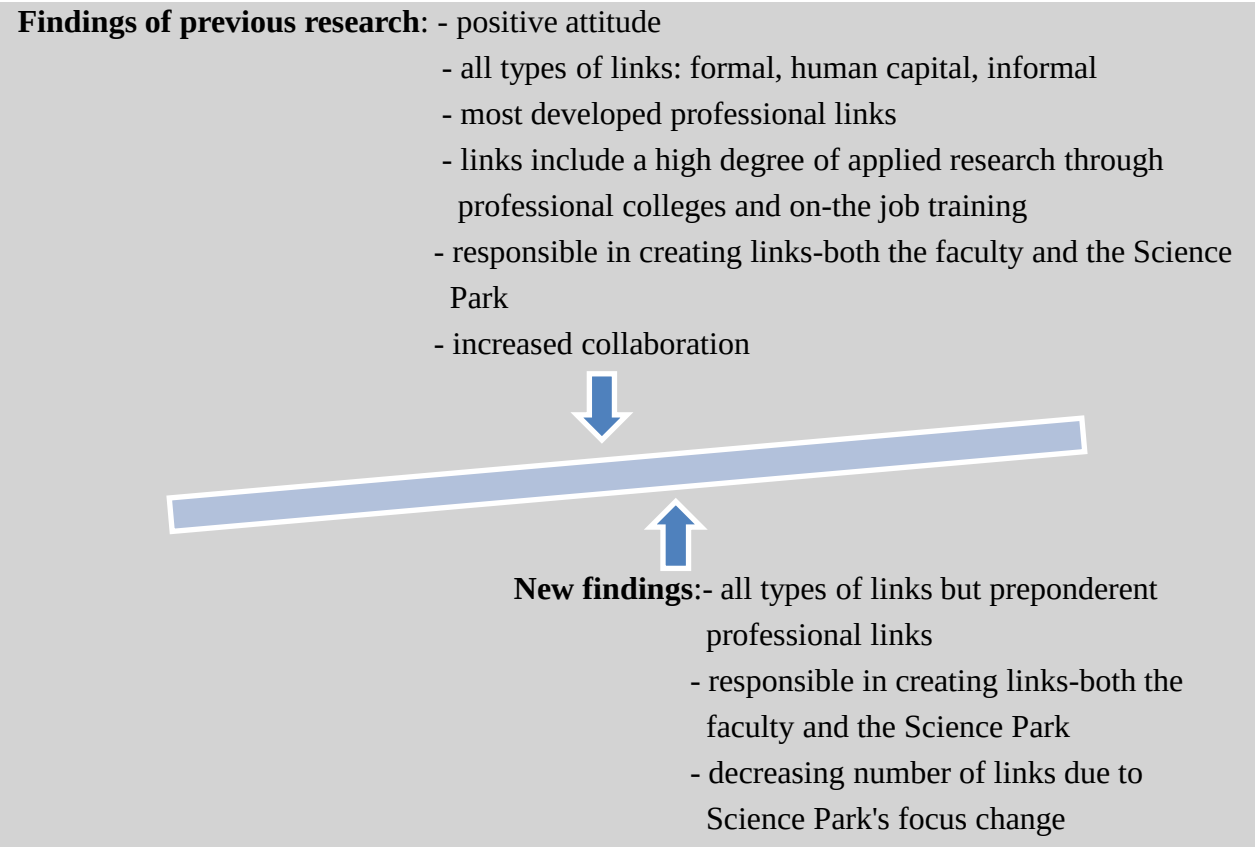


Figure 2. Summary of previous and new findings-The Faculty of Engineering

5.2.3. The Faculty of Science

The Faculty of Science carries out research and has education programs in all the major areas of natural sciences such as biology, chemistry, environmental sciences, earth sciences, physics, astronomy and mathematics. The faculty is composed out of 9 departments situated within the northern University Campus and it counts 800 employees and 1700 students.

The faculty reaches a high rank both in Sweden and internationally and it is known of having close links with MAXlab and ESS, two big research centers in Lund.
In the faculty vision the central place is held by the link between theory and experiment arguing that science is fundamental when constructing the society that has the role of customer in this collaboration. The Faculty management wants to offer a strong support to its curiosity driven researchers by organising the activities into a number of high quality research and education environments, where “department and faculty boundaries do not create obstacles”.

