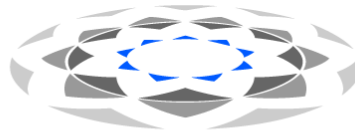


PHILIPS

MiPlaza



**Research on the role of
MiPlaza within the
Open Innovation R&D community**

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PUBLIC VERSION



University of Twente
Enschede - The Netherlands

Research on the role of MiPlaza within the Open Innovation R&D community

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Abstract

MiPlaza, the cleanroom facilities of Philips Research Eindhoven, wants to commercialize its facilities and services in the R&D community evolving in the Eindhoven region based on the concept of Open Innovation.

The central idea behind Open Innovation is that companies cannot afford anymore to rely entirely on their own research, but should buy or license processes or inventions from other companies as well. In addition, internal inventions not being used in a firm's business should be taken outside the company, by for example licensing, joint ventures or spin-offs.

As one of the steps of implementing this concept, Philips Research in Eindhoven opened its cleanroom facilities to third parties to allow for Open Innovation to develop. MiPlaza was created to operate and commercialize those cleanroom facilities. When operating in an Open Innovation community it is important as organization to have the proper identity, therefore MiPlaza needs to be rather clear where the organization stands. The questions of who MiPlaza exactly wants to be, and what it's mission and identity are, are not only important with regard to its customers and partners, but with regard to the internal organization as well. So, the role MiPlaza needs to take in the Open Innovation R&D community needed to be defined.

To be able to define the role of MiPlaza, the research had been split in two parts, a stakeholder analysis which identified the desired roles and the issues and barriers of implementing and performing those roles as experienced by the stakeholders, and a comparative study which identified the roles of similar organizations and the way those organizations deal with the issues and barriers identified by MiPlaza's stakeholders.

The roles MiPlaza's stakeholders desired MiPlaza to perform, were found to be the facilitator role (for both R&D, as well as small-batch production), which provides the facilities and lets its clients do their own things; the knowledge center role, which collects and provides access to knowledge, information and ideas; and the technical professional services provider role, which creates value for its customers by applying professional knowledge in a specific field of interest. The last role includes the roles of engineering office, test center and analytical research center.

Roles MiPlaza should not perform, were found to be the program institution role, which coordinates specific programs in which the innovation network participants can cooperate to create a new product or technology together; and the center of excellence role, which facilitates development of products by supporting (key) functions and operations using its special knowledge or expertise. Those roles would turn MiPlaza into a competitor of several of its biggest customers.

There was also a strong demand for the role of non-technical professional services provider. However MiPlaza does not need to perform the professional services provider roles itself, it could serve those demands by performing the connector role, where MiPlaza can make connections between its customers and organizations that can provide the help those customers need for their innovations.

The main issues raised by the stakeholders were lack of a clear identity, intellectual properties and confidentiality issues, prices (too) high, the legal identity, no clear cost structure, and too much 'research'-attitude.

Four organizations were studied for comparison, two university labs and two commercial labs. All four performed the facilitator role, for R&D as well as small-batches, and they all functioned as a knowledge center as well. Non-technical professional services were only provided by two labs, one university and one commercial lab, either by themselves or through their connector role. It was found that the more commercially oriented a lab is, the more it should promote its own identity, and the more it should embrace and support intellectual property rights.

To conclude, the roles that MiPlaza should perform within the Open Innovation R&D community in the Eindhoven region are facilitator (both for R&D as well as small-batches), knowledge center and connector. MiPlaza should be a separate legal entity and promote clearly and solely its own identity, as well as provide obligatory legal training for all employees regarding intellectual property and confidentiality.

Acknowledgements

This report is written as a result of my graduate assignment. I am studying Business Administration at the Twente University in Enschede and I hope to conclude this Master of Science study with my graduate project described in this report, in which several people were of assistance. Therefore, I would like to thank all people who contributed to this research.

Special thanks to my supervisor of MiPlaza, Gerjan van de Walle, and my supervisors of the university, Klaasjan Visscher and Patrick Blik.

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Casper Doppen
Eindhoven, September 2008

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1. Introduction

Ever since the concept was introduced in 2001 by Henry Chesbrough, Open Innovation has been a hot topic worldwide. Several organizations, as well as complete innovation networks, started implementing the concept. However, for some organizations the role to play in a business network based on Open Innovation is not always immediately clear and some unexpected issues might be encountered.

Also Royal Dutch Philips started implementing the concept of Open Innovation. One of the steps was opening up their research and development campus in Eindhoven, the Netherlands, creating the High Tech Campus. Another step was offering the cleanroom facilities of Philips Research at the campus to third parties. Therefore MiPlaza was created, which is to operate and commercialize the cleanroom facilities in way to support Open Innovation activities.

In this report the research is described which tries to define the role MiPlaza should play in the Open Innovation business network and to address issues that are or might be encountered while performing this role.

First, a description will be provided about the company, starting with the top level of the mother organization, then going down in the departments and divisions structure to MiPlaza itself. Thereafter, the research design is presented, which discusses the research goal, central question, research questions and research approach. Next the theoretical framework is presented, which will be the base for the actual research. Then the actual research is described, split in a stakeholder analyses and a comparative study, which will finally lead to the conclusions and recommendations.

Since this is the public version of the report, for confidentiality reasons the names of some organizations have been concealed as well as some details in the research have been removed.

2. The Company

In this chapter a brief general description of the company will be presented. Details relevant to this report are discussed in the next chapters.

First, Royal Philips Electronics N.V. will be described, after which one department, Philips Research, is looked at in some more detail. Then attention is focused at Philips Research Eindhoven, and a specific part Operations and Engineering. Finally a brief introduction will be presented about MiPlaza.

2.1 Philips N.V.

Royal Philips Electronics of the Netherlands is one of the world's biggest electronics companies, as well as the largest in Europe, with 160,900 employees in over 60 countries and sales in 2004 of Euro 30.3 billion.

Active in over 60 businesses, and with more than 115,000 registered patents, Philips is currently number 1 in the global markets for lighting, electric shavers and DVD recorders, and number 2 in medical diagnostic imaging worldwide. Within the cyclical goods market, Dow Jones recently ranked Philips the global leader in sustainability.

Royal Philips Electronics focuses on three main fields and has five product divisions (PD's).

The focus fields are:

- Healthcare
- Lifestyle
- Technology.

The divisions are:

- Medical Systems
- Domestic Appliances
- Consumer Electronics
- Lighting
- Semiconductors

The focus fields overlap each other to some extent, as well as some PD's are in multiple focus fields, as shown in figure 2.1.

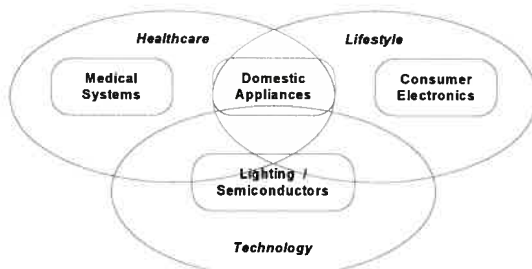


Figure 2.1: Focus fields and PD's

Next to the product divisions there are Regional departments, Other Businesses, Corporate Staff & Services, and Research (figure 2.2).

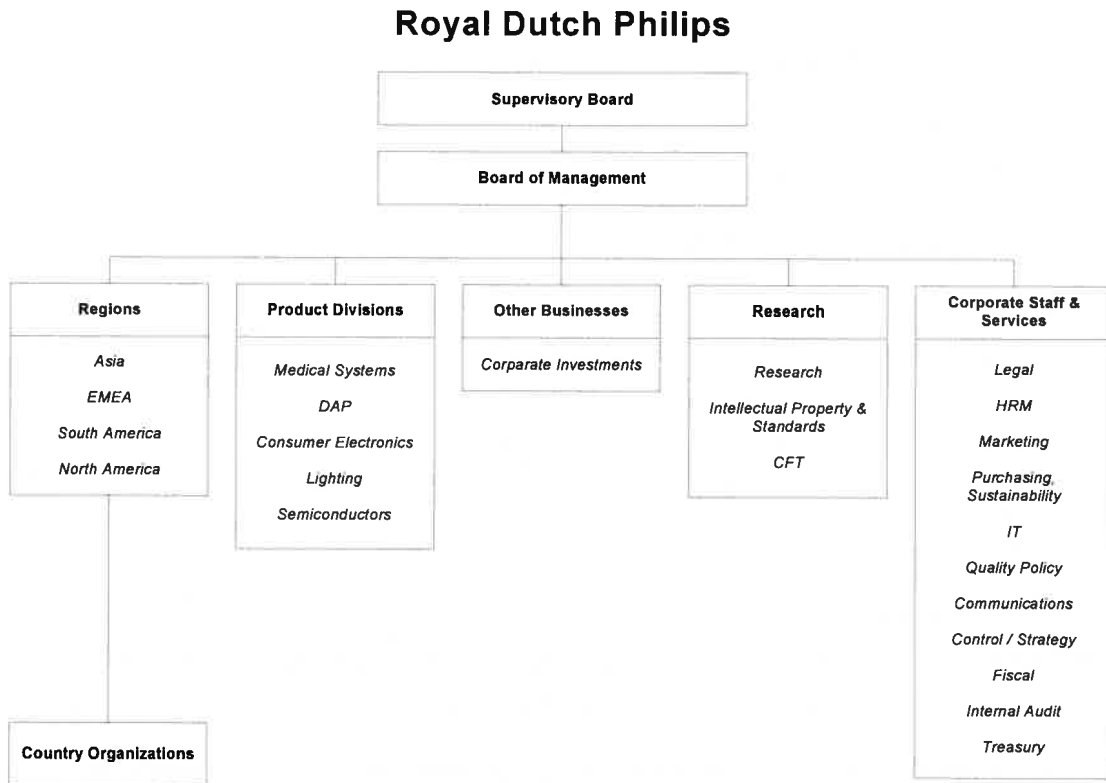


Figure 2.2: Organization chart of Royal Dutch Philips

2.2 Philips Research

Founded in Eindhoven, the Netherlands, in 1914, Philips Research as part of Koninklijke Philips Electronics N.V. has expanded the scale and scope of its activities to become one of the world's major private research organizations.

Next to its laboratory in Eindhoven, Philips Research also has laboratories in England, France, Belgium, Germany, India, China and the United States, and is staffed by around 2,100 people, creating innovations in the areas of healthcare, lifestyle and enabling technologies. The common vision is to create technologies that will lead to products for improving people's lives. The activities of Philips Research have created a substantial part of the 100.000 active patents Philips currently has. In Europe, Philips is now number one in the patent top ten and in the United States they are number eight.

The annual research budget of Philips Research is slightly less than 1% of Royal Philips Electronics N.V.'s annual sales, which was more than 30 billion euros in 2004. About two-thirds of the corporate research work is geared to the activities of the Product Divisions of Philips Electronics, with contractual agreements about programs and costs. The remainder is research of a more exploratory nature. (Total R&D efforts of Philips Electronics amount to approximately 8% of sales.)

Scientists from a wide range of disciplines, from electrical engineering and physics to chemistry, mathematics, mechanics, information technology and software, work in close proximity, influencing and broadening each other's views. This implies that Philips Research reaps the benefits of synergy and cross-fertilization of ideas.

In close cooperation with the Philips Product Divisions, the Philips Research organization generates options for new and improved products and processes and produces important patents in many fields. These patents are important, because they protect technological achievements and enable Philips to gain access to the knowledge of others. Philips Research also provides a window on the outside scientific and technological world.

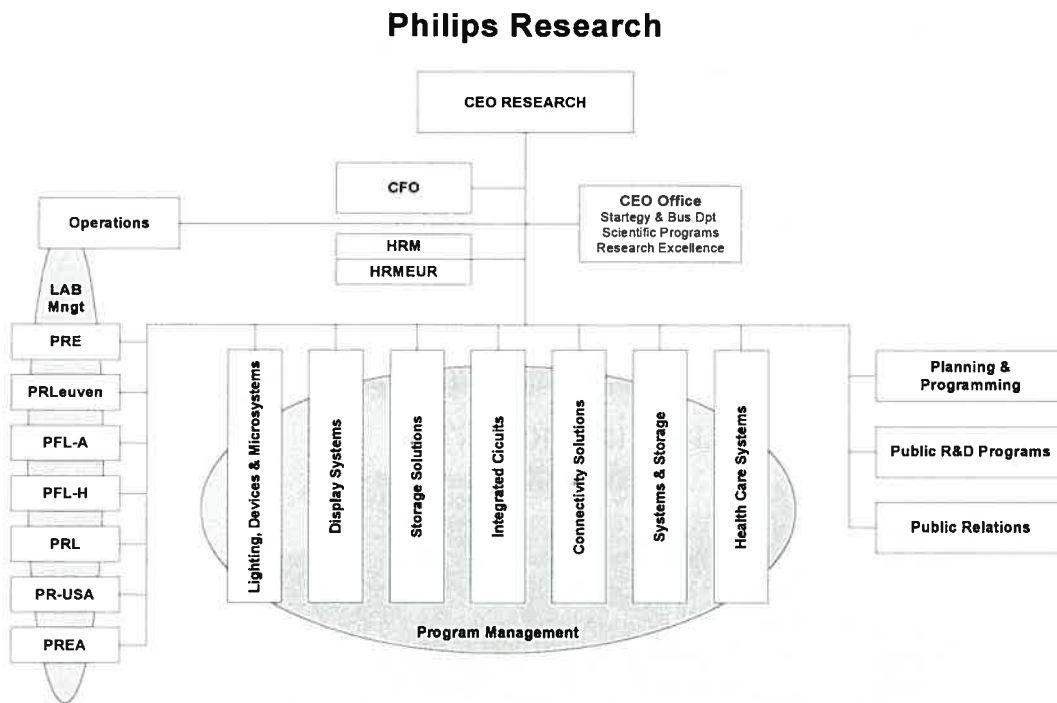


Figure 2.3: Organization chart of Philips Research

Figure 2.3 shows the organization chart of Philips Research at the moment of start of the research described in this report.

However, recently the Philips Research management had decided to change the current research programs into five newly defined programs to better reflect the focus of Royal Philips Electronics on Healthcare, Lifestyle and Technology. Those new research programs are:

- Healthcare & Wellness
- Digital Society
- Lighting & Visual Experiences
- Integrated Solutions
- Storage Solutions

The previous program Connectivity Solutions will be embedded in the Integrated Solutions program.

2.3 High Tech Campus and Philips Research Eindhoven

2.3.1 High Tech Campus (HTC)

The High Tech Campus Eindhoven, in the Netherlands is a worldwide well-known technology centre, with a diversity of high tech companies who work together in the development of new technologies, from idea, concept to prototyping and small series production. It provides advanced facilities and an optimized working culture for many thousands of top-notch engineers. It focuses on crucial technological areas such as microsystems, devices, embedded systems, signal processing and nanotechnology.

The High Tech Campus was initiated by Philips as part of the Open Innovation strategy (figure 2.4). The High Tech Campus used to be the Philips' NatLab in the past. It got more than 500 million euro investment by Philips. The area of the High Tech campus is about 220 acres, where about 25 new buildings are located, containing over 8,000 m² clean rooms, 50,000 m² lab, 100,000 m² office space and 75,000 – 80,000 m² additional development space, and housing over 50 nationalities. Figure 2.4 shows an overview of the High Tech Campus.

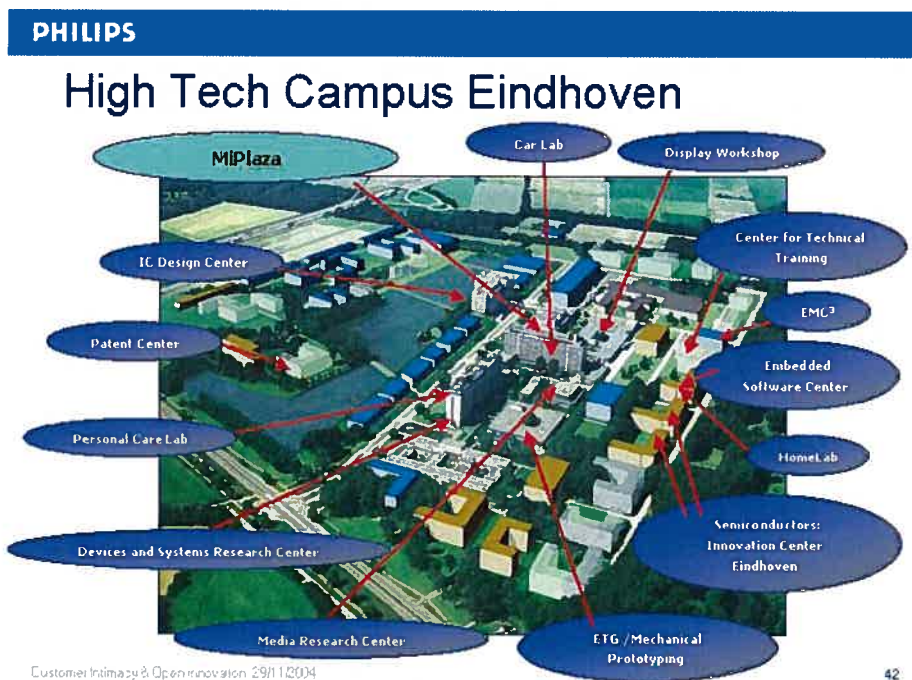


Figure 2.4: The High Tech Campus in Eindhoven, the Netherlands

Technologically advanced companies, like Philips Research, Atos Origin (as from 2005), FluXXion, Cytocentrics, Philips Semiconductors, Handshake Solutions and Dalsa are already in residence. Others such as ASML, FEI Company and TNO Industrial Technology are literally next-door, as is the renowned Technical University Eindhoven. About 40% of all private R&D activities in the Netherlands take place in the Eindhoven Region.

Under the theme ‘open innovation’, technological breakthrough is assisted by an emphasis on sharing equipment, services and knowledge. With access to facilities like prototyping, clean rooms, materials analysis and testing, companies can really accelerate development of new ideas. All in all, there are plenty of opportunities for co-operation, joint ventures, creating valuable partnerships and turning ideas into business ventures.

Furthermore the High Tech Campus Eindhoven is also situated in the middle of what has been described as Europe’s leading R&D region. This area, also known as the ‘Intelligence Delta’, stretches from Leuven and Aachen in the south to the important technical university towns of Delft and Enschede further north.

Over the past 100 years Philips has developed and launched many successful technologies. The spirit of co-operation has been crucial in these efforts. High Tech Campus Eindhoven will be a place that promotes interaction and teamwork. This is reflected in e.g. the architecture, campus sport and the shared seminars/conferences that are held in The Strip. This elongated building is the heart of the Campus and houses all shared facilities such as the Conference Center and various restaurants.

2.3.2 Philips Research Eindhoven (PRE)

Philips Research Eindhoven (PRE), formerly Natlab (from the Dutch name Natuurkundig Laboratorium), is located at the High Tech Campus in Eindhoven and is part of the world wide Philips Corporate Research effort.

PRE has several research groups, and one support group (Operations & Engineering) as shown in figure 2.5. These are:

- Philips Research Leuven
- Systems and Software
- Materials, Devices and Microsystems
- Display Systems and Care & Health Applications
- Storage
- IC Design
- Operations & Engineering

Through its cooperation with other leading industry players and world-class educational institutes, Philips Research is capable of attracting the brightest researchers from all over the globe to its Eindhoven laboratory in Europe's third most innovative region. The first two regions are Dresden in Germany, often referred to as Silicon Saxony (in contrast to Silicon Valley in the United States; Saxony is Germany’s easternmost federal state of which Dresden is the capital), and the Crolles-Grenoble region in eastern France.

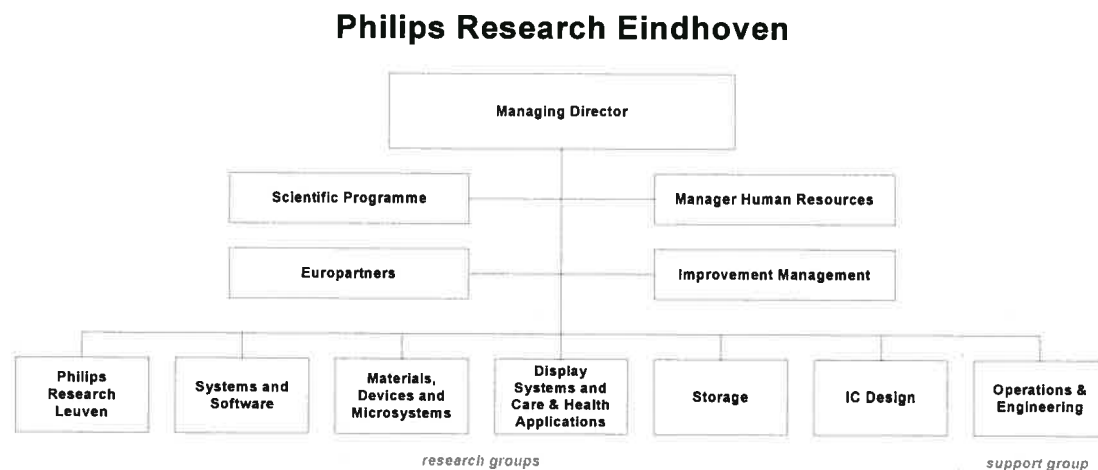


Figure 2.5: Organization chart of Philips Research Eindhoven (PRE)

2.3.3 Operations and Engineering

The sector Operations & Engineering (O&E) has seven departments as presented in figure 2.6. These departments are:

- Computer Services (networks, systems, applications & software, business information systems, information services)
- Centre for Technical Training
- Devices Technology Services (thin layers, display devices, equipment & engineering services, cleanroom facilities)
- Finance & Accounting
- Facilities & Purchasing
- Material Analyses (chemical, molecular and structures, surfaces and thin layers)
- Prototyping & Instrumentation (electronic designs and systems, software engineering, printed circuit boards, electronic & fotonic instrumentation)

O&E offers her services to among others:

- Philips Research (Eindhoven, Aachen, Briarcliff, etc.)
- High Technology Campus, Campus site management
- Organizations located at the High Technology Campus
- Organizations in the Eindhoven region

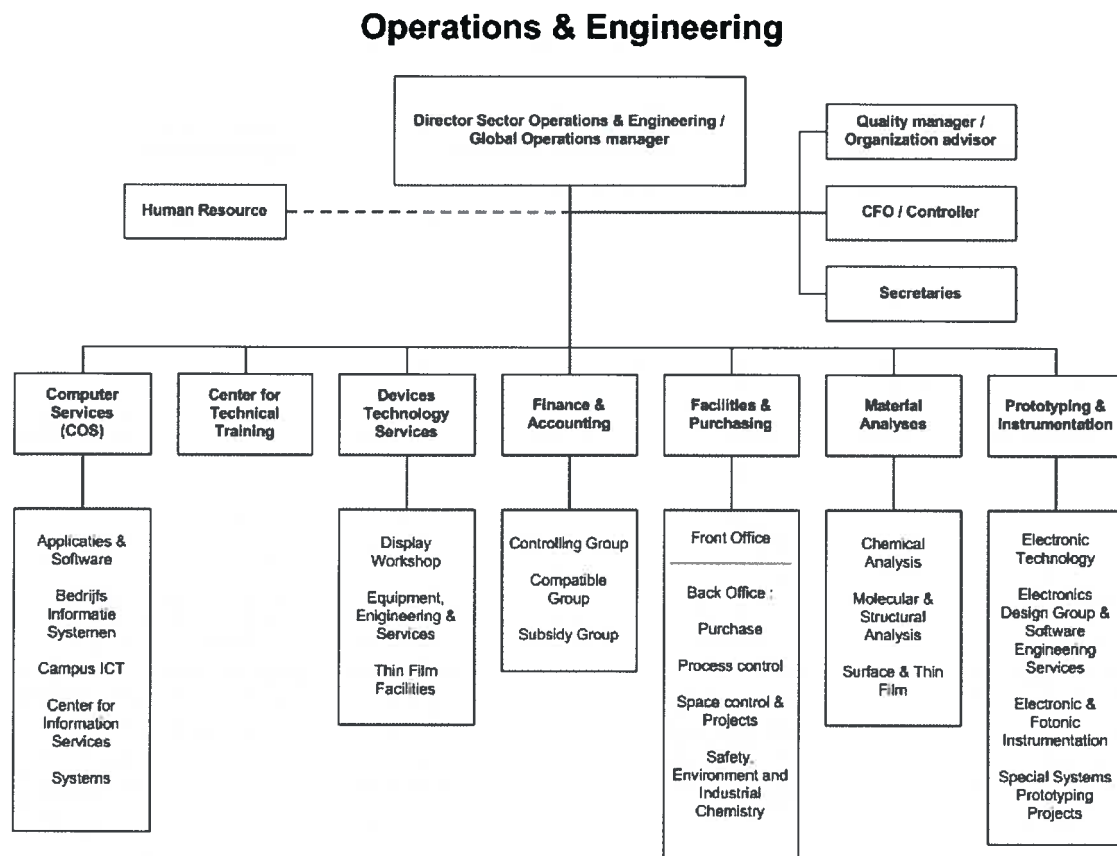


Figure 2.6: Organization chart of Operations & Engineering (O&E)

2.4 MiPlaza

Philips Research Eindhoven hosts the Microsystems Plaza (MiPlaza), a world-class interdisciplinary place for applied research aiming at business creation in the field of microsystems and nanotechnologies, enabled by innovations in materials and processing methods, state-of-the-art cleanroom infrastructure and a full spectrum of characterization facilities, at the High Tech Campus.

MiPlaza offers a meeting place and service center for scientists and engineers working on applications of microsystems and nanotechnology. World-class cleanroom facilities and high-tech services are being offered. Philips Research, the Philips Centre for Industrial Technology, various start-up companies, and the Dutch Foundation for Fundamental Research on Matter (FOM) are among the first users.

MiPlaza is formed by a collection of several parts of the Operations & Engineering group (the shaded parts in figure 2.7) and a few extra (the parts depicted with dotted borderlines), organized by the MiPlaza management.

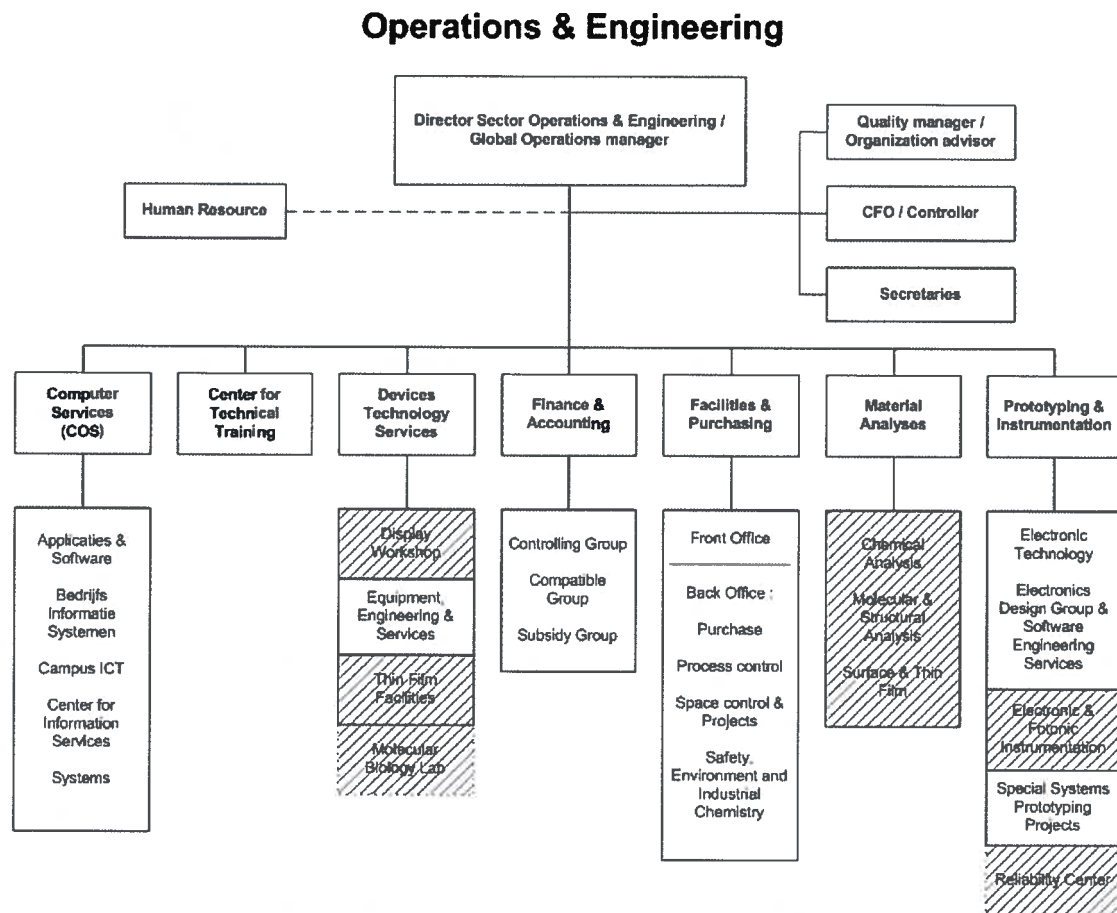


Figure 2.7: The parts of Operations & Engineering that form MiPlaza

The main goals of MiPlaza are in short offering a ‘toolbox’ (the facilities) for researchers to allow for experimentation and innovation, and, as the name suggests, serving a plaza-function to allow all network players to meet and easily contact each other, resulting in more and better cooperation among the several players, increasing their individual as well as cooperative innovation.

In this chapter a general description has been presented about what MiPlaza is and how it relates to Philips and the High Tech Campus in Eindhoven. The next chapter will discuss the reason for the creation of MiPlaza and how this forms the base for the central and research questions of this research that will subsequently be presented.

3. Research Design

In this chapter the research design is presented. In the first paragraph the goal of the assignment will be explained. Next the central question will be presented, followed by the research questions. And in the last paragraph the research approach is discussed.

3.1 Research goal

Introduction

Recently, as discussed by Chesbrough [2004], large companies with significant resources and long-term research programs experienced strong competition from small newcomers to the markets they operate in. As well, some of those large companies found that some of their research output was not useful for them, and abandoned these projects, to find out later that those projects turned into valuable companies. Besides this, Castells [1996] states that the difficulty for companies to break into new markets, or to keep up with the technological changes in the markets they already operate in, has encouraged greater cooperation among organizations and networking.

These issues created perspectives for the concept of Open Innovation as described by Chesbrough [2003a]. In short, this means that companies open themselves to license or spin-in research and/or developments from other organizations, and license or spin-out part of their own research or developments to other organizations, of which they think it might not be useful for themselves. The concept of Open Innovation will be described in more detail in chapter 4, the theoretical framework.

Among the large companies with extensive research programs and facilities was Royal Philips Electronics N.V., with Philips Research. The organization used to be completely vertically integrated with all research and development activities in-house. This is represented in figure 3.1a. It shows a funnel in which several research projects and new technologies, the blue dots, are filtered and tunneled towards a few development programs. No project or technology crosses the company borders, not inwards, not outwards. Because of reasons like stated by Castells, at the end of the 90s Philips started to form joint ventures with other companies, for example LG.Philips LCD in 1999. This is shown in figure 3.1b. In this picture it is also represented that not all research projects fit with the organization's main development programs and are 'blocked' in their way to development.

As a first real step in the direction of implementing the concept of Open Innovation, Philips recently opened up its High-Tech Campus in Eindhoven to other high-tech companies and 'technology accelerators'. Companies are encouraged to make use of both the infrastructure, so therefore facility sharing, and the considerable expertise and experience available on the Campus, and to work, subject to certain conditions, in a spirit of openness and cooperation with Philips Research personnel. The idea for the creation of such a large knowledge network in the Eindhoven region originates in the mid-90s.

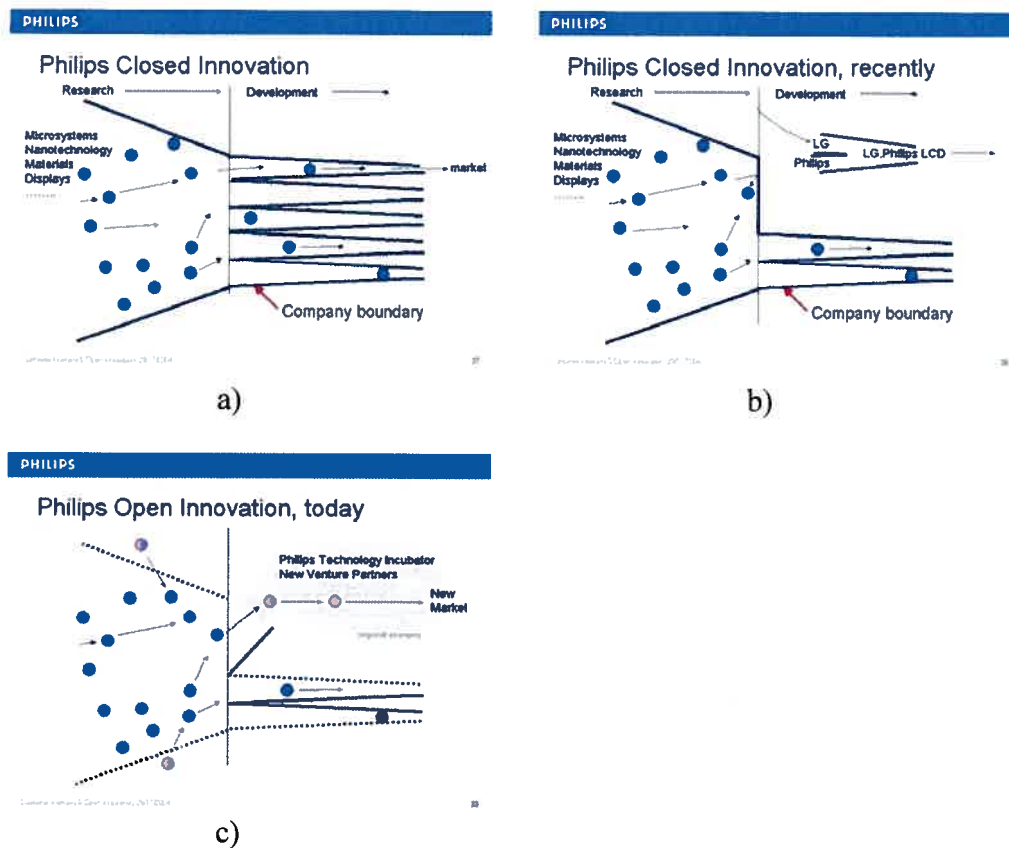


Figure 3.1: Philips, from Closed to Open Innovation

Today, Philips has implemented a lot of practices allowing for Open Innovation. There is facility sharing, not only at the High Tech Campus, but, for example, in Crolles (France) as well, where Philips runs a large semiconductor plant together with Freescale (previously Motorola) and ST Microelectronics. Philips has several kinds of R&D partnerships, collaborations and alliances. There is active technology licensing, supported by Philips Intellectual Property & Standards (IP&S). There are spin-ins and spin-outs of technology, and venture capitalist partners.

The Philips Technology Incubator was initialized in autumn 2002 and founded in 2003, to create new and successful businesses based on inventions from Philips research, helping to identify business opportunities and assists the project teams in the transformation of an R&D project into a new business.

Figure 3.1c represents the Open Innovation situation of Philips today. As can be seen in the picture, the company border lines are dashed, to represent the openness for technologies to cross the company borders. In the picture there are three purple dots, representing two spun-in external technologies, as well as one spun-out technology into Philips Technology Incubator and/or New Venture Partners. It is clear that the 'blockade' has been opened. Figure 3.2 shows how the High Tech Campus is related to Open Innovation concept, in comparison with the previous Closed Innovation situation.

PHILIPS

From 'internal' to 'open innovation'

Companies, Start-ups & Institutes
from 1970

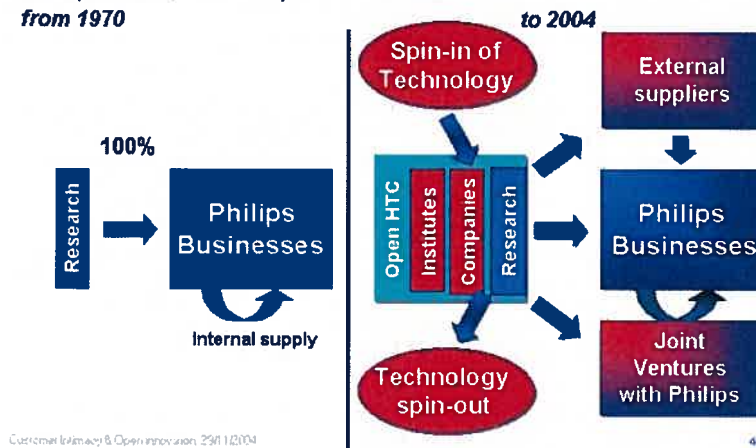


Figure 3.2: The High Tech Campus in the Open Innovation concept

During the paradigm shift from Closed to Open Innovation, the general way of thinking of 'the lab is our world' shifted towards 'the world is our lab' (figure 3.3). Whereas first the focus was to get and keep smart people inside the company, nowadays there is a world size pool of smart people, on which organizations can draw. In the past, after a new invention or discovery a product was developed and then shipped, all by Philips. So, it was important to be the first to discover something and be the first on the market. The focus now is more on claiming a part of the created value of a product. So, others can benefit from Philips Research by putting products on the market, where Philips has already claimed its added value. In the Closed Innovation era the creation of ideas was very important, whereas nowadays the focus is more on using ideas. Intellectual properties (IPs) are used for trade today, while in the past the focus was on controlling the closed IPs.



Figure 3.3: Paradigm shift from Closed to Open Innovation

As a next step of implementing the concept of Open Innovation, the new cleanroom facilities of Philips Research, MiPlaza, are offered to third party researchers and engineers active in the field of micro and nanosystems. Among the first users are Philips Research itself, Philips CFT, start-up companies like FluXXion and the Dutch Foundation for Fundamental Research on Matter (FOM). These organizations do not only benefit from the major cost savings that come from facility sharing, but also from the stimulating cooperative atmosphere and know-how concentration at MiPlaza. It is an explicit aim of MiPlaza to open up opportunities for new joint ventures and spin-offs and for better integration of university and industrial research.

By this form of cooperation, organizations might get access to the migratory as well as the embedded knowledge of other participating organizations, creating a knowledge link, alliances through which an organization wants to learn or jointly create new capabilities and knowledge [Badaracco, 1991].

In the Open Innovation R&D community, MiPlaza's closest relations in the network are its customers and its partners. With both kinds of relations MiPlaza is creating some kind of knowledge link. In figure 3.4 a part of this network is depicted.

The customers of MiPlaza are organizations that come to make use of the facilities and infrastructure, as well as the concentration of knowledge. MiPlaza's partners are high-tech equipment manufacturers that keep a close relation with MiPlaza by supplying equipment to the labs.

Both MiPlaza's customers as well as the partners have in their turn their own customers. Although these customers do not have direct contact with MiPlaza, they might as well benefit indirectly from the network through the MiPlaza's direct contacts.

Most of MiPlaza's current alliances are located at or near the High Tech Campus, but they do not necessarily need to be so.

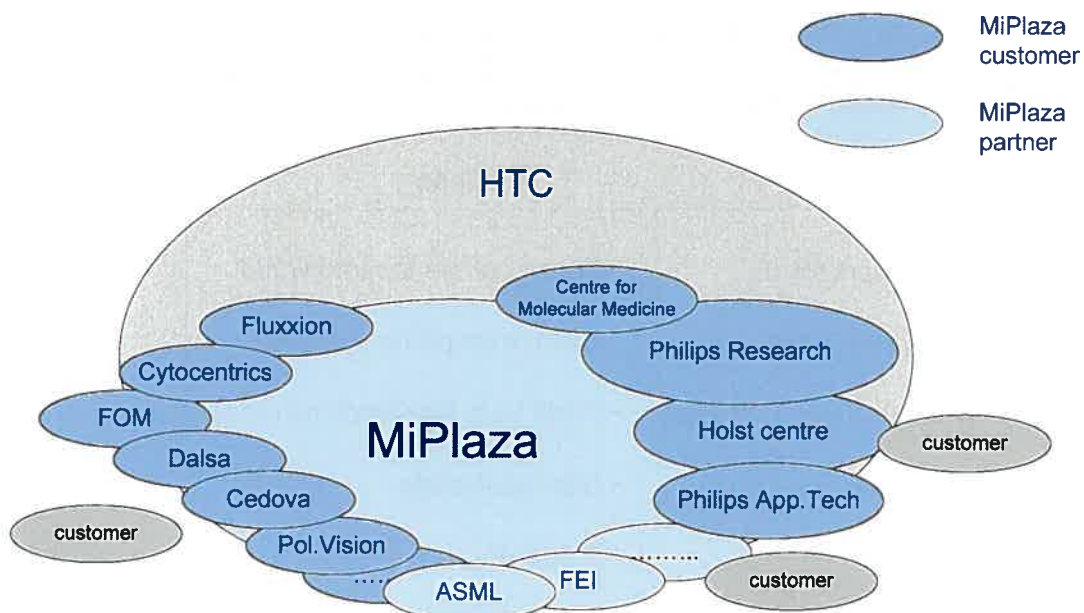


Figure 3.4: The value network of MiPlaza

In the semiconductor industry, there is the empirical observation (as well as self-fulfilling prophecy) that the data density doubles about every 18 months. This is called Moore's Law. (In 1965, Gordon Moore, co-founder of Intel, observed that the number of transistors per square inch on integrated circuits had doubled every year since the integrated circuit was invented. He predicted that this trend would continue. However, the pace had slowed down a bit, and nowadays the definition of Moore's Law relates to the data density doubling.) Moore's Law is expected to last at least another 10 years.

But, today electronic systems increasingly integrate heterogeneous technologies and a diversity of standards [Declerck, 2005]. Heterogeneous technologies – like BiCMOS, rCMOS, passives, micro-electromechanical systems (MEMS), environment-conscious smart devices, etc. – are attempted to be combined in a systems-in-package [Cooke, 2005]. This complexification of devices is referred to as “Moore than More”.

Philips would like to keep their expertise state-of-the-art in the wide range of More than Moore's technologies. However, that costs a lot of money. So, one of the main motives for Philips to start up MiPlaza is to share resources with other parties (customers/users or partners who wish to learn from the new application fields), to keep the costs bearable and still having access to the wide range of technologies. For customers the motives to come to MiPlaza are expected to be mainly cost efficiency, but access to the knowledge network (engineers and experts at MiPlaza) as well.

The motives for MiPlaza's partners to participate are expected to be the ability to have a look in the R&D community to find out what customers wish for, to find new markets, and to have users (prospective customers) get used to their equipment.

Purpose

This graduation assignment focuses on MiPlaza. When operating in an Open Innovation community it is important as organization to have the proper identity, therefore MiPlaza needs to be rather clear where the organization stands.

Is MiPlaza an R&D program organization, or is it a service provider? And then how broad should the scope be? Is it only for renting cleanroom space, or not? Or do they want to be more like a consultant? Is the situation at the High Tech Campus changing in such a way that MiPlaza needs to adapt to it?

MiPlaza's main customer is Philips research, about 70% to 75% of the work done. Is that a healthy situation, or does it need to change? To what extent should MiPlaza serve other organizations? Does MiPlaza need to become independent, with Philips Research as a large customer?

There are plenty of ways to take a position in such an innovative community, and it is important for MiPlaza to clearly mark the position with respect to other players.

For example, MiPlaza deals not so much with products, but with knowledge. Knowledge is in fact the most valuable thing that is produced in this community. But the question is now whether MiPlaza is the knowledge producing organization, or someone else. That needs to be clear. In cooperation with e.g. Philips Research or the Holst center, *those* are the knowledge producing organizations, supported by MiPlaza. However, MiPlaza learns from this produced knowledge, and it can supply some

likewise obtained knowledge as well. This creates a problem, since MiPlaza needs to be able to work with organization A, B and C, despite the fact that they absorb knowledge from the partner or customer they already cooperate with. If knowledge created in the cooperation with a specific customer would be exclusive for this customer, MiPlaza would in fact be contaminated. MiPlaza needs to keep the freedom of action to be able to work with other customers afterwards. This is only possible when all parties clearly know each other's positions in the community.

The questions of who MiPlaza wants to be is not only important with regard to the customers and partners, but with regard to the internal organization as well. If, for example, MiPlaza would work exclusively for Philips Research, all employees would just be colleagues and won't need to be careful what they say. But if MiPlaza serves multiple organizations, acting more like an independent service organization, the employees need to understand the goals of the organization. That role, whatever it should be, may be different than those of similar organizations, or may differ from the expectations some people or organizations have. Customers will have their opinions about the role of MiPlaza, and partners might have other opinions. They might want MiPlaza's portfolio be extended, or maybe shifted.

The management of MiPlaza now wants to clearly define the role that the organization needs to take in the Open Innovation R&D community in the Eindhoven region. It is the purpose of this graduation assignment to assist MiPlaza in defining this role. This will be done by an analysis of the role or roles of MiPlaza as experienced, but also as desired, by its stakeholders, as well as the role that similar organizations perform in the community.

3.2 Central question

The core question of this assignment can now be defined as:

What should be the role of MiPlaza within the Open Innovation R&D community in the Eindhoven region ?

This core question consists of two important elements, *role* and *Open Innovation R&D community*. These two elements will be elaborated now. First the Open Innovation R&D community will be discussed, and second the definition of role, especially in relation to this community.

In general, a community is an amalgamation of living things, which can be any plant or animal, that share an environment. The driver of a community is that all individual subjects in the mix have something in common, but what characterizes a community is sharing interaction among the individuals in many ways.

When several individuals all work in the field of research and development (R&D) and interact with each other regarding the topics of their common R&D activities, one can speak of a R&D community, where the members of the community (a group with a common interest [Miller, 2001]) can be spread among academic institutes, federal research labs or the industry. The Open Innovation R&D community is a collection of

organizations in which the participants behave, communicate and cooperate by the ideas of Open Innovation [Chesbrough, 2003a].

With today's global markets and R&D organizations interacting with each other around the world, the Open Innovation R&D community can be considered as a world wide network. However, regional networks with more intense interaction can be identified as well.

In this assignment the Open Innovation R&D community is considered to be the regional network of R&D organizations, in particular the micro and nanotechnology related organizations, located in the Eindhoven region, in which the participants interact and cooperate more or less by Open Innovation.

A role is a set of actions and activities assigned to or required or expected of an actor [Miller, 2001]. Usually these actors are considered to be human beings part of a society, but they can be organizations as well, where the social situation is the position in the network. The expectations define behavioral requirements or limits ascribed to the role by the focal actor filling that position, or by others who relate to the role or simply have notions about it, and are conditioned by general experience and knowledge, values, perceptions, and specific experience with focal actor(s) [Rizzo, House, Lirtzman, 1970]. So, a role is what an actor *does*, not what an actor *is*. Therefore, the role of MiPlaza as stated in the central question is the set of expectations the other actors in the Open Innovation R&D community MiPlaza participates in place on MiPlaza, regarding what it will or should be doing and what it should not do.

3.3 Research questions

Since the expectations of the other organizations in the R&D community are crucial in defining the desired role in the innovation process, it is necessary to find out who's expectations matter to MiPlaza, so who are MiPlaza's stakeholders, and what these expectations are. Additionally, it could be interesting to compare this role to the role that similar organizations perform in their communities, which gives an indication of feasible roles in the reality of business.

So, to analyze the core problem of this assignment, the research has been split up into two sub questions :

Which role(s) in the innovation process should MiPlaza perform according to the stakeholders?

Which role(s) in the innovation process do similar organizations perform?

The first sub question will be covered in chapter 6 and will be answered by analyzing the stakeholders perception of the current role MiPlaza performs, what the opportunities and threats of the concept of MiPlaza are for the stakeholders, and the position of the stakeholders on which role MiPlaza should perform.

The second sub question will be covered in chapter 7 and will analyze the role(s) of organizations more or less similar to MiPlaza and how those organizations deal with the threats identified by MiPlaza's stakeholders in chapter 6.

3.4 Research approach

To be able to answer the question which role(s) in the innovation process MiPlaza should perform according to the stakeholders, and what opportunities or threats stakeholders experience or identify with the concept of MiPlaza, a stakeholder analysis will be performed. To obtain the needed information for the analysis, a survey will be performed among the stakeholders by interviews, since it provides the best options to ask specific questions and go deeper into particular topics in the limited amount of time.

The start will be to determine which questions to ask and how to prepare for the interviews, based on the tools that will be developed in chapter 5. First an outline will be made which questions need to be answered in the survey, in general as well as in relation to the specific type of stakeholder group the interviewee belongs to. Then the stakeholders will be contacted.

With the feedback of the stakeholders, among which problems and negative aspects the stakeholders might mention, as well as appreciated aspects, the main issues MiPlaza needs to focus on will be determined.

Then, to answer to which roles MiPlaza should focus, and how MiPlaza could deal with the experienced threats, a limited (due to time and resources) comparative study among similar organizations will be performed on how these organizations deal with those issues. For this study, interviews will be performed with those organizations as well.

Finally, the solutions will result in conclusions and recommendations for MiPlaza business development regarding the role MiPlaza should take in the Open Innovation R&D community.

The interview preparation was performed in August 2005, with the stakeholder interviews from August till November. The interviews with similar organizations for the second sub question were performed in November and December. During the interview period there were regular feedback meetings with MiPlaza business development, to discuss the interviews and to report notable or important issues mentioned during the interviews.

In January and February 2006 the results of the interviews with similar organizations were analyzed regarding their roles and how they deal with the issues and problems identified by the stakeholders, leading to the conclusions and recommendations regarding the role of MiPlaza in the Open Innovation R&D community.

4. Theoretical Framework

In this chapter the theoretical framework will be laid out as base for the research.

In the first paragraph the concept of Open Innovation which was introduced in the previous chapter will be presented in more detail, to explain the ideological fundamentals and operating environment for MiPlaza and it's stakeholders, which will be used as research base during the stakeholder analysis. Also, some by literature suggested key aspects for successful collaboration in innovation networks will be discussed.

In the second paragraph several roles organizations can perform in innovation networks will be discussed.

The last paragraph focuses on the theory of the stakeholder analysis, which forms the basis of the main research approach.

4.1 Open Innovation and innovation networks

In the past, large research based companies did the most research in their own industries and earned most of the profits in these industries as well. New market entrants and startups had to create their own labs if they were to have any chance against the market leaders. If they could not afford such research or research facilities, they were at a disadvantage.

Recently, however, a lot of newcomers overtook the market with little or no research of their own. This is caused by a paradigm shift from Closed to Open Innovation.

Closed innovation is a view which states that successful innovation requires control, which holds that companies must generate their own ideas and then develop, build, market, distribute, service, finance, and support them on their own [Chesbrough, 2004]. During the 20th century, companies gained competitive advantage by funding research laboratories which developed technologies that formed the basis of new products with high profit margins [Chesbrough, 2003a]. These organizations are vertically integrated, since research, development, prototyping, production, etc. are all in-house.

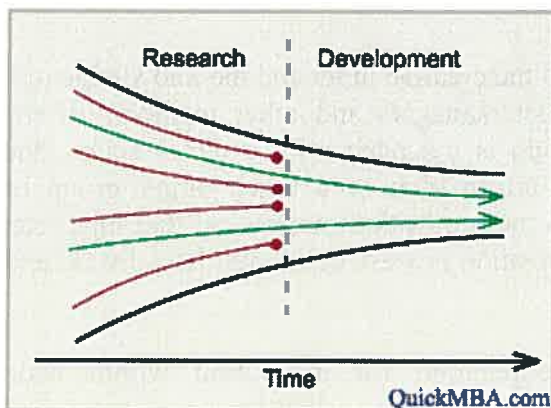


Figure 4.1: Closed Innovation concept [QuickMBA, 2005]

The innovation concept of the vertically integrated organizations is depicted in figure 4.1. In this figure the green lines represent projects that go from idea, through research, to development, to market. So they are the research projects that make their way to the market. However, not all research project in a vertically integrated organization will make it to the market. It can happen that a research project is successful and completed, sometimes resulting in patents, but that it doesn't make it to development. These kind of research projects are represented by the red lines. One of the main reasons for such projects not to be continued into the development stage is that they do not actually fit the organization's core business, despite the fact it might be a very interesting or promising research project. These projects are often shelved until a market opportunity presents itself, which does fit the organization's core business, if that happens at all.

In the highly competitive world today, the Closed Innovation approach is increasingly no longer sustainable. The early picture of the solitary innovative entrepreneur, after Schumpeter [1942], gives way to the obviously more complicated view of the innovation process as a network. Therefore, the success of an innovation is to a large extent based on the capabilities of the organization to cooperate with external actors through all phases of the innovation process. [Reichwald and Piller, 2005]

In contrast to the classical closed process, in which organizations only use the ideas originating from their own research laboratories, Open Innovation (figure 4.2) states that firms can and should use external as well as internal ideas, and both internal and external paths to market [Chesbrough, 2004].

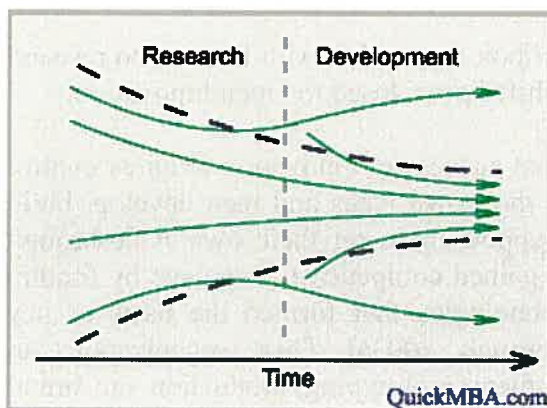


Figure 4.2: Open Innovation concept [QuickMBA, 2005]

“Closed” innovation processes are limited to the creative input and the knowledge of a relatively small group of engineers, product managers and other members of the product development team. When this group is extended with external actors, the ideas, creativity, knowledge and solution information of a much larger group of individuals and organizations can flow into the innovation process, so that input can be used which was not available for the innovation process in the past [Reichwald and Piller, 2005].

Open Innovation is characterized by cooperation for innovation within wide horizontal and vertical networks of universities, start-ups, suppliers, customers, and competitors [Laursen and Salter, 2004]. The lever effect of Open Innovation is based

on the broadness of ideas and solution finding, where it's soul is not only improving the access to needs-information by involving external actors, but also to obtain a broader access to solution-information [Reichwald and Piller, 2005]. Ideas can come into the process, for example, from internal research investigations, from external research, from licensing in technologies created by other actors, or from an acquisition of a company's product. Similarly, ideas can flow out of the process to market in numerous ways. Many go to market through the company's own channels, while others may be licensed out to external actors that are able to utilize the idea or technology, creating a win-win situation, or they may be spun out into a new venture, or into a new joint venture [Chesbrough, 2003b]. This concept of open innovation is demonstrated in figure 4.3.

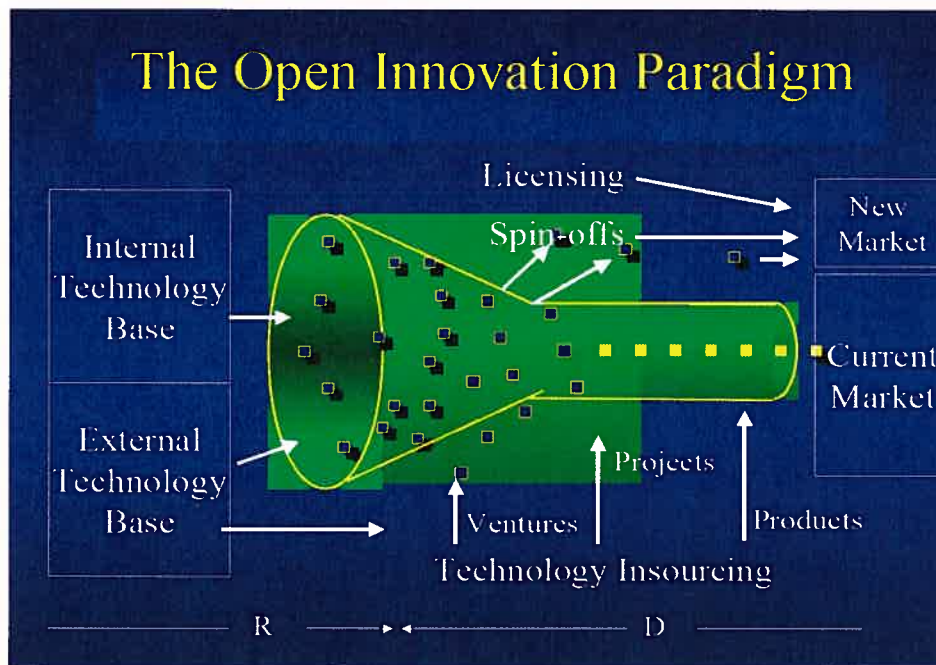


Figure 4.3: R&D Concept of Open Innovation in more detail [Chesbrough, 2003b]

In an open innovation business network, several aspects are crucial for successful innovation creativity and cooperation. These could be environmental aspects, which define the fundamental factors of the environment for successful innovation, or organizational aspects, which focus on what an organization better should or should not do.

According to Sitra [2005], the significance of innovation environments has been emphasized in parallel with the innovation system, such as Open Innovation. The concept of an innovation environment does not replace the innovation system, but they supplement each other. The innovation system is the foundation of the innovation environment. In figure 4.4 the fundamental factors of such an innovation environment are presented. For a successful creative innovation environment all elements should be present: funding, competent labor, scientific education, transfer of know-how, innovation enterprises, a globally operating industry, and (professional) business services. The core of innovation environments is an information and communication environment, with a lot of cooperation and interaction, in which research and practice

are intertwined and in which opportunities for both conscious and unconscious learning are continuously created.

Research on innovation and creativity has indicated that “the quality of the location” is very significant for innovation activity. Successful locations and high-quality innovation environments bound to a certain place where all the fundamental factors are present attract experts and investments.

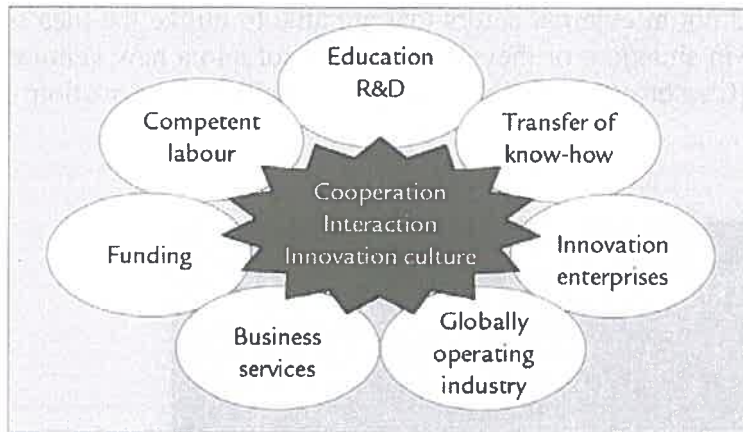


Figure 4.4: Fundamental factors of a creative innovation environment [Sitra, 2005]

The information and communication environment as mentioned by Sitra is emphasized by Smith, Dickson and Smith [1991], who found in their study on innovation and collaboration within networks of large and small firms that the existence of informal, personal networks among the scientific and engineering elite is the key factor in the establishment of collaborative links. In many cases, these links are based on professional, scientific trust at the early research stages, which is later formalized when commercial/production possibilities arise. Pre-existing networks are often the basis of collaboration, as personal contacts are used to target key people in potential partner firms, and provide the basis of professional trust on which successful technical collaboration depends. As stated by Dyer and Nobeoka [2000], a minimum level of trust is essential for the interpersonal sharing of knowledge. The emphasis on trust and collective identity of actors is an obvious challenge for a hub firm in an innovation network. In networks organizations cannot live by absorbing knowledge alone, they do need to contribute something to the network that is proprietary to them, as nobody wants to partner with an organization that only takes and does not give in return [de Man, 2004]. So, a partnering orientation and personnel who have, besides functional expertise, the strong interaction skills required in multiparty and cross-functional teams are required [Möller and Svahn, 2002].

Besides formal and informal communication, Möller and Svahn mention two other crucial aspects for actively participating in and influencing the creation of new business or technology networks, which are the attractiveness of the vision or direction that an actor can offer, and the relative importance of the knowledge and resources that it controls for the other potential members of the network.

In innovation networks there is a lot of ambiguity and uncertainty on which actors master which value activities and what kind of knowledge. An ability to develop a systemic view of the network with its different types of actors and envision promising new business concepts is valuable as it reduces the perceived uncertainty and provides direction for action. However, vision alone is not enough, a strong position in the field and a clear identity are required as well.

A hub firm in a network should have specific resources and knowledge that make it an attractive mobilizer for other network actors and potential partners [Möller and Svahn, 2002]. It must be able to create an organizational forum for sharing the work and responsibilities between the actors, to establish coordination mechanisms for network cooperation, and to instill a network identity [Dyer and Nobeoka, 2000; Gadde and Håkansson, 2001]. This role requires visioning, communication and persuasive skills, coupled with the credibility that can only be achieved through thorough understanding of the field and a strong identity and business position [Möller and Svahn, 2002]. The above mentioned fundamental organizational factors for successful innovation creativity and cooperation are presented in figure 4.5. The *interorganizational* factors are shown in the center star, whereas the *intraorganizational* factors are shown in the surrounding circles.

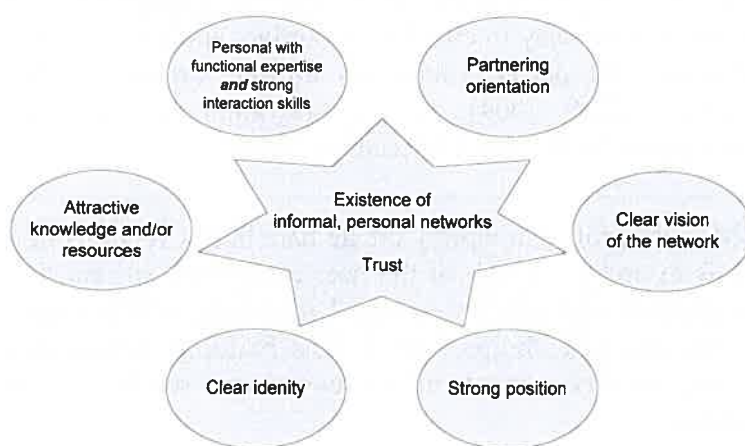


Figure 4.5: Fundamental factors of a successful innovation network and its actors

4.2 Organizational roles in innovation networks

In a business network, an organization can play hundreds of different roles. However, it is out of the scope of this research to try and list all imaginable roles, as most roles are variants or combinations of the major roles. Therefore, only the major and most common roles will be discussed. One, or a combination of several, of these roles can be fine-tuned for MiPlaza, based on both the stakeholders' feedback as well as the roles of similar organizations, to a clearly defined role.

Hering and Philips [2005] describe eight important roles in innovation, which they identified as connector, librarian, framer, judge, prototyper, metric monitor, story teller and scout. However, their white paper focuses on innovation within an organization, which is in fact Closed Innovation, and thereby focuses on the innovation roles people perform within the organization. In the case of Open Innovation, firms use external as well as internal ideas and internal and external paths to market [Chesbrough, 2004]. Therefore, some stages - and therewith some roles - of the innovation process can be performed by other actors in the network. Where all innovation roles were performed within a single organization in the case of Closed Innovation, roles are performed within the network in the case of Open Innovation. So, even though Hering and Philips focus on closed innovation, several of their

innovation roles could be performed by the different actors in the innovation network as well. The roles that can be performed by a network actor are explained below:

Connector

The connector role creates connections to other people and technologies within an organization, and connects an organization to customers and business partners who can help. Connectors reduce the time to find the appropriate connections and improve the chance of making a valuable connection. This role resembles the network facilitator role as mentioned by Allen Blewitt in 'The International Innovation Network' [Abernethy, 2002].

Librarian

The role of librarian, or knowledge center, collects information and ideas and provides organized access to others who can help build the library and make sense of the current collection. It provides an easy way to check in, examine, and add to ideas, solutions, problems, technologies, and needs. Librarians cluster, organize, find, reference and relate information [IBM, 2004]. In an innovation network this resembles the broker role as mentioned by Blewitt [Abernethy, 2002].

Prototyper

The prototyper or builder [IBM, 2004] role can rapidly create bare bones versions of a product. The goal of this role is to create enough of the user experience so real live customers can work with the product and provide essential feedback, which allows further tuning of the product [Hering and Philips, 2005]. This building, testing and perfecting is iterated until a final prototype meets all the customers' needs and the product can be put into production.

Scout

The role of scout or explorer [IBM, 2004] is to identify new trends and analyze their potential impact in the business of the organization or