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'Social Interactive Science Park Twente'



Research plan

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'Towards a Socially Interactive Science Park Twente'

Understanding the motives of employees to (not) interact, utilise the park's facilities and make use of the location

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Abstract

Science Parks are large areas on which companies can settle and which is linked to universities, research centers or other higher education institutions. This report focuses on the Science Park Twente. The problem in this Science Park is that people do not make use of the environment with all the facilities and there is low social interaction between companies. The aim of the conducted research is to gain understanding of this problem, and to provide recommendations for action and further research. To achieve this, several methods were applied: literature research, digital questionnaires, in-depth interviews, and a focus group. Because of the low response rate, it is wise to look critically at the results of the research.

The research showed that a lack of time, a not inviting area and lack of awareness about the facilities are the main barriers that maintain the problem. It is recommended to increase common projects to enhance a shared goal, use information technology to send a digital newsletter or invitations and create a 'Science Park App'. Furthermore create an environment that is besides attractive also interactive, where people can come together. However, literature shows that Science Parks often do not have the envisioned effect of creating unity, but rather result in exclusion.

1. Introduction

1.1 Science Parks as a setting

A Science Park is a setting where large and international businesses may develop formal and working interactions with a particular centre of knowledge-creation, such as universities, research centers or other higher education institutions. The common benefit lies in the knowledge flow, regional economic growth, technology transfer from the university and the creation of networking opportunities (Van Dierdonck & Debackere, 1991).

Due to the firm belief in the crucial role universities could play in promoting technological change, the linkage mechanisms between both sectors have intensified. Consequently, there has been a sharp rise in Science Parks all around the world (Van Dierdonck & Debackere, 1991). A role model has been provided by the world's first university research park near Stanford University (now known as Silicon Valley) in the USA and the Cambridge Phenomenon in the United Kingdom (Van Dierdonck & Debackere, 1991).

The development of Science Parks as a setting in the Netherlands began in the eighties, which makes the concept relatively novel (Van Dinteren, 2009). It was regarded as an experiment in which links between the academic and the industrial environment attempted to be strengthened by fostering interactions among these sectors. Science Parks are a means of bridging the gap between academic science and industry by providing a mechanism for the transfer of technology (Van Dierdonck & Debackere, 1991).

1.2 Science Park Twente

The Science Park Twente, located in Enschede, is a combined area which consists of knowledge-intensive industry and the local university campus. The University of Twente (UT), the province of Overijssel and the municipality of Enschede (representing the Network City) aim to further develop the area into a knowledge-intensive region of in-

ternational stature by promoting activity through the generating and transferring of knowledge.

Regarding the Science Park Twente, Buck Consultants International (2012) states that the location near the campus brings along some major advantages for companies with a focus on research and development, namely access to knowledge, image (‘place to be’), talent and research facilities. Another benefit is the presence of students in the neighborhood which is argued to contribute to the liveliness and dynamics of the area, which are important factors for creativity and engineering (Vrije Universiteit, 2010).

1.3 Rationale for this study

The concept of the Science Park Twente is derived from the will to stimulate multiple usage of space: it is envisioned to be a work location and a space to meet each other. An assumption which is usually made about the setting of a Science Park, is that there is more engagement in personal networking than in traditional industry, and that these networks reflect both social and business concerns (Johannisson, 1998). However, this assumption does not seem to be applicable to the case of the Science Park Twente. Indeed, the main problem for which research is commissioned is that individuals who interact with the park do not make use of all of the space and opportunities the Science Park has to offer.

The latter results in a lack of social interaction between employees of companies and students of the University of Twente. In this report, “social interaction” is defined according to Bolhuis (2004). He describes social interaction as the way in which people act on, react on and influence each other. Active exchange of information between people plays a central role. To interact socially, one needs to have skills, such as: the ability to empathize with others (empathy), ask for feedback, use feedback, give feedback, request for explanation, collaborate and begin a dialogue (Bolhuis, 2004). Because of this lack of social interaction, the aim of the current research is to explore why people at the Science Park are not using the facilities as expected. The facilities which are present at the Science Park will be elaborated in the “Background” section.

2. Background

This section will provide more information on the Science Park in general, and on the Science Park as a setting for health promotion in particular. This will relate to the health of employees and importance of the use of facilities, appreciation of the location and the mutual interaction. Throughout the report, “the workplace” and “the Science Park” will be used interchangeably, as it is an area where the employees of the companies come every day to conduct their work.

The Science Park Twente consists of an enormous area where companies can settle and grow. With 85.000 square meters of office space and 30.000 square meters to still be developed, the Park is a home to roughly 200 companies which are situated in the area. Together, these companies have about 4000 employees. While there is plenty of room for professional affairs such as office space and meeting rooms, there are also facilities on the terrain such as bars and a cinema (www.sciencepark.nl, 2013).

2.1 Stakeholder analysis

In relation to the Science Park, different stakeholders can be identified. These can be divided in terms of how their main stakes affect the park, how each of them impact the functioning of the park in a specific way, but also have different expectations (Jessani &

Reid, 2008). An overview of the stakeholders can be found in table 1. In the following paragraphs, the role and importance of the stakeholders regarding the Science Park Twente will be explained. This stakeholder analysis will give insight in the actors who are involved in the Science Park project, and what their stakes are in (improving) the current situation.

Science Park Twente Management

The main interest of the Science Park management is to increase the attractiveness of the park but also to make sure that the companies located in the park are satisfied with the various level of services and interaction proposed by the Park itself. Increasing the attractiveness is motivated by the will to encourage more firms to settle in the Park, but also to make sure that the companies which are already situated in the park are satisfied with their workplace environment. For its survival, the Science Park Twente management is highly dependent on attracting companies and having them establish their offices in their park instead of picking another alternative location.

As the managers of the park, they hold a very central position in its functioning. Their influence degree is high, since they can take direct action regarding the structure of the park, creation of events, new facilities and so on. They are the main intermediary between the companies, the park and the municipality and the companies and the university.

Company management

The main interest of the Company Management is to be situated in a knowledge rich environment which can benefit their business. In theory, this could match the Science Park environment which includes many other companies and is also neighboring a university pole. Additionally, their other interest is also to have happy employees so that they are productive actors in their firm.

The company management is represented by the decision makers and managers of the companies present on the Park. The Company management represents the customers of the Park and can hereby be regarded as primary stakeholders. It is crucial for the Science Park Twente management to keep their satisfaction level high. Because of this, the company management exert a lot of influence on the planning of the Park. Their power, however, is limited in the sense that they cannot impact the Park setting to make it more attractive which is why they are dependent upon the Science Park Twente Management to do so.

Table 1: Stakeholders and the Science Park Twente

Stakeholders	Main interest/stake	Relation to the setting	Power/influence
Primary			
Science Park Twente management	<ul style="list-style-type: none"> -Increase the attractiveness of the park. -Make sure the currently established firms in the Park are satisfied. 	Want to make the setting as nice and attractive as possible.	High/high: -Can initiate new projects. -Bring forward infrastructure decisions. -Can coordinate activities. -They are the main intermediary.
Company management	<ul style="list-style-type: none"> -Be located in a knowledge rich area conducive to business growth. -Happy employees so they become productive actors in their firm. 	Want the area to be dynamic and make use of the positive image of the Science Park for the image of their firm.	Medium/high: - Influence on the planning of the Science Park. - Cannot impact the Park setting to make it more attractive (dependent on Science Park Twente management).
Employees	<ul style="list-style-type: none"> -Carry out meaningful work. 	Work in an environment which is conducive to health and not only related to working.	Low/high: -They travel every day to their work at the Science park, their opinions counts. -They have little resources to create change on their own (are dependent on higher institutions).
Secondary			
Municipality	<ul style="list-style-type: none"> -Maintain the Science Park as a pole for innovation and entrepreneurship. -Use the added value of the Science Park structure to increase the prestige public image of their city. 	<ul style="list-style-type: none"> -Decision making power regarding any sort of new construction. -Want the area to be attractive. -Keep the citizens happy. 	High/Low: -Need to be consulted if any new building want to be constructed, if new infrastructure needs to be set up outdoors. -Do not intervene with daily activities in the Science Park.
University	<ul style="list-style-type: none"> -Maintain good partnership and collaborate with companies. - Explore added value to research. 	Study in an attractive environment where they can network/interact with companies.	Low/medium: -Interact in some cases with the companies. - Secondary in relations to the daily activities of the Science Park which involves companies.

Employees

The main interest of the employees is to carry out meaningful work and do so in an environment which is conducive to health and not only related to working (for example a nice social environment).

Being the main individuals who travel to the Science Park every day to conduct their work, their opinions count (high influence). On the other hand, they have little resources to create change on their own, and are dependent on higher institutions such as the general company management and the Twente Science Park management to implement any change (low power).

Municipality

Their main interest is to maintain the Science Park as an area for entrepreneurship and innovation, as it can improve the image of the city and contribute to building a positive image. Secondly, they want to keep their citizens happy and maintain a good balance in the town in terms of the urban landscape and industrial land vs. living areas.

The *municipality* is a secondary stakeholder in the sense that they are influencing the Science Park, but do not have a daily role in its functioning. They have little influence on what is going on in the park as they do not intervene with daily activities. They have high power, since any desire for a new building, shop or infrastructure needs to be discussed with them first.

University of Twente

The main interest of the university of Twente is to maintain good partnerships and to work in collaboration with the companies of the Park when possible. They also have a stake in exploring if this can bring added value to the research conducted within the University.

The *University of Twente* is linked to the Science Park, but neither the students or university are the primary users of the park itself (secondary stakeholders). They only interact in some cases with the companies (medium influence) and are secondary in relations to the daily activities of the science park which involves companies (low power).

2.2 Science Park Twente as a setting of health promotion

The Science Park Twente can be regarded as a workplace. As in any other business, health is in its broadest sense regarded as an asset which co-determines the functioning of people in terms of human and social capital. Social capital is the end-product of social interaction, which is a meaningful concept for industry (Gordon & McCann, 2000). According to WHO (1998), "Social capital represents the degree of social cohesion which exists in communities. It refers to the processes between people which establish networks, norms and social trust, and facilitate coordination and cooperation for mutual benefit". By creating networks and facilitating collective action, students and employees are able to promote their chances for future success. In this study, besides the social aspect of health, physical and mental facets are also addressed, which is likely to increase the effectiveness of health promotion efforts (Best et al., 2003).

Higher levels of social capital have shown to imply greater levels of satisfaction and quality of life at work, which enhances overall health (Requena, 2003). Because health provides social capital, health potentially contributes to an organization's value and can be regarded as a useful production factor. For instance, in an emerging knowledge society which encourages the existence of Science Parks as such, positive mental health is likely to be a primary resource for creativity, which is essential for businesses focused on innovation. Contrary, "mental health problems are closely associated with productivity losses (due to sickness absence or to presenteeism)" (Zwetsloot, 2010, p 146). From this point of view, the proclaimed connection between health and the setting of Science Park Twente is linked to the definition of health described by the World Health Organization as being "a complete state of physical, mental and social well-being, not merely in the absence of disease or infirmity" (Zwetsloot, 2010, p 146).

Since “a healthy and vital workforce is a strategic asset to any organization” (Zwetsloot, 2010), executing workplace health management and health promotion is increasingly relevant for organizations. Health, regarded as a threefold concept, consists of a physical, mental and social dimension (Zwetsloot, 2010). This project aims to capture all these parts by investigating social interaction (mental/social) and the use of facilities (physical/mental/social).

Work-life balance is an important aspect of the psychosocial environment of the Science Park regarding health, since students and especially employees are responsible for a diversity of tasks that need to be fulfilled within a certain time schedule. Furthermore, knowledge-intensive industry is about continuous creativity in order to achieve new innovations in a rapid pace, which brings along even more pressure to live up to expectations which are set by the company you work for. These demands of work might disturb the balance between work and life for employees (and students) of the Science Park.

In general terms, workplace health is an important concept since most adults spend approximately half of the time they are awake in this environment (Engbers et al., 2005). Because of this large amount of time, there is a central need to ensure that employees feel good in their environment which in turn will make them strive in their work tasks. It is important to recognize that work can be a source of peoples' well-being even though “work by itself, of course, cannot make a person happy, but a person cannot be genuinely happy if he or she is unhappy at work” (Gavin & Mason, 2004, p. 381). We can try to reformulate this sentence and state it like: Social capital is an important aspect of work well-being and is therefore linked to life satisfaction (Helliwell & Huang, 2005). Hence, being socially involved is conducive to health and well-being (Neutens et al., 2012).

Following from the earlier mentioned statement that interaction creates social capital, which is in turn important for a healthy workplace, the impact of interaction in the workplace is not to be underestimated. Given the described importance of a healthy workplace, the earlier described lack of interaction among companies in the Science Park Twente is something to be dealt with.

3. Theoretical Framework

In order to analyse the situation at hand, a theoretical framework from which research is conducted was adopted. In this section, relevant theories and concepts are described, and are linked to the problem statement.

Settings approach and salutogenesis

At the heart of the settings approach to health promotion is the idea that human beings exist in certain settings, which are defined as places or social contexts where people participate in daily activities, in which an interaction of organizational, personal and environmental factors affect health (Dooris et al., 2007). Employees of the Science Park Twente engage in activities related to their work, education and leisure. These people are influenced by the context in which they act, such as the company they work in, the university, green space and the facilities in their environment.

Furthermore, this approach can be linked to the salutogenic perspective, since health promoting interventions are aimed at altering the context in which individuals interact, namely the Science Park, instead of changing individuals themselves. This social ecological model of health promotion according to the salutogenic philosophy, takes into account the impact of wider environmental determinants (Green et al., 2000).

The Ottawa Charter

According to the Ottawa Charter (WHO, 1986), there are several impacts that are envisioned to be achieved. We want the results of our research to be a guide for the commissioner of which direction they need to go to mediate healthy behavior and enhance interaction to facilitate social capital, create supportive environments and to strengthen the Science Park community to attain this. By integrating health into the context of the Science Park, it can be regarded as a health promoting setting.

Systems approach

A system is often defined as 'a set of objects together with relationships between the objects and between their attributes' (Dooris et al., 2007). The Science Park is a system which is made up of several sub-systems, such as the businesses and the University of Twente. These sub-systems all have an individual pattern of interaction internally and consist of inter-relationships and inter-dependencies with other parts of the system.

Luimstra (2011) emphasizes that in order to create ultimate opportunities for social interaction and knowledge exchange, physical or functional and relational distance need to be accounted for. The physical or functional distance means the actual distance between individuals who are (potentially) collaborating. Relational distance signifies the degree of cognitive conformity, which indicates that individuals must understand each other to be able to team up together and exchange ideas (Nooteboom, 2006). Hence, social interactions within a Science Park are subject to the forces of the functional and relational distance, which create both barriers and opportunities for these formal and informal exchanges within the system.

A key concept which refers to the nature of such a system is the fact that they take inputs, such as people, resources and information; change them in some way and return the changed input as output to the environment (Dooris et al., 2007). Accordingly, businesses in the Science Park generate new innovations as output; the University provides students with knowledge and delivers them as skilled employees.

In this perspective, Luimstra (2011) reveals a paradox for knowledge-based industries: openness and sharing versus hiding information and knowledge for competition-related considerations or closeness. On the one hand, a core concept of Science Parks is the existence of open innovation and interaction with the environment, which entails the capability to make use of other's knowledge for the development of new products and services. Contrarily, there is a need to make it a "gated community" with limited access and therefore creates a barrier for social interaction amongst employees of different companies located at a Science Park (Hoeger & Christiaanse, 2007).

Furthermore, systems thinking argues that interventions to alter work setting characteristics, lead to changes in individual behavior and on the level of the organization. This idea of modifying the context or systems is compatible with the settings approach and can be applied to the case of the Science Park.

Empowerment

Empowerment is one of the core concepts in community-based health promotion programs. It refers to 'the capability of people to gain understanding and control over personal, social, economic and political forces in order to take action to improve their life situations (Judd, Frankish & Moulton, 2001). In our research, it is attempted to under-

stand the capacity of the system in which employees of the Science Park act. This means encouraging social interaction between those different actors in order to achieve positive health outcomes in terms of improved health. The Science Park provides an attractive green environment where facilities are present; a supportive environment facilitating learning and as such can empower individual employees to have control over the determinants of their health.

Sense of community

McMillan and Chavis (1986) define sense of community as "a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members' needs will be met through their commitment to be together." (page 9). This is relevant to the case of the Science Park, as it evokes shared needs which different parties can have: utilising the lunch breaks in a meaningful and healthy way for example. Creating a sense of community amongst the employees on the science park and the students can lead to community participation and development.

McMillan & Chavis (1986) propose viewing the concept 'sense of community' as constituted by four elements: membership, influence, integration and fulfillment of needs, and shared emotional connection. By targeting these four factors, a sense of community can be enhanced, and with it the (quality and quantity of) interaction between parties.

4. Methodology

In this section, a research question will be put forward in order to explore the main issue at hand: the lack of interaction among employees of (different) companies. Subsequently, a description of the applied research methods will be given, shedding light onto the approaches used, how they were used and why.

4.1 Research questions

The lack of interaction between employees from different companies is described as problematic by the Science Park management. The commissioners want to explore ways in which they can enhance the interaction as the current functioning of the park is not in line with their vision and expectations for the Science Park. To do this, the first step will be to analyse the existing situation: how did it come to being, and what (if any) change do the stakeholders want to see implemented?

The following research question which will guide our research on this issue is devised as follows:

Why do the employees in the Science Park area of Twente (not) make use of the existing facilities of the science park and what are reasons to (not) interact?

To guide our research, sub-questions which apply to either one or both of two different aspects - facility use and social interaction - are formulated:

1. What can be learned from other examples of multiple uses of space and social interaction in other Science Parks?
2. To what extent do the employees experience functional and relational distance regarding social interaction and facilities in the Science Park?
3. What is the opinion of the employees about opportunities and barriers regarding the existing social interaction and facilities in the Science Park?

The main aim of the research is therefore to understand why the employees of the Park do not make use of the surrounding facilities but also to investigate if they interact with the employees from the surrounding companies and if not what are the barriers and exciting opportunities for this process. This will be done by understanding how the physical environment impact the work environment and by investigating how employees relate to each other.

4.2 Mixed methodology

The fieldwork of this study was conducted between 1st of April 2013 and the 12th of April 2013. In order to explore the functional and relational distance, , the following methods were applied: a literature review, in-depth interviews with key representatives, questionnaires and a focus group. This combined methodology was used in order to strengthen the validity and reliability of the research. All respondents who participated in the research will remain anonymous.

Literature review

A literature review was executed to investigate practices in settings similar to the Twente Science Park and workplace health promotion. It was sub-divided into three different parts. This literature research will give insights into multiple uses of space and social interaction in other Science Parks, to answer the first research question.

First, a report provided by the commissioner from Buck Consultancy International 'Innovative Campuses' was analysed to get a clearer perspective on the Science Park as a setting in general. Secondly, general cases of existing science park/industrial settings were explored in the Netherlands but also in other locations. Lastly, a workplace health promotion dimension was added to observe the role of health in dual settings in order to relate the science park concept with health promotion factors which can enhance the quality of life.

Additionally, the literature review helped construct the focus group questions, interviews and questionnaire by providing points of focus drawn from previous findings.

In-depth interviews with key representatives

In-depth interviews were carried out to explore needs, barriers and opportunities regarding social interaction and facility use and functional and relational distance: the focus of our second and third research question. Three key representatives of the Science Park were interviewed: the commissioner working for the Science Park project, a representative of the municipality and a representative of the Raedthuys Groep. In selecting these individuals for the interviews, the systems approach was held in account: individuals from all levels of interest were approached. Theory suggests that by asking these people to give their opinion and participate in research, they can become empowered and gain a sense of community.

The project commissioner was contacted and interviewed at the very beginning of the research process. This helped to attain a clearer image of the rationale behind the research which needed to be conducted, but also to grasp the specific expectations for the project. This representative was interviewed at the Science Park in Enschede to get answers to questions surrounding the challenges faced but also to get a first impression of the location. The focus of the interview was the current use of space and present infrastructure, the expectations of the commissioner regarding the project, conflicts of interest and power relations between different stakeholders, perceived viewpoints of employees regarding facilities and social interaction and suggestions.

A municipality representative of Enschede was approached for an interview in the early stages of the research process. He agreed to do a phone-interview about the

stance of the municipality on the current issues, these are the added value of the Science Park for the municipality of Enschede, the role of the municipality in the functioning of the Park, what is currently lacking regarding facilities and why, potential explanations for a low degree of social interaction, and events.

Lastly, a representative of the Raedthuys Groep was met for an in-depth interview about the issues from the perspective of her company. The Raedthuys Groep is situated in the Science Park area and works in the 'green energy' arena. This representative was interviewed in the office building of the company on the topic of the ideas she and her employees held regarding the Science Park. Topics which were discussed are the current situation in the Raedthuys Groep, the environment, things that employees want to see changed, the link between the university and the Science Park, and suggested solutions to current problems regarding interaction between companies and employees.

The interviews were performed according to a semi-structured format including pre-planned key questions and topics. Nonetheless, the questions were open-ended, which created room for the participants to expand on the subject. The interviews were carried out face-to-face or via telephone. During the interviews, detailed note taking was used to record the actual words and content of the respondents' answers.

Questionnaires

In order to explore the sense of community and experience of functional and relational distance among employees in the Science Park, again regarding sub-questions two and three, a questionnaire was developed. In the following paragraph, the process of the data collection will be elaborated upon. The included questions can be found in the 'Results' section, where the answers to them are also provided.

Two websites were used to collect e-mail addresses of companies, in order to recruit respondents among the Science Park employees for the digital questionnaires (<http://www.ovbsp.nl/leden/> & <http://www.sciencepark.nl/nl/bedrijven/>). To ensure the highest possible response rate, no pre-selection of companies was made.

First, an email was sent to inform companies about the questionnaires. If they were not interested in participating, they could reply by email. Those who did not respond to this email were automatically involved. According to www.sciencepark.nl, there are 300 companies located at Science Park Twente. Since some companies keep their email-address private or are not registered, the final number of recipients amounted to 128 companies.

In 8 cases, the e-mail was not received by the specific company for unknown reasons (e.g. incorrect e-mail address) and eventually, the email only reached 120 companies. Furthermore, we retrieved 5 e-mails with an 'out of office' or 'your request/email will be processed' notification and it is therefore unsure whether the email was read.

Subsequently, 115 companies and 5 individuals who wanted to be involved, received an e-mail including the link to the questionnaire. Eventually, a reminder was sent to the companies to fill in the questionnaire before the final date. Ultimately, 42 individuals responded to the digital questionnaires.

The questionnaire focused on three specific themes: the environment, social interaction, and facilities. Questions were asked in several formats. Some were to be answered on a five point Likert scale, ranging from 'disagreed' to 'agreed' where 1 is total disagreement and 5 is complete agreement. Furthermore, there were close-ended yes/no questions, which can be found in the results paragraph (p. ...). Also, open-ended questions about the motivations people have to perform their current behavior were posed,

but also on the topic of solutions that they could think of. The open-ended questions can be found in the appendix I. Concluding the questionnaire, there was space for additional feedback or remarks on the research topic.

The answers to the open-ended questions were categorized by summing up all of the answers in a Word document, and putting them in a table in accordance with their degree of similarity. All the similar responses were then placed under the corresponding category and put into on data table. Because of the large amount of data from the open questions, the results for this part are put in the appendix II.

Focus group

Information on the focus group date and location was sent to the same 115 companies as the questionnaire. Following this, four individuals replied they were interested in participating: three individuals working in the Science Park/University of Twente and one member from the municipality of Enschede.

Subsequently, a dual moderator focus group of 25-minutes was conducted, in which one moderator made sure that the discussion kept going, while the other focused on the coverage of all the topics. The topics covered were: working environment, interaction within the Science Park, interaction between the Science Park and the University, barriers and opportunities for social interaction and the use of facilities. The focus group took place in a building at the Science Park and was fully recorded.

Upon their arrival, the participants were given an ‘informed consent’ form and an information sheet they had to fill in. This included their age, gender, work position and the amount of time they were working in the park. Refreshments and food were provided and at the end of the focus group, the participants were given a small gift.

The focus group discussion complemented the in-depth interviews and questionnaires, since reasons for not using the park could be further discussed.

Additionally, the focus groups served as an interactive learning process for the employees themselves as they met other employees from different companies and discussed together ways in which they can improve the quality of their working life by taking more advantage of the area they live in and also interact more with others.

5. Results

This section contains the results which were gathered through the mixed methods approach and includes the findings of the literature review, questionnaires, in-depth interviews and focus groups.

5.1 Literature review

Experiences of other science parks

Benefits and limitations of the Science Park model were outlined in the literature including interaction between the Science Park and University, the importance of a stimulating environment and a sense of community.

According to a study conducted by Lofsten and Lindelof (2001) in Sweden, Science Parks can be positive for businesses as they help to generate sales and jobs. According to them, this could be linked to the motivation of entrepreneurs who decide to settle in the Science Park but also to the benefits of the science park location. Another high benefit for companies when locating in science parks is to be able to interact with

other companies and subsequently exchange knowledge and interact, which in theory would lead to more innovation. A study conducted by the Royal Haskoning (dutch consultancy engineering and management organization) on Science Parks in the Netherlands concluded that this was partly true in the six Parks surveyed:

"There is above-average investment in R&D and there are collaborations between companies and the university and among the companies – even if this only applies to a third of the cases. So by and large the opportunities are there, but it is only a limited number of the businesses that make use of them." (Royal Haskoning, P.23).

Limitations existing within the Science Park concept were also encountered. Chan and Lau (2005) argue that even though in theory Science Parks represent a good opportunity for several companies and a University to collaborate, in practice this is not always the case. In fact, according to their study conducted in a Hong Kong Science Park, each individual company present on the Park demonstrated a tendency to stay in their own corner and not favor social interaction with the other firms present because they felt they had little in common with them. In this sense, they state that "the so-called networking events, social party, facilities for tenants to meet and talk, informal or formal gatherings, etc. cannot serve the linking function" (Chan & Lau, 2005, p. 1226) and "that technology start-ups don't seem to gain any benefits from networking" (Chan & Lau, 2005, p. 1227). However, the linkage with the university is seen to be important in terms of product development process as the companies can make use of technology provided by the university and therefore the value in this relationship is supposedly higher than the firm to firm value.

Social interaction between science park and university

Quintas et al. (1992) researched how Science Parks could link the academic sphere of the University to industrial activity. In fact, the Science Park is often seen as a space where academic "research might commercialise their outputs, or where firms might locate in order to access academic expertise and research results" (p. 161). This implies a certain degree of collaboration between the Science park and the University. However, according to the results of their research in the UK, in many cases, the interaction between both spheres was quite low in terms of formal interaction. In this sense, they conclude that "the research findings from UK suggests that the science park concept is fundamentally flawed in its premise that universities and polytechnics are reservoirs of knowledge to be tapped merely by siting property developments nearby" (p. 172).

In addition to this specific information on Science Parks, in various studies it is also suggested that urban parks have been known to facilitate social cohesion by creating space for social interactions (Peters, Elands & Buijs, 2010). Hence, improving the green environment of the Science Park is not only pleasant to the eye, but also an important tool in creating opportunities for meaningful encounters.

Sense of community

In other studies, it was shown that having a sense of community is beneficial for interaction between different parties in an environment (Chavis & Wandersman, 1990). Cicognani et al. (2007) have provided evidence that sense of community in students leads to social participation, which is positively linked to social well-being and is therefore relevant to health promotion. The access and provision of social support which would be created is 'almost inevitably beneficial for the promotion of health and being a

member of a genuine community' (Thornes, 2001: p. 41). Enhancing the sense of community might benefit the goal of strengthening community action, as stated in the Ottawa Charter.

5.2 In-depth interviews

Lack of communication and focus on networking

The Science Park area is regarded as being very important for the municipality as the education and income level are not very high in Enschede. They wish to counter this through the use of the Science Park and reverse the tendency by attracting highly educated people. In this sense, the municipality has high hopes and ambitions for the location which they consider as an important added value for their city. In the interview with the representative of the municipality, it became apparent that there is a lot that they wish to change. The main points of discussion will be discussed in the following section.

Regarding general communication, resources seem to be lacking to conduct effective communication in several cases. In fact, the representative stated that reaching the right people was difficult and that he attempted to invite companies to work together in order to solve issues, but that a lot of companies were not always available. Underlying to the communication problem is the fact that workers are not always aware of events that are being organized in the Science Park which, according to the municipality representative, often occurs because of the lack of coordination and not knowing exactly whom to speak to promote events. This holds also true for the facilities: a lot of people are unaware of their existence.

Furthermore, an important point which was discussed during the interview is that in the opinion of the municipality, the networking function is the main target which should be attained in opposition to the use of surrounding facilities around the park. In fact, it could be a little too ambitious to expect employees to make use of the facilities around the area as they come there to conduct their professional activity and probably want to go home after a full day of work.

In line with what is found in literature, the representative of the Raedthuys Groep stated that people would get out of their building more if the environment would invite them to. The representative was very enthusiastic about creating a shared goal with employees of other companies, and thought that this might improve social interaction. There was also the notion that the Science Park offered a big deal of opportunities regarding the environment: there were nice areas which just needed some patching up, and there are in fact great facilities but they need to be advertised for more. In other words, there are opportunities, but just need to be seized.

In order to provide a coherent structure in the interviewees' statements, a detailed table of the strengths, weaknesses, opportunities and threats (SWOT-analysis) was constructed. The SWOT-analysis can be found in appendix III.

5.3 Questionnaires

Point of view from employees

In this part the most important outcomes of the questionnaires are presented. Table 1 illustrates the results of the 5 point Likert scale (1 -not true- represents the lowest score and 5 -very true- represents the highest) in the first part of the questionnaire. In this part, 9 statements were given about facilities, physical activity, social interaction and the environment. In the table, each statement is given with the average score of the Likert

scale and the total number of employees who responded to each statement. As can be seen in the table, two statements score below the average score of 3. These can be found in the statements that most employees do not know individuals from at least 20 different companies in their work area, and that they do not think they have enough time to work out or go to the gym after/before work. On the other hand, it can be seen that most employees are happy with the environment they work in, and think that the Science Park is an attractive area to work in. The ‘Enjoy spending time with my colleagues’ statement got the best score from the employees.

Table 5.1: Statements on environment and social interaction

Statement	Average	N
I am happy with the environment I work in.	3.6	42
I think there are enough activities in the area I work in.	3.1	42
I think the Science Park Twente is an attractive area to work in.	3.4	42
In general, I think I have enough time to work out or go to the gym after/before work.	2.6	42
I enjoy spending time with my colleagues.	3.7	42
If I want to, I am able to meet more people outside of the work place.	3.1	42
I like to attend social events and interact with new people.	3.3	42
I know individuals from at least 20 other companies in my work area.	2.3	42
If I want to, I am able to exercise.	3.1	42

Table 5.2 illustrates the results of the Yes/No questions. In this part, 15 questions were asked about facilities, physical activity, social interaction and the environment. Below are the number of responses for each option and the total number of respondents who answered each question.

Table 5.2: Results Yes/No questions

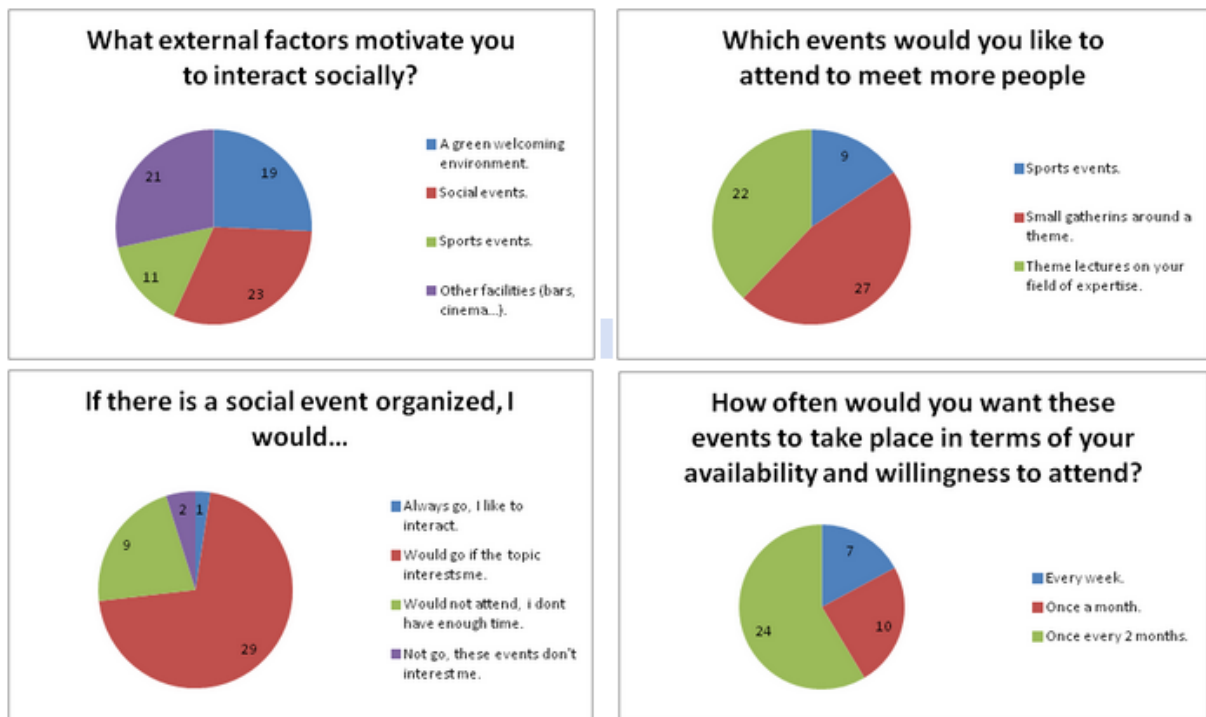
Question	Yes	No	N
Do you like the environment of the Science park Twente?	33	6	39
Do you walk a lot in the green environment of the Science park Twente?	7	32	39
Do you miss something in the environment of the Science park Twente?	19	20	39
Do you interact socially (like a walk outside/a nice chat/something else) with people inside your own company?	27	12	39
Do you interact socially (like a walk outside/a nice chat/something else) with people outside your own company?	14	25	39

Is the social aspect important for you in your everyday life?	36	3	39
Would you like to have more social contact with the surrounding company employees?	23	16	39
Do you think that the Science park should give more opportunities to create social interaction?	24	15	39
Would you like to social interact more with students?	21	18	39
Would you like to work more with students?	22	17	39
Do you feel like you are having enough physical activity?	20	19	39
Is physical activity something that is important for you?	32	7	39
Do you make use of the facilities of the science park Twente?	12	27	39
Do you think you know all the facilities you can use (like sports centre, cinema, other...) that are in the Science park Twente area?	17	22	39
Do you miss some facilities in the area?	18	21	39

By looking at the table 5.2, 4 questions stand out in terms of the number of responses for one of the given options (more than 29 respondents - 75% of the total number). Just like it was observed in the Likert Scale, most employees like the environment of the Science Park Twente. Furthermore, we see that physical activity and the social aspect is important for the employees and that most employees do not walk a lot in the green environment of the Science Park Twente.

Figure 1 shows the results of the close-ended, multiple answer questions. In this part, four questions were asked about social interaction. The figures below display the question and the answer division amongst the respondents. Looking at the question 'Which event would you like to attend to meet more people?', the answer 'Sport events' scores the lowest. Furthermore, if a social event would be organized, most employees would go if the topic interests them and would want these events to take place once every two months.

Figure 5.1: Results social interaction



This paragraph presents the most important results from the open questions. By looking at the answers that were given on the open questions about the environment you see that 'Good weather', 'A more green or nice environment', 'Having time' and 'Better routes or sidewalks' would encourage the employees more to walk in the green environment of the Science Park. The most important barrier to make use of the environment, for the group of employees who filled in the open questions, is 'Lack of time' (45% of the group employees). Other barriers that were mentioned are 'Distance' (too far away) and 'a difficult connection' (traffic/no route).

An opportunity to use the environment more would be 'Shared public spaces where you can meet and sit down or have lunch together.' This is also an aspect which they would like to see improved in the area and what they miss. Also a 'Less industrial looking area or more green space' is a point the group of employees miss in the environment and would like to see improved. Also 'Connect spaces between companies' is an answer that is mentioned more than once. One person mentioned 'Fitness space' as a missing facility in the environment.

The open questions that were about the facilities and physical exercise, shows that the main barrier to use the facilities and exercise physically is the 'Lack of time'. 5 of the 29 employees answer that they are 'not aware of the facilities' and 2 of the 29 employees answer they have 'low interest or do not see the added value'. About what would encourage them to exercise more in the facilities around the work area, the answers are various, but 'time' is still the most mentioned answer. Followed by 'Combined or organised activities' and 'Knowing where they are and how to use them'. What would encourage them to make more use of the facilities in general is again 'information of the facilities or possibilities' and 'time'.

A personal factor that would motivate to make use of the facilities more is 'to socialize'. If the group of employees have to name 5 facilities they use in the Science Park,

the most of them would know a restaurant, hotel, coffee corner or bar. 9 of the 25 employees name 'Cinestar' (cinema). The facility they miss the most are 'Better lunch options'. Opportunities to use the facilities more are 'Time', 'Providing for a divers supply of goods, services, exhibitions, events or place to meet', 'More green and interconnected routes', 'Creating more awareness about the facilities' and 'Connecting with co-workers of other companies'.

5.4 Focus group

Need for a common goal and lack of shared space

All of the interviewed parties agree that there should be an improvement in the environment of the Science Park. Some mention the potential that it offers, although all state that the current form of the Science Park is not inviting for people to spend their time there in their lunch breaks or after working hours.

From the business point of view, the settlement of many spin-off companies, the easy access to professors and the low threshold for communication makes the Science Park an attractive area to work in. Companies which are located within the university facilities are used to communicate with entrepreneurs.

However, it is argued that there is no open space to interact between the Science Park and the University. Part of the problem is the University being a closed unity, induced by Science Park's employees' misunderstanding that they are not allowed to make use of its facilities. This is illustrated by the statement of one of the focus group discussants: *"The university looks open, but it is a closed unity. The network is closed, the library is closed, the sport facilities are closed. There is no open mind, no open area."*

Furthermore, the information flow from the university to businesses is experienced as being scarce. Most of the participants agree that there is a wall, the divide of the Hengelosestraat which retains the Science Park from being a community where people are connected to one another.

From the student perspective, there is no or hardly any information provision on companies and how these companies might be of use to students and students to companies. Most of the students are not aware of the initiatives/tools of the University in order to support spin-off companies.

Regarding facilities, the focus group made clear that there are roughly three types of people: people who do not know that the facilities exist, people who know that they exist but who do not have the time or do not want to make time to use them, and people who know about events and facilities but who do not deem them interesting enough to make use of them. Facility issues were widely addressed and acknowledged within the focus group.

Usually, people are aware of the facilities that the Science Park has to offer. However, they feel that the facilities are not interesting for them, since a lot of employees commute to work every day and the lunch breaks are too short. They would rather leave the Park and go home to their personal life after work: *"It is your working spot, everybody is active with working. I'm not here to eat or to sport, but to work and that is what you can do quite good here."* They can also feel that they do not have enough time during the lunch breaks to go out into the Science Park and do something. Additionally, there is the group of people who do know about the events and facilities, but do not find them interesting enough to make use of them. Lastly, there is a group of people who are unaware of events and facilities.

In order to enhance the interaction between the university and the Science Park, one of the discussants mentions activities which are organized, such as 'Science meets busi-

ness' and monthly drink-hours. These are seen as opportunities to meet with others and to come up with collaboration possibilities, get to know each other and what people are doing.

The topic of creating a shared goal and become more of a unity as a Science Park (instead of every company just existing there on its own, working towards its own goals) was frequently mentioned by stakeholders: *"If there is a common goal, like a vision, why not just come out with it, big time, just promote it and try to adapt that vision to all of the groups."*

6. Discussion & Conclusion

In this section we derive conclusions of our results and discuss the findings. The research question and sub-questions are answered, the relation of this study with other studies is considered, theory is revisited and a look at the limitations of the current study is taken.

The three methods applied to the research (interviewing, literature review and focus group) lead to similar outcomes. Therefore, even though the study was limited in time and in terms of the amount of respondents, the fact that similar answers were repeated in the different methods suggests that there are some aspects which are worthy of looking into.

6.1 Answering the research questions

In this paragraph, the sub-questions will be answered according to the results of the research at hand, followed by an answer to the main research question.

1. What can be learned from other examples of multiple uses of space and social interaction in other Science Parks?

Benefits and limitations of the Science Park model were outlined in the literature. To enhance social interaction and health, research showed that a stimulating environment and a sense of community are important. Having a common goal is also suggested to stimulate social interaction. It is also found that companies could benefit of interacting and exchanging knowledge with other companies, including the University.

The literature research showed that although designers of Science Parks have high hopes for the social interaction and collaboration between companies in the area, this has proven to not always be the outcome. Individual companies often stay within their own boundaries, and do not favor social interaction with other firms. Regarding this finding, one could state that trying to achieve social interaction between companies in the Science Park Twente could prove to be overambitious.

2. To what extent do the employees experience functional and relational distance regarding social interaction and facilities in the Science Park?

According to observations in our research, several aspects represented barriers for the workers to not make use of the facilities. The main issues which were continuously put forward was the time issue as well as the distance problem: people feel that they do not have the time which is needed to participate in social interaction or make use of the facilities, and state that the distance between their work and the facilities is too large to actually make use of them in their small available time frame. Aside from that, the general feeling of disconnectedness from the environment because of the several reasons put forward in the results section (no green areas, no connecting routes etc.), contribut-

ed to the lack of physical interaction within the Science Park. Regarding social interaction, the main environmental barrier put forward was the lack of a common space.

The unattractive environment is the first barrier to be tackled. Despite it currently being an obstacle for social interaction, research showed that it could also be viewed as an opportunity: a lot of people stated that there are a lot of spots within the Science Park that have great potential to become attractive. Often-mentioned examples are the neglected lakes and benches. This means that there is a widespread feeling that the Science Park could become attractive, if some effort would be put into it. Another opportunity is more effective communication: this can contribute to the lack of facility usage and also make the events more known.

In order to get people to understand the activities which are organized, they need to be engaged more. Ways of doing this are, for instance, through working groups and internships. By doing this, it is possible to clarify what certain companies are doing, how to contribute to these businesses and get benefits out of it. Currently, students have ideas, but they do not know where to go. Therefore, which is emphasized in the discussion, students should be introduced more to the companies. Those who are motivated should be supported actively.

3. What is the opinion of the employees about opportunities and barriers regarding the existing social interaction and facilities in the Science Park?

Our research showed that a few employees currently do not use the existing facilities, because some employees do not know that the facilities exist and some employees know the facilities exist, but they do not have the time to use them or are not interested.

To tackle this barrier employees would like to have activities organized which involve several companies and which are designed to work together to a joined goal. They also spoke about an App which can give them information on the current activities which are held in facilities, so that they can be better informed. Furthermore, they would also like facilities and activities which are more fitted to their needs, since they have complicated schedules which sometimes make it impossible for them to attend, even though they would want to. These opinions proved to be very helpful in devising recommendations for action, which will be discussed in the final chapter.

Why do the employees in the Science Park area of Twente (not) make use of the existing facilities of the science park and what are reasons to (not) interact? Most of Science Park Twente's employees (69%) have shown to not make use of the facilities. This is because a lot of employees do not have a time schedule which allows other activities than work. This is also a reason for people not socially interacting: when there are not many people going outside of their own company for activities within the Science Park, they have less opportunities to interact socially. Another reason for the low amount of social interaction is that most employees do not know individuals of at least 20 other companies, and lack a certain shared goal to reach for. For these reasons, there exists an considerable functional and relational distance regarding social interaction and facilities in the Science Park.

6.2 Relation to other studies

When comparing the current study to other studies which were already conducted, several similarities can be found.

As stated by Lofsten and Lindelof (2001), it seems that the Science Park is an attractive location for businesses to settle. Most of the respondents like the idea of being in

a Science Park environment or proved to be happy in the environment they work in. This was also underlined by the Royal Haskoning report on Science Parks in the Netherlands which stated that "a large group of companies can be found (almost half) in the science parks that first and foremost attach importance to the allure of the Science Park and above all to its effect on their image" (p.) Bluntly put: companies want to settle in Science Parks not because of their willingness to interact with other companies, but more as a prestigious way to boost their image. In this sense, the lack of interaction observed in the results of the current report could also be linked to the fact that people want to make use of the Science Park for the image that it brings more than for the actual added value collaborating more could bring them. Although this link is speculative, this could explain the fact that the current interaction is so low.

The low interaction which is seen in the Science Park Twente is in line with another finding of the Royal Haskoning: in only one third of the cases there is collaboration between the researched companies. This finding was replicated in the current research, where the interviewees put forward in the focus group discussion and questionnaires that they did not interact a lot with people from other companies. A low degree of interaction is a finding which is also present in the research of Quintas, Wiel & Massy (1992)

It was put forward during the focus group that one of the reasons for the lack of collaboration might be the lack of a common goal. This insight can be linked to the findings provided by Chan and Law (2005), stating that the companies in the Hong Kong Science Park often did not collaborate because they felt they had little in common with one another. Therefore the suggestion of a common goal could be a potential incentive for the companies to collaborate more and, with it, to interact socially. These findings are in line with other studies: it was shown that having a sense of community is beneficial for interaction between different parties in an environment (Chavis & Wandersman, 1990).

In the open question part of the questionnaire, the fact that many interviewees responded that they were missing green routes or a more park-like structure indicates that it is important to have a pleasant outside surrounding which can also facilitate more physical movement and in turn possibly more interaction with the use of common outdoor spaces. This was suggested by Peters, Elands and Buijs (2010) who put forward that urban parks have been known to facilitate social cohesion by creating space for social interactions. However, even though the respondents stated they would want such an area, it is still yet to be if the implementation of such an area would truly create more interaction.

6.3 Revisiting theory

In theory, it was stressed that to create ultimate opportunities for social interaction and knowledge exchange, physical or functional and relational distance need to be taken into account (Nooteboom, 2006). What becomes apparent in this research, is that the barrier for interaction between employees of the Science Park and students of the University of Twente seems to be the physical or actual distance between them in terms of the divide of the Hengelosestraat. This which makes it hard for the two parties to meet each other. However, the relational distance between the two parties is small, since both parties are interested in each other's potential and express opportunities for collaborating and interacting.

Objectively speaking, a degree of cognitive conformity should also be present between different companies around the Science Park since these are all part of a system focused on innovation. Moreover, the physical or actual proximity provided to compa-

nies when located on a Science Park seems to provide opportunities and create space for social interaction in which different employees can meet each other and exchange ideas. Although parties stress the importance of being in a surrounding with companies that have the same interests, the same kind of clients and that produce the same products, they seem unaware of the fact that a potential client can be your next door neighbor.

The above mentioned text might be explained by the lack of a sense of community within the Science Park. In theory is stated that creating a sense of community amongst the employees on the science park and the students can lead to community participation and development (McMillan and Chavis, 1986). In this study, it becomes apparent that there is no shared goal or vision that is clear to all companies within the Science Park. This indicates that there does not obviously exist a sense of community in which shared needs are met. Although, executing meaningful work is a shared desire by all parties, most of them are not aware of what they can do for each other, which creates emotional and physical distance.

The inadequate use of facilities and attendance of events around the Park, which is suspected to originate from a communication problem, can be addressed to a lack of relational proximity between the municipality, the Science Park management and the employees. Since a lot of companies are hard to reach, there seems to exist a misunderstanding and therefore a low degree of cognitive conformity on how to approach those companies.

Furthermore, a cognitive mismatch comes forward in terms of different expectations regarding the facilities. Whereas the Science Park management wishes to increase the use of facilities, other parties argue that employees are busy doing their job and are not interested in using facilities around the Park most of the time. One of the reasons for this, is the distance between the facilities and the companies, which is subject to time constraints. Therefore, in terms of empowerment, this study reveals that the Science Park has a restricted capacity or potential to encourage social interaction between different actors in order to achieve positive health outcomes.

6.4 Limitations of this study

There are several limitations to both the design and the execution of this study. In both, time plays an overarching role.

While designing the questionnaire, the choice was made to develop it in English. This was at the time evaluated as easier since not all the researchers in the team are Dutch, but also for the purpose of not having to translate all of the information back and forth during the research. The latter would save a lot of time: a resource which was scarce because of the relatively short research period of six weeks. However, a lot of feedback received on the questionnaire was not positive about it being in English. This could have formed a possible barrier for the respondents, because most of the employees of the Science Park are in fact Dutch. Therefore, the language barrier might have caused the low response rate which we had to deal with: only 42 questionnaires were (partially) filled in. With a ‘population’ of roughly 4000 employees, this outcome might not be very statistically relevant.

Another possible explanation for the low response rate can be found in the distribution of the questionnaires. Originally, the approach was envisioned to send it to every employee individually. Unfortunately, this could not be realised due to privacy reasons: the companies and the commissioner were not allowed to distribute them because this was regarded as an infringement of privacy. Therefore, the questionnaire was sent to the common e-mail address of the companies with the request to forward them

to employees. However, as noted before in this report, it is a possibility that because of the large amounts of emails received daily by the companies, that some of them were not forwarded.

It is assumed that for both of these reasons, there was also a low response rate to the request of participation in the focus group. Only people who have read the email which requested the filling in of the questionnaire have read the request for participation in the focus group. It is believed that there is an even higher barrier to reserve time to go to a gathering and meet unknown people, than there is to anonymously fill out a questionnaire. The low probability of seeing the request, the barrier to actually come over, the short notice on which the request was sent (again a limitation of time) and the barrier of language all pose explanations as to why there were only four people present at the focus group gathering.

Another internal limitation of this study is the lack of inclusion of visitors and students in the research. The interview with the commissioner showed that there was also a need for research on the motivations of them to interact within the Park. However, again due to lack of time, it was necessary to narrow down the research to ensure quality of the work that is in fact done. Therefore, the choice was actively made to exclude visitors and students from the research.

Regarding the limitations of our study, it is also important to look at the results and methodology for questions or information that can cause bias. Since the conclusions in this report are made on the basis of results from the research, it is wise to critically look at this research. In our questionnaire there were some double questions:

- *'In general, I think I have enough time to work out or go to the gym after/before work'* (Likert scale). We could have split this question to know if they have time before work, but not after or the other way around.

- *'I like to attend social events and interact with new people'* (Likert Scale). Maybe the employees like to attend social events, but not like to interact with new people.

Regarding the statement *'I know individuals from at least 20 other companies'* this is more a Yes/No question than a statement for the Likert Scale. Additionally, there was a question which was not concrete: *'Do you walk a lot in the green environment of the Science Park'*. What is 'a lot'? Had there been more time to formulate the questions for the questionnaire, more attention would have been paid to prevent these mistakes. However, due to strict deadlines, unfortunately a few of these rigged questions were not noticed before sending out the questionnaires.

By looking at the answers the employees have given on the open questions, some employees repeated an answer consistently. When looking at the research results, one notice contradictions. One of these contradictions is that the commissioner stated that a lot of employees have complained about the environment, but when looking at the results of the questionnaires, the employees appear to be happy with the environment that they work in. A possible explanation for this phenomenon is selection bias: the people that ultimately responded to the request to fill in the questionnaire might not be representative for the entirety of the 'population' of employees of the Science Park Twente. A danger of this bias is that it also affects other aspects of the research, but is less noticeable in these cases than it is with this example.

7. Recommendations

This final chapter will suggest actions which can be taken to address the three main issues put forward in the problem analysis: social interaction, use of facilities and envi-

ronment appreciation. There are two kinds of recommendations that are made in this final section. First, recommendations for practice are made. These will help the commissioner decide upon further steps to possibly improve the situation in the Science Park Twente. Secondly, advice for further research is given. Part of these recommendations are based on the responses of the stakeholders from the focus groups, interviews and questionnaires, and part of the recommendations is based on literature concerning the topics: what aspects still need some improvement according to other research made? Due to the short time frame that was available for the current research, there is still a lot to explore.

7.1 Increase common projects - the policy scope

Changes in policies are made to go beyond the individual level and promote a more coordinated framework for group action. They take into context a more top-bottom approach to provoke change instead of waiting solely on the workers to individually engage in more social interaction. In this sense, a universal Science Park policy which could unite the companies could in turn create a positive outcome on the organizational micro-level.

By taking the Center TRT approach as a base for policy analysis, it becomes apparent that in order to set up a good policy, the first step is to analyze the inputs, namely problems, solutions to those problems, and politics. In this case, one of the main issues which stands out as a result of the current research is that no common goal seems to be observed in between all the companies which feel disconnected from one another on a geographical, but also social scope. This is embodied in the setting of the Park itself, through the disconnectedness of the buildings, lack of common space linking the workers together outside of their individual workplaces and the lack of nice green areas which could foster more interaction. Therefore, to remedy this issue, a general company policy for all the firms settling in the park could be set up. The main stakeholders would need to be involved in this process, including the Science Park Twente management, who would need to make sure these policies are implemented on a global scale. Additionally, all the individual company managements would also need to agree upon setting up such an intervention.

An aspect could be to create a framework to which all of the companies would contribute to such as a common room. In this space, employees could lead projects together but also interact in a common social area. This could include a lunch space, a pleasant open section outside and a general multi functional room.

As suggested during the in-depth interview with the Raedhuys representative, an activity which could be implemented is to set up a common activity such as tree planting where the employees could engage themselves in enhancing their surroundings. This would empower them to affect the determinants of their environment and would also enable social bonding in between the companies through the interaction during the activity. Such an event could for instance happen every two months as the majority of respondents indicated in our questionnaire that this is the frequency they would like to attend events.

In conclusion, common activities need to be put together whilst taking into account the limitation of employees (time, distance) and adapting it to what they would like to attend (ie. things which interest them and could generate possible networking). In this sense, the activities could take place for 1 or 2 hours for example during their morning work hours so that it doesn't interfere with them coming home in the evening.

The individual companies would all need to accept such an activity and include it in their policy so that all the employees participate.

7.2 Increase social interaction

One of the main issues that came out of the research is the lack of social interaction between those working at the Science Park and students. During exchanges of knowledge and information between actors, conditions are created for new innovations and to learn innovations from those nearby. This may lead to higher levels of productivity (Lee & Rodriguez-Pose, 2012). Therefore having more opportunities for interaction would be positive outcomes.

The notion of the importance of a 'shared goal' was a recurring topic in the focus group and interviews. Interviewees suggested that a fair share of employees is not interested in interacting plainly for the sake of developing friendships: they want to attain personal goals or develop business-related relationships. When the Science Park organizes activities which have an individual and joint advantages for all parties involved, people would be more enthusiastic to participate and more encouraged to establish social connections (be it professional or personal). One employee representative provided a concrete example of this: planting trees as a joint event. This is a fun, physical activity to do, people can easily interact, and there is a higher purpose in the sense of creating a more green environment in the Science Park. Additionally, it also enhances the sense of community. Therefore, the alliance between fun and networking could prove to be a successful combination.

7.3 Increase the use of facilities

As mentioned before, employees of the Science Park (and students) are able to learn from one another through formal and informal meetings. These gatherings of different people from different disciplines inspire, encourage and lead to research creativity. Certain facilities in an area, such as a restaurant, bar or congress center, invite people to get together and socialize in an informal way (Vrije Universiteit, 2010). Besides, open innovation starts with informal interaction. Physical proximity encourages this contact (Buck Consultants International, 2012).

According to this research, there were roughly three categories in which an employee could potentially fit, regarding the issue of facilities and events: people who do not know about the facilities, people who know about them but who want to do other things with their time outside of work, and potentially people who know about the events but who might not be interested in participating or who haven't found any events that interest them yet amongst the ones proposed.

The first category, people who do not know about the facilities, have to be approached more and more specifically about what is going on at the science park. During the focus group, somebody mentioned that there is a 'Twente App', with news about Twente and possibilities for networking. This is a step in the right direction, although the focus group and also the employee interviewed argued that there should be a specific app for the Science Park. This way, people could easily see what the new developments are on the topic of events. Another way of keeping people informed would be the possibility to subscribe to a newsletter, which comes out weekly and lets everyone know what is happening in (and around) the science park.

There are also people who know about the events, but want to do other things with their free time. Therefore there is a need to segment and target specific groups.

The people who would know about the events but potentially don't find them particularly interesting can be asked to provide information on their interests. This way, (new) facilities and events can be tailored to them more effectively, and can cause inclusion of this group of people into the Science Park community as well.

7.4 Increase the appreciation of the environment

Among the people who were interviewed (in in-depth interviews and in focus groups alike), there was a shared sentiment regarding the environment in the Science Park. As a stakeholder put it, "it is not yet a nice place to stay during lunch time, and it is not a representative place for companies". As stated in the 'results' chapter, the municipality struggles to establish contact with companies. This is needed to make them aware of the possibilities that the environment of the Science Park has to offer in terms of events. Since this means that there is a fundamental communicative problem on this topic which establishes the issue, communication between companies can prove to be the key to the solution as well.

One factor which is mentioned throughout our research which could be a main culprit in this communication issue, is the fact that a lot of companies have an e-mail address on which they can be contacted for general outside causes. Since employees seem to be overloaded with e-mails, alternative ways to reach them could be having a central event person in each company for instance who could publicize the events.

7.5 Recommendations for research

One of the main recommendations for research would be to further see how the physical environment could be built up in order to promote more social interaction. This stands more on the line of urban planning or workplace design. The current research showed the importance to the employees of an attractive environment, which could be an incentive to design the environment more to the people's needs and wants.

Additionally, it would be useful to replicate this research with more employees so that the study has higher external validity, but also to confirm the results found during the current research. When designing a new research, the points of critique which are mentioned in the discussion of this report should be taken into account. When researchers are aware of the possible pitfalls that can be encountered during research, they can design their own research to work around them and avoid making the same mistakes.

There is also research needed on an appropriate shared goal. Although it was mentioned and requested a lot during the data collection for this report, only few substantial suggestions as to what it should be exactly were made. When there is insight in what common goal would cater to people's needs, it can be more effective than when it is not based on theory.

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Appendix

I Questionnaires

1. From a level from 1 to 5 when 1 is not true and 5 is very true, please evaluate the following statements:

- I am happy with the environment I work in.
- I think there are enough activities in the area I work in.
- I think the Science Park Twente is an attractive area to work in.
- In general, I think I have enough time to work out or go to the gym after/before work.
- I enjoy spending time with my colleagues.
- If I want to, I am able to meet more people outside of the work place.
- I like to attend social events and interact with new people.
- I know individuals from at least 20 other companies in my work area.
- If I want to, I am able to exercise.

2. Answer the questions with yes/no. If you want to add/say/note something regarding to your answers, please do in the comments area.

- Do you like the environment of the Science park Twente?
- Do you walk a lot in the green environment of the Science park Twente?
- Do you miss something in the environment of the Science park Twente?
- Do you interact socially (like a walk outside/a nice chat/something else) with people inside your own company?
- Do you interact socially (like a walk outside/a nice chat/something else) with people outside your own company?
- Is the social aspect important for you in your everyday life?
- Would you like to have more social contact with the surrounding company employees?
- Do you think that the Science park should give more opportunities to create social interaction?
- Would you like to social interact more with students?
- Would you like to work more with students?
- Do you feel like you are having enough physical activity?
- Is physical activity something that is important for you?
- Do you make use of the facilities of the science park Twente?
- Do you think you know all the facilities you can use (like sports centre, cinema, other...) that are in the Science park Twente area?
- Do you miss some facilities in the area?

3. What external factors motivate you to interact socially?

- A green welcoming environment
- Social events
- Sport events
- Other facilities (bars, cinemas..).

4. Which events would you like to attend to meet more people?

- Sports events
- Small gatherings around a theme
- Theme lectures on your field of expertise.

5. How often would you want these events to take place in terms of your availability and willingness to attend?

- Every week
- Once a month
- Once every two months

6. If there is a social event organized, I would...

- Always go, I like to interact.
- Would go if the topic interests me
- Would not attend, I don't have enough time.
- Not go because these events don't interest me.

7. Open questions:

- What would encourage you to walk in the green environment of the Science park more?
- What barriers hinder you to make use of the environment?
- Which opportunities do you see to use the environment more?
- Which aspects would you like to see improved in the area you work in?
- If you miss something in the environment, what do you miss?
- What are the main barriers for you to exercise?
- What would encourage you to exercise more in the facilities around your work area?
- Name 5 facilities you use in the Science Park area:
- Do you miss some facilities, if your answer is yes please note which facilities you miss?
- What personal factors motivate you to make use of the facilities?
- What barriers prevent you from using the facilities?
- What would encourage you to make more use of the facilities in the Science park more?
- Which opportunities do you see to use the facilities more?
- If you have any comments/notes/something to say about Facilities, Social interaction, the Environment of the Science park Twente area or the Science park Twente in general, please do so
- If you have any comments/notes/something to say about the questionnaire, please do so

II Results questionnaires

What would encourage you to walk in the green environment of the Science park more?

Category	Number of employees (N=33)
No Answer/?/Nothing.	9
(Good) weather.	8
More green/Nice environment	5
Time.	4
More space connection between companies/routes (better side-walks).	3
Other people asking to walk.	1
If our company building would be near by the Science Park.	1
If it is known that there are events nearby	1
That there are also non-working people walking around, so not on a separate industry or knowledge park.	1

What barriers hinder you to make use of the environment?

Category	Number of employees (N=33)
No Answer/?/None	7
(Lack of) time	15
Distance (too far away)	4
Difficult connection (traffic/no route)	3
Weather.	1
Lack of shops.	1
A lot of parking places instead of green field	1
See above	1

Which opportunities do you see to use the environment more?

Category	Number of employees (N=31)
No Answer/?/None	18

Shared public spaces where you can meet and sit down/have lunch together.	3
Weather	2
More time/better time management.	2
One park like structure and the spaces in between that connect/ Better walking paths.	2
Create services that are relevant for employees (restaurants, shops).	1
Open-air lectures. Ancient Greece agora-style setting.	1
Active promotion.	1
Move our company building	1

Which aspects would you like to see improved in the area you work in?

Category	Number of employees (N=32)
No Answer/?/None/it's okay	16
More shops and restaurants/lunch opportunities (a small kiosk/technical shop...)	5
Less industrial looking area/more green space	3
More interaction with other companies	2
More connecting routes	1
Active promotion	1
High tech image	1
Upgrade of offices	1
More centered	1
Too much to tell	1

If you miss something in the environment, what do you miss?

Category	Number of employees (N=30)
No Answer/?/Nothing	14
Place to have lunch (for reasonable price)/Better common space (terrace)	7

Improved outdoor space/park-like green environment (trees, flowers...)	4
Connect spaces between companies	2
Active promotion	1
Fitness space	1
See above	1

What are the main barriers for you to exercise?

Category	Number of employees (N=29)
No Answer/?/None	9
(Lack of) Time	16
Opening hours of my own gym	1
Possibility to follow the lessons of RPM.	1
Weight	1
I do not have integrated it in my patterns	1

What would encourage you to exercise more in the facilities around your work area?

Category	Number of employees (N=27)
No Answer/?/Nothing	12
Time/Flexible options	3
Combined/organized activities	2
Knowing where they are and how to use them	2
People joining me	1
More green and interconnected routes	1
Discounts	1
Weather	1
Early opening hours	1
I do it in the evening, close to home	1
During working hours	1
Possibility to follow the lessons of RPM.	1

Name 5 facilities you use in the Science park area (More categories possible):

Category	Number of employees (N=25).
No Answer/?/None	13
Restaurant/hotel/Coffee corner/bars (Broeierd, Sensazia, The Lunchbox, UT Waayer, Catering KvK)	12
Cinestar (cinema)	9
Fitness centre	3
FC Twente	2
Karting	1
Diving world	1
Bowling	1
University	1
Train station	1
Meeting room	1
Ice rink	1
Several	1

Do you miss some facilities, if your answer is yes please note which facilities you miss?

Category	Number of employees (N=28)
No Answer/?/No	17
Better lunch options (cheaper restaurant/terraces)	7
Physiotherapist/training area	2
More green and interconnected routes	1
Yes, same as mentioned before	1

What personal factors motivate you to make use of the facilities?

Category	Number of employees (N=29)
No Answer/?/None	16

Socialize	4
Hunger/thirst	3
Quality/cost/flexibility relation	2
Health	2
Hobbies	1
Close by	1
Time	1

What barriers prevent you from using the facilities?

Category	Number of employees (N=29)
No Answer/?/None	12
(Lack of)Time	8
Not aware of the facilities	5
Added value is low/ interest	2
More green and interconnected routes	1
Too far from home and expensive	1

What would encourage you to make more use of the facilities in the Science park more?

Category	Number of employees (N= 26)
No Answer/?/Nothing	13
Information on facilities/knowledge of the possibilities	5
Time	3
People asking me to join them	1
More green/interconnected routes	1
Shorter distances	1
Cheaper traffic	1
Synergy	1
Availability	1

Which opportunities do you see to use the facilities more?

Category	Number of employees (N=26)
No Answer/?/None	17
Time/Improved time management	3
Provide for a diverse supply of goods, services, exhibitions, events, place to meet, etc.	2
More green and interconnected routes	1
Create more awareness about the facilities	1
Connecting with co-workers other companies	1
A lot	1

III Swot analysis

Strengths

- Try to hold the students of the University of Twente in the municipality.
- Try to attract more companies and people that want to settle down in the area.
- Attractive route by car from the South to come to the Science Park area.
- The municipality is working on the lacking parts together with partners (attractiveness, networking, accessibility of the Science Park).
- There are a lot of facilities at the Science Park to do teambuilding activities; karting, the skating rink, Go Planet, Cinestars...
- The events that they have in the area now are: a big congress once a year, lunch, all kinds of lectures, readings about innovation, drinks once a month (dutch: 'borrel') and a sports game once a year for companies (at the University).

Weaknesses

- Science Park is not a nice place to stay in lunchtime or have a walk.
- Now it is a high tech area with a lot of offices (not representative for companies).
- There were some nice spots in the Science Park area, but they are neglected. For example there is a nice lake, but it is overgrown with reeds.
- If you come to the Science Park by North you will not ride an attractive route.
- One interviewee thinks there is lack of business, because they're on the old route.
- The employee goes to the bakery in the city for a nice sandwich, but not to the communal canteen in the Science Park itself. For example 'the Waaier' at the University of Twente is too busy, you have to wait there very long (15 minutes) and there is not much space to look into a newspaper or something else.
- There are some bars, but not a place where you can sit nicely. Cinestar (cinema) is not cosy, so she meets in the city.

- There are no bikes for rent in the Science Park area to cycle through the area.
- Miss some facilities, for example childcare and small shops.
- The employee mentions that the employees like to go home after work instead of using the facilities. A cinema is very nice for a neighbourhood activity, but not during office times.
- Lack of awareness of events/facilities.
- The municipality does not know how to reach the companies.

Opportunities

About the opportunities the interviewees came up with a lot of ideas:

- Connect companies that sell the same products.
- Use other companies qualities to make the Science park better.
- Think of activities during work than after work. More on the business aspect (networking), than on the leisure aspect. For example a 'Tree planting day' with other companies of the Science Park to make the environment look greener.
- Create picnic areas or tables, little fountains, a place where you can drink just a nice cup of coffee, a trendy place where you can sit.
- There is a Twente App, The employee also would like a Science Park App. But still this is more like a digital way of meeting and not a personal way.
- Idea of a digital newsletter: Every employee that is a member of this newsletter is already signed in to come to events and that they have to sign out if they don't want to participate. They are involved than more actively.

Other opportunities are:

- In some companies an employee has 40 work hours to support social causes.
- The employee mentions that she like the way meetings are organised at the Rotery Club: half hour meeting, half hour lunch and half hour a theme to present. The Rotery club is at a fixed time and day. They have an active secretary that sends out a reminder before the organised date (so more people can come).
- Relation with the University is to arrange internships for students. For example now there is an internee that is busy on a project about urban planning.
- When there is a football game at the FC Twente Stadium. 35.000 supporters come through the area and can make use of the facilities.
- There is also mentioned during the interviews that there is room for new concepts in the area and that the opportunities are on the site of the hospitality industry and programming.

Threats

- Economic and education degree of the population of Enschede is below average.
- Nearby the Science Park you have the FC Twente Stadium. When there is a game, 35.000 supporters come through the Science Park area. This can cause damage to the environment.
- There are not registered companies in the Science Park area.
- Work pressure or hectic time for companies.
- The employee mentions that telephonists and service desk people are time-bounded (are not free to fill in their own agenda).

IV Additional background information Science Park Twente

Context

The process and the output contribute to:

- Living and working in rural & science setting. Multiple land areas of the Science park, divided in: 'Campus-study', 'B&S park = work', 'Twente Village = sport and leisure', encourage physically and programmatically more to connect and utilize each other's qualities and strengthen.
- Green-blue veining
 - Make a connection between the green and blue structures of the Campus and Kristelbad allowing that a more compact and attractive field is created for recreation and nature.
 - Nutrition and health
 - Attractive green environment with many sporting facilities invites students, workers, citizens and visitors to active exercise in open air.

About Science Park Twente:

'Science Park Twente is designed to put science to work. With Science Park, the University of Twente (UT), the province of Overijssel and the municipality of Enschede (representing the Network City) aim to further develop the area into a knowledge-intensive region of international stature by promoting activity through the generation and transfer of knowledge. Science Park invites initiatives that put science to work and focus on the link between science and industry. Generating no tangible products of its own, Science Park instead enhances the ability of others to do so' (www.sciencepark.nl).

About the project

The station Drienerlo is for the Science Park and the University of Twente an important feature. Staff, students and many visitors use this station a lot to come to the Science Park area. In 2011, a study of the spatial quality of the Science Park area was conducted by 'the Oversticht'. In this study is revealed that there are insufficient facilities for pedestrians and cyclists. It is also noted that the axis of the drive Drienerlo to the heart of the campus is not utilized.

The same signals come from the entrepreneurs. From conversations with individual entrepreneurs of representative organizations they found out that:

- There are insufficient opportunities in the afternoon to walk through the area.
- There are insufficient facilities within the meaning of hospitality.
- The route from the station to the companies and the University Twente is unclear and hard to find for strangers.
- The appearance that the area has now is not (yet) connected to the high-tech environment that matches the profile of the Science Park Twente.
- The lack of awareness, especially employees, of all the activities that take place in the area.
- The residence factor of the area should continue to be provided.
- There are a number of places in the Science Park area where there is a lot of parking pressure.

To improve the aspects that are mentioned above, there has been made a plan to realize slow traffic from the axis from the station Drienerlo to the education and research campus. Along this axis, companies and facilities are realized and thus the living environment will be

improved significantly and also the use of public transport stimulated. This plan is illustrated beneath:



Figure 1: Slow traffic route plan at Science Park Twente.

Improving the business climate

Science Park Twente attracts workers, entrepreneurs and students from across Twente and (far) outside Twente. Also international companies are increasingly showing interest to open a Research & Development department in the Science Park area. As indicated above, there is a lack of attractiveness of the area. To increase the attractiveness of the area even further for innovative high tech companies besides a good accessibility, which is essential for all businesses, some things can be improved. These include:

- The living environment.
- The attractiveness of the area for slow traffic.
- Connecting the area to the station, especially after completion of the new station and the provision of adequate facilities in the broadest sense of the word.

Also innovative ways to activities in the area to share with employees, students and visitors contribute to the residential quality of the area and the economic capacity of the facilities in the area. Important for companies and employees in the area is that they know how to find each other. This will create more and better business contacts and more use of the facilities which thereby gain a wider economic base.

With ‘Novay’ there will be a concept elaborated in which both the reference feature for visitors of companies and facilities in the area and the University will adequately be controlled, just like the alerts at events and meetings in the area. For this last feature there will be collaborated with ‘Powered by Twente’, the organization that organizes the events in the area. There will be also a collaboration with facilities such as the sports complex at the University of Twente and Twente Village, catering establishments, Wolf Cinestar, the hall and of course FC Twente .

This digital reference and information must match the high tech look of the area and manifest themselves at the station and the O & O – Square (Dutch: Onderzoek & Onderwijs plein, English: Research & Education square) and the connecting there between. We also want these channels provide information on major projects in this area, such as the sustainability performance that are delivered.

It is also important to make the area of the Science Park attractive for walking and cycling employees:

- To walk on an more attractive lunchroute.

- To reach the various facilities earlier.

This accessibility extends the time of the employees in the area, and there will be a greater support for the facilities. This requires the hiking and cycling routes in the area constructed and connected and there must be built cycling and walking bridges over the ponds.

Implementation of this project covers all these aspects, but first there must be an investigation on a number of components whether this is actually feasible and if so in what way they can best be implemented.

It also fits the rebranding of the station Enschede Drienerlo. It is proposed to request the NS (Dutch railways) to change the name in Enschede Science Park and the cost thereof to be included in this project.

Environmental quality and sustainability

The setting of the axis makes an important contribution to the spatial quality of the Science Park. Adding more green, a connection to existing structures of the park of the University Twente, reducing the number of cars on the ground level and construct in its place more green, may strengthen the spatial quality. This is also in line with the recommendations that 'Oversticht' made in 2011. To connect the area more with the station and make it more attractive to cyclists and pedestrians, the use of public transport and bicycle use will be encouraged. This contributes to the sustainability of the area.

To emphasize the high tech look of the area, the Science Park will use the most innovative techniques and materials, and according to the most sustainable principles for the infrastructure. Think of UT (University of Twente) inventions in the field of sound absorption and energy production using asphalt, luminance related to attendance, smart grid and solar energy. Where possible, it will be realized with the entrepreneurs of the Science Park: this creates a demonstration park for entrepreneurs and science in a high tech innovation campus with an international reputation and a user-friendly living environment.

Planning:

There is a planning to realize the project as described above.

Phase 1: 2013, till possibly 2014 - Research feasibility of the garage, research capabilities and ways to exchange innovative digital information in public space, preparation and implementation of parts of the axis that can be performed without hindrance. Realization of free WiFi.

Phase 2: End of 2013 – Decision making about garage and innovative digital information exchange.

2014: - Depending on the decision, realizing innovative digital information exchange in public domain.

2015-2016: Depending on the decision, preparation and realization garage.

Financing:

The cost of the project can be divided into 2 parts. Namely the costs in 2013 and possibly of 2014 and the costs, especially for the garage whose center of gravity is expected, in 2015 (depending on the decision). The total costs of the total project will be €3.100.000,00. The cost of parking and any decision thereon can't be estimated, because it depends on the location and other factors.

Risks

A number of items are not yet well developed and the costs are very overall estimated. Because there is also 10% contingency included, it's expected that there is enough budget to implement measures. As far as now can be estimated, there are no legal obstacles to the im-

plementation of these measures. It fits within the current zoning and also within the proposed revision these measures are possible.