The faculty is aware of its significant importance in society therefore one of its goals is to continue develop strong collaboration with the community. Through this collaboration, the faculty will be able to transfer scientific knowledge to society and one of the actions taken in this respect is to establish an advisory group to coordinate cooperation with the community and by encouraging researchers to establish links with the business sector, politicians and funding bodies (www.science.lu.se, 2012-05-18).

Analysis of the interview

- The partnership with Ideon Science Park

The Faculty of Science doesn't have many links with the industry due to the fact the faculty is doing advanced research but in basic areas not in applied areas and the intention is not to make innovations, the research is more curiosity driven. The faculty is aware that the discovery made by basic research is the basic of great inventions but still it is not important to have links with the industry. The faculty funds its projects with university money or state money and research is made independently. They somehow try to keep the independence and disciplinary borders as it was always thought about Lund University (Benneworth et al, 2009).

When asked if the faculty has links with Ideon Science Park the dean answered that they have, but not to a great extent. The cooperation began in the first part of the 1990s with a company that in present is no longer in the park moved due to the fact that it became too big and the rent was expensive. The faculty cooperated with 20 companies during the existence of Ideon.

The dean has had connections with several companies in Ideon, but not anymore. Almost all the companies that he knew moved outside the Park because they considered that the rent was high.

At the question regarding the responsible to make the connection between the Science Park and the faculty, the dean answered that each researcher tries to make connections. The faculty has a structure that could test the idea, help with the patent but they are not very professional. Here can Ideon enter the picture and can provide the laboratory and the resources and to continue the idea. The faculty receives help mainly from the University's System of Innovation (LUIS) who try to make researchers to present the ideas and then they can continue with implementing it with Ideon. This finding is in accordance with the network-theory of Walsh (1993 cited in Dalp, 2003) referring to biotechnology field in which researchers are those responsible for creating links with

the industry. In the beginning biotechnology firms are usually formed by academic researchers who use the new knowledge obtained in university and in the same time creates research networks in order to develop a product. The continuous interaction between the firm and academic research has as scope a more rapid commercialization of the product.

The start-ups established by someone from the faculty are more on the "entrepreneurial professor". During the period of 20 years only a number of five start-ups began in the science park and only approximatively 10% of the researchers and faculty's graduates become employed in the park.

The faculty has more links with the firms from other regions such as Helsingborg[15]. There they work with a company and the relationship develops like a partnership between 25 professionals. They have expertise in patents, finance, regulations. They can evaluate the idea, they can manage the company and the researcher has the consultancy function or develops the research part. Ideon doesn't have all the chain of competences. The faculty needs professionals from outside for the management functions and to know the rules and regulations. They want another person who can take the management duties because the faculty considers that it is hard to mix the research-job with the management job.

- Types of links

The existing links between the faculty and Ideon are very personal and "the researcher ends up as the friendly consultant", sometimes not paid, the university having the role of "trouble shooter" (Stankiewicz, 1986 cited in Löwegren, 2003). Regarding the professional links they are based on borrowing equipment, competence and new knowledge from the faculty by Ideon. This collaboration happens only sometimes though.

- Benefits and advantages for the faculty

The main advantage in the case of Faculty of Science is to reach out to the market. The climate has been changed, the people are more positive than 10 years ago to commercialize their findings. The collaboration with Ideon increased patenting and publications and gives more courage among researchers due to the fact that they see their colleagues' "exciting journeys" in succeeding to have a company.

[15] City in Skåne Region, Sweden

- The trend in the development of links and the connection with the faculty opinion

The links with the park have grown over time and depended on the fact that the faculty's opinion changed over time. The opinion was harsher and nobody wanted to start a company. In that moment the people in the faculty thought that basic researcher is opposed to economic player. Now they are more open, they understood that making money is not wrong or immoral and that they can invest them back in the research and continue it. And the researchers are more courageous because they saw other colleagues that succeeded and that some of them became rich too.

When asked if there are structures that could hinder relationship creation between Ideon and the faculty, the dean answered that the attitude of the people in the faculty and the lack of money would hinder it. This strengthens other findings arguing that from the university's point of view the partnership with the industry has primarily financial motivations. The university is forced due to financial pressures to participate in applied research with a commercial focus. Zeckhauser (1996 cited in Link and Wessner 2011:291)

The structures that could foster relationship creation are the lunch meetings prepared by Ideon. Only the dean participates and he considers that that people have to discover it by themselves.

- Expectations and future changes

From the collaboration with the Science Park, the faculty expects good ideas to be further developed. "Lund is the city of knowledge and it depends on good new ideas with a commercial value and Ideon is very important in this respect."

The faculty would like to find in Ideon more complex specialists so each one could have multiple competences. For example in the pharmaceutical industry they need information from different areas and Ideon doesn't have this kind of specialists.

The faculty considers that some changes are needed and the dean already arranged a meeting between the heads and the directors of the faculty departments and the innovation manager to discuss the possibility of a better collaboration. Anyway he is aware that will be a slow process.

- Other remarks

Even though the collaboration has not been very close it impacted the faculty in a positive way. The researcher has an opportunity that didn't exist before. Another important thing is that people get motivated when seeing previous results. The dean, who is the leading person of the

faculty, has a positive attitude towards commercializing research, already participating in a number of start-ups as shareholder.

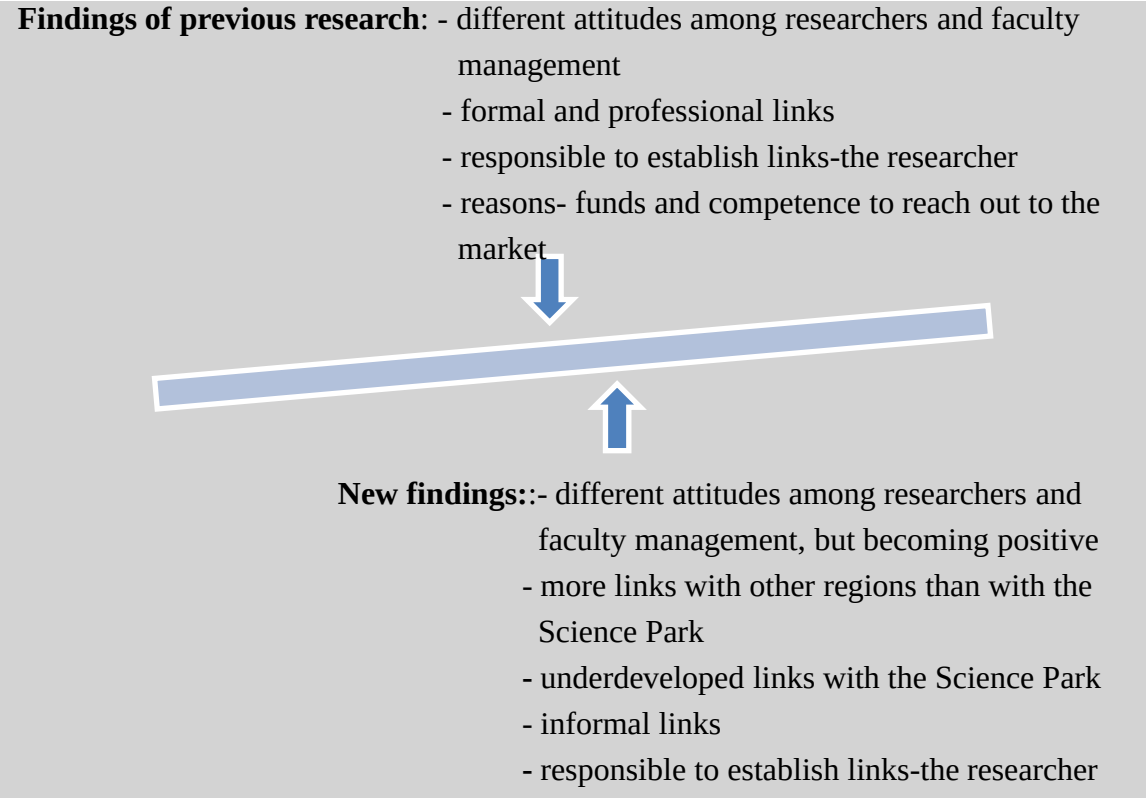


Figure 3. Summary of previous and new findings-The Faculty of Science

5.2.4. The Faculty of Medicine

The Faculty of Medicine carries out research and has education programs in medicine, nursing and health. The Faculty counts 2,800 full-time students, as well as 1000 graduate students and 1,300 employees. The research varies from basic experimental research to applied research which refers more and more to activities that are not traditional university tasks but which are developed on academic proficiency. In the sense of applied research, the faculty tries to contribute in the healthcare field and to enable industrial application of new knowledge and research findings. In order to achieve its role in developing healthcare, the Faculty of Medicine has strong connections with Region Skåne.

Among the goals of the faculty of Medicine there are the desires to produce innovative findings and to be proactive in cooperation with external partners such as biotechnological, pharmaceutical and health care technology industries, with Region Skåne and the municipal health care sector and with providers of research funding to convert medical research findings into commercially viable medical products, diagnostic techniques and care methods (www.med.lu.se, 2012-05-18).

Analysis of the interview

- The partnership with Ideon Science Park

Having links with the industry is very important for The Faculty of Medicine that is why it develops links both with the Science Park and other regions for example Medicon Village. The collaboration with Ideon started in the 1980s when the Park was established. From the point of view of the faculty responsible in creating the links is the faculty central and researchers. The collaboration with the park has been successful until now.

- Types of links

The Faculty develops with Ideon links based on start-ups companies and also rents new knowledge to the companies on park. Thus in the case of this faculty the entrepreneurial approach is mostly met.

- The trend in the development of links and the connection with the faculty opinion

The links with the Science Park have grown over time directly influenced by change in the faculty's opinion. As written by Melander (2006 cited in Benneworth et al, 2009:1654) many faculties "resisted Ideon and its influence". In the beginning the Faculty of Medicine was afraid that a brain drain will occur, the research capacity wishing to take advantage of the entrepreneurial opportunities in the Science Park.

In present there are no major structures that hinder the creation of links and the regional innovation system is a factor that fosters the links between academia and industry.

- Benefits and advantages for the faculty

The main advantage of this relationship is the possibility to innovate and implement the findings of the faculty. The benefits that this collaboration gave to the faculty are an increased

knowledge and its implementation, primary characteristics found also by (Baptista, 1998; Feser and Bergman, 2000; Cooke, 2000 cited in Dalp 2003) as presented in the theoretical framework.

- Expectations and future changes

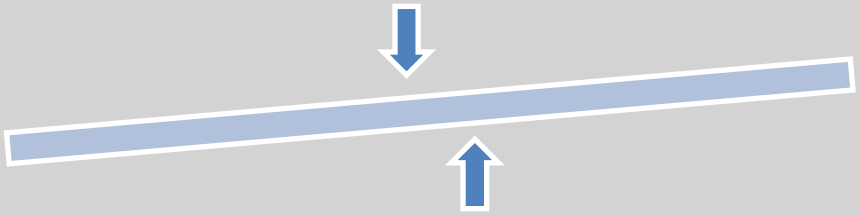
The faculty expects from collaborating with the Science Park an increased clinical implementation, financing and employment. In the future the highest significance for the faculty will have the links with Medicon Village due to the fact that it is specialized on exactly the areas that are present in the faculty too.

The Faculty would wish from the collaboration with Ideon more structure on financial support.

- Other remarks

The role of academia together with knowledge on management is very important in helping the establishment of technologically innovative firms. This could be achieved by having links with the Science Park being in the innovation system and having sponsors.

Findings of previous research: - existence of numerous professional/formal links
- an increasing positive attitude towards links with the Science Park
- financial reasons and increased knowledge and implementation primary when developing links
- responsible to establish links-the researcher



New findings: - existence of numerous professional/formal links
- a more positive attitude towards developing links with the specialized life science cluster Medicon Village
- financial reasons and increased knowledge and implementation primary when developing links
- responsible to establish links-faculty central and researchers

Figure 4. Summary of previous and new findings-The Faculty of Medicine

5.2.5. The School of Economics and Management

The formal development of The School of Economics and Management began in the second part of the 1980s and after organisational changes in 2004 the faculty was establish as a separate faculty within Lund University. The School of Economics and Management covers education and research in business administration, business law, economic history, economics, informatics, and statistics, as well as research policy and it hosts more than 4 000 students and 400 researchers, teachers and other staff members.

The goals of the faculty are to combine innovative research with the business community and the public sector with the academic tradition. The research on innovation and innovation systems

is made in collaboration with CIRCLE[16], often through the faculty's members with dual affiliations.

The relations with the business world are maintained and developed by the Partnership Foundation who invites partner companies to seminars with prominent managers and research specialists making possible the contact with faculty's researchers and students. (www.lusem.lu.se, 2012-05-18)

Analysis of the interview

As acknowledged when going through previous research and theories, the links between universities and science parks regarding the economic and management field were almost not discussed, which is not odd taking into consideration the focus of the majority of Science Parks on high tech industries when it comes to links regarding the change of new and good ideas into innovations, equipment, funds. But when thinking at links based on competence changing and thinking at the fact that the role of the Science Park is to establish different types links with the university it is curious that almost nothing is known regarding the field of economics, important for economic growth. Therefore the findings of the interview with the Faculty of Economics and Management could bring something new in the Science Parks literature.

- The partnership with Ideon Science Park

In the faculty's vision it is very important to have links with the industry. The faculty develops links more with the big companies in the region such as EON Trelleborg and the banks. The faculty doesn't have many links with Ideon Science Park and it doesn't represent a large employer for the faculty either.

Anyway the links should be developed by both parts. From the faculty, the dean and the director of external relations have the role to create the links, but also all the faculty members encourage it.

[16] CIRCLE is "an interdisciplinary research centre, spanning several faculties at Lund University. CIRCLE's mission is to carry out internationally leading and highly policy relevant research. Its fields of research are Innovation, Innovation systems, Entrepreneurship and Knowledge Creation, with a focus on the dynamics in globalising learning economies." (www.lusem.lu.se, 2012-05-18)

- Types of links

The partnership with Ideon started long time ago and it is based more on personal links. The faculty members participate in research lunch meetings at Ideon which are knowledge related and this help the faculty in obtaining information about the business world.

Other types of links concern especially new knowledge which is obtained by the both actors. The start-ups that as faculty spin-offs are more consultancy firms and as to regards to labor only a small number of the researchers (~10%) and students became employed in firms in the science park. The faculty has less commercialization and they offer more consultancy services to entrepreneurs on Park through the entrepreneurship center.

There are also some activities regarding education programs for competence development of companies' employees.

Based on the interview it could be argued that the links between the Science Park and The School of Economics and Management are in general informal, only a small share of the researchers and students (~10%) are seen as labor resources or future faculty spin-off companies. The established companies have more an advice and consultancy focus, finding which comes in supporting Quintas (et al, 1992 cited in Massey and Wield, 1992) when arguing that university spin-offs are not only high-tech companies.

- Benefits and advantages for the faculty

The benefits of this relationship are the corporate connections through which the faculty gets knowledge about how the business world works. The impact that the cooperation with the park had is that the faculty shifted from a basic teaching to an applied one.

- The trend in the development of links and the connection with the faculty opinion

The links develop quite slowly maybe because there are more personally connections which develop slower than professional ones. The faculty considers that there is a connection between the development of the links and faculty's opinion. During the time the opinion became more positive and even though there are members in the faculty that are not involved themselves they encourage this collaboration.

There are no structures that could hinder the creation of links but by building structures that could facilitate a more organized exchange could foster the links. The arrangements for knowledge exchange should be institutionalized.

- Expectations and future changes

The university expects to develop knowledge more effectively given the association with the tenants in the Science Park. The collaboration works well but it should be more developed.

To summarize the findings related to this case it can be stated that the most important links are the informal ones and have at their base knowledge exchange regarding the business environment; the university spin-offs are consultancy and advice firms. There are no links that are based on obtaining financing, equipment and very few regarding labor. Therefore for the faculty the main benefit that this collaboration offers is the knowledge on the business world.

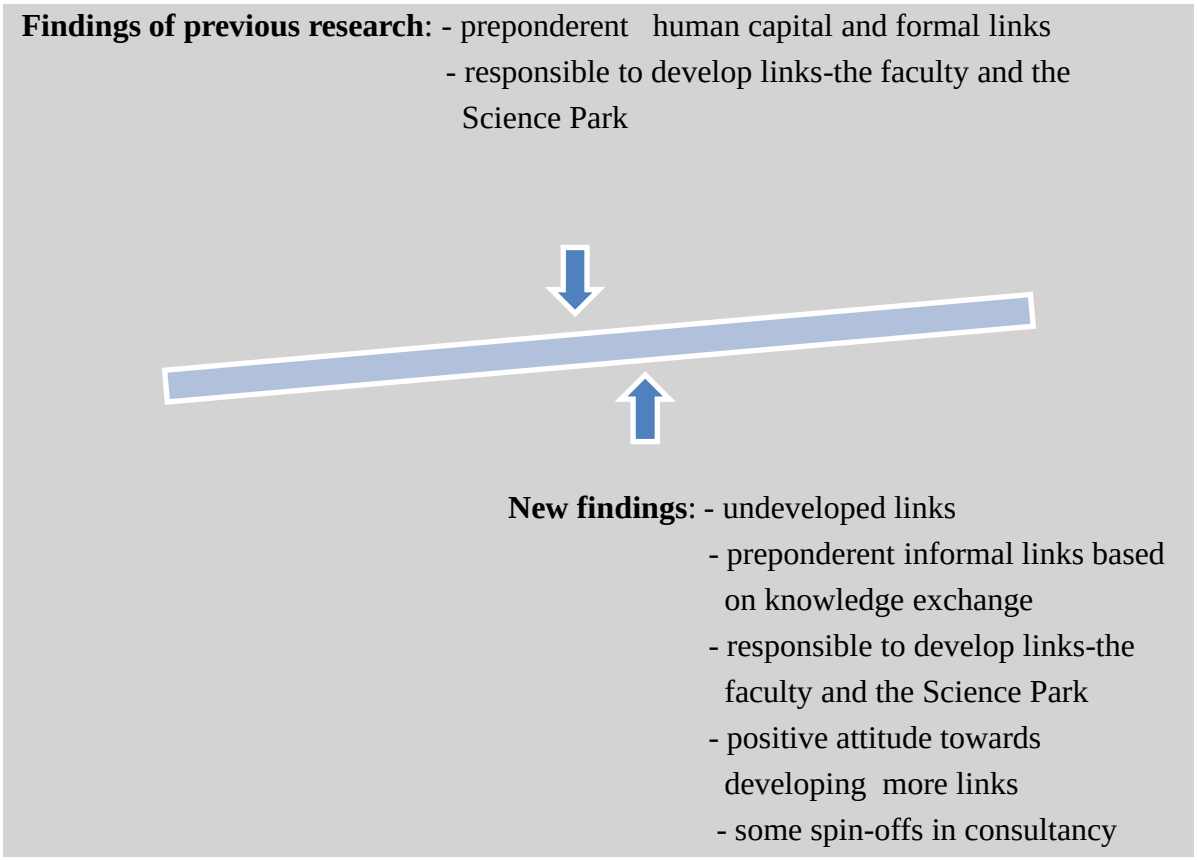


Figure 5. Summary of previous and new findings-The School of Economics and Management

6. Comparative discussion and conclusions

- The partnership between Lund University's faculties and Ideon Science Park

Connecting research and knowledge with industry is a common vision of Lund University as an organization, of each analysed faculty within Lund University and of Ideon Science Park. But on the other hand the deans consider that there are not many links between Ideon and the Faculty of Science and School of Economics and Management and that three (Economics, Science and Medicine) out of four faculties have more links with companies in other regions. The reasons are in their opinion that The Faculty of Science doesn't find the necessary support in terms of funding and competence, The School of Economics doesn't find all the necessary knowledge about the business industry and the companies located on-park are not seen as a major employer and in the case of The Faculty of Medicine, even though it collaborates very well with the park they work better with the specialized life science cluster Medicon Village. The Faculty of Engineering, though, finds a very good partner in Ideon Science Park.

When looking at the answers regarding the entity that should be responsible in creating the links between the two actors there are two types of answers. The Engineering Faculty and The School of Economics and Management consider that the initiative should come from both sides while The Faculty of Medicine and of Sciences consider that the researchers and the faculty central are responsible for creating the links with the Park. This result could be explained by the fact that biotechnology develops through networks between university's researchers and industry and indirectly due to other areas of research, present in manpower training or in less visible forms of knowledge spillovers. The Science Park considers that the action should come from both sides, the park having structures that take care of this, the Incubator manager Rickard Mosell from Ideon; Student Venture Lab, Life Science Incubator. The fact that the researcher, as individual, is the key in creating valuable links with the science park, his/her opinion should be decisive in making this action. This is also believed by the faculties and the park which consider that there is a connection between the development of links and faculty's opinion.

A very interesting finding is that in the case of the Faculty of Engineering, which has a very good relationship with the park and who finds the connection with the park stronger than the one with companies in other regions. It is the only faculty that considers having a decreasing trend of the links with the park. And the explanations of the two involved parts are totally different

showing that it was a failure in the communication between them. The explanation coming from the faculty dean is that there is a higher competition now, when the park tries to establish links with other disciplines too, and it hasn't the same focus as it had when it was established. The Science Park believes that the opinion of the faculty changed due to the fact that in the beginning there were a number of failures among start-up companies from university spin-offs and researchers are more afraid and find more confortable to obtain funds and continue their research inside the university. But on the other side the dean of Engineering affirms that obtaining funds is not easier than starting a company and that many academics would like to start a firm in order to commercialize their findings.

The impact that the connection between the faculties and Ideon has, is different depending on the type of faculty. In the case of Economics the curriculum shifted from basic toward applied research, for Sciences it had an impact on the view of the researchers who became more positive about commercializing their findings and in the case of Engineering and Medicine, increased research implementation.

The changes preferred to be made are also different between the players. The School of Economics and Management and The Faculty of Engineering would like to exist more occasions such as lunch meeting where informal links could be developed, and this is an expected answer considering that the first faculty doesn't have a very developed relationship with the park and that the second faculty considers that the links are decreasing. On the other side The Faculty of Science and the one of Medicine would like more complex competences among the specialists and more structure on the financial support, results in accordance with the requests that these fields of research and industry assume, considering the high level of risk and costs when transforming an idea or a finding into an innovation. Ideon would like to increase the inflow of projects, ideas, researchers from universities the CEO considering that this should be a joint effort; and to better assist (in terms of competences and finance) the projects going out the university. As seen from these points of view, both sides are aware of what they want from this collaboration and what they should do in order to achieve it.

- Future trends

The present strategies of the university as a whole concern mostly strengthening social sciences, humanities, law, economics and fine and performing arts in its achievement to be largely cross-boundary. The university wants to create more effective interaction between them and the fields of engineering, medicine and science. Ideon has the same future plans, those to become cross-boundary. The management of the Science Park wants to shift the focus from high-tech industries to a focus that includes all areas of education and research such as arts, law, social sciences. They see the collaboration between all these fields as a future trend in the development of the innovation process. This could determine the creation of links with the faculties with which there isn't any connection. An interesting finding was the point of view of the Faculty of Medicine when saying that the future in their case is represented by the Medicon Village, specialized in life science. This could make us think about a possible break up between life science, ICT and other industries, in the sense that the locations/Science Parks will become specialized but interconnected with each other within a regional innovation system.

- Conclusions

Creating university – industry links is seen as having great importance but the existence of the Science Park may not determine the formation of better linkages between on-park firms and all the faculties than between the faculties and companies or organisations in other regions. This doesn't mean that the Science Park fails in achieving its mission of networks' provider because this mission belongs in the same measure to the faculties too. There are factors dependent on the Science Park competence but the opinions of the faculty's staff, other than those determined by the Science Park's competences, could affect the creation of links with the companies located on-site. There could also exist different types of network relations depending on the faculty's field and expected advantages such as formal relations to help them reach out the market in the case of The Faculty of Science and of Medicine, informal relations to reach new knowledge about the business sector in the case of The School of Economics and Management and human relations to help graduates to start working in the case of the Faculty of Engineering. Starting from the findings of this research which show that the opinions could affect the creation of links, it would be of great interest to study in-depth the degree of importance that the faculties' opinions could have upon linkages with a Science Park. This could be made by further studies using a sample with more Science Parks from different countries and regions and their near universities.

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www.med.lu.se

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Other resources

Region Skåne- UC Select database with information on Swedish companies

Interviews

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Appendix 1

Questions - Interview with the Science Park's CEO

1. Which are the goals of Ideon Science Park?
2. To be accepted into the park, a company has to fulfill a minimum of three of the following requirements: the company has to be connected to Lund University or its faculties, the company's operations must be concentrated on high technology, the company's operations must focus on research and development and the company must be growth oriented. Which one do you consider most important?
3. Which would be the optimal size of the park?
4. Do you consider that the optimal size of the park is related to whether or not Lund University is present?
5. With which faculties do the firms in the park have links?
6. If there are faculties with which the park has no connections: Why do the firms in the park don't have connections with these faculties?
7. Who do you think it is responsible in creating the links between the science Park and the university? (The university (who) or the science park (who)?)
8. What do you expect from collaborating with the university?
9. Which is the main advantage that lies at the base of Science Park-university collaboration?
10. Has the collaboration been successful until now?
11. Would the science park like to change something regarding this collaboration?
12. Have the links with the faculties grown over time?
13. Do you consider that the Park established enough links with the faculties?
14. Did the science park's opinion change over time?
15. Do you feel that the view of the university changed in the past couple of years?
16. How many per cent of the companies have any kind of connection with the university?
17. For which kind of industry do you think that the links with the university are most helpful?
18. To what extent do you think that the collaboration with the university has had an impact on the university or on the science park?

19. Do you consider that there are structures that could hinder relationship creation between Ideon and Lund University?
20. Do you consider that there are structures that could favor relationship creation between Ideon and Lund University?

Appendix 2

Questions - Interview with faculties' deans

1. What is the goal of the faculty?
2. Does the faculty have links with the industry?
3. How important is for the faculty to have links with the industry?
4. Does the faculty have links with Ideon Science Park?
5. Does the faculty have more links with the Science Park or with firms from other regions?
6. How many on-site firms has the faculty cooperated/cooperates with?
7. When did the collaboration with the Science Park begin?
8. What types of links does the faculty have with the Science Park? (here were explained the types of links according to Vedovello's typology)
9. Which ones has highest significance for the faculty and which ones are mostly met?
10. Who is responsible in creating the links? (The faculty (who) or the Science Park (who)?)
11. What does the faculty expect from collaborating with the Science Park?
12. Which is the main advantage that lies at the base of Science Park-faculty collaboration?
13. Has the collaboration been successful until now?
14. What benefices has this collaboration given to the faculty?
15. Would the faculty like to change something regarding this collaboration?
16. Have the links with the Science Park grown over time?
17. Did the faculty's opinion change over time?
18. Do you consider there is a connection between the development of the links and faculty's opinion?
19. To what extent do you think that the collaboration with the science park has had an impact on the faculty or on the science park?
20. Do you consider that there are structures that could hinder relationship creation between Ideon and the faculty?
21. Do you consider that there are structures that could favor relationship creation between Ideon and the faculty?

Extra questions (some depending on the answers to former questions)

1. Are the start-ups established more on the "entrepreneurial professor" conceptualisation, consultancy or other type?
2. How many academic start-ups began/ are located in the Science Park?
3. How many per cent of the researchers at the faculty are in general employed in firms in the Science Park?
4. How many per cent of the faculty’s graduates become employed in firms in the Science Park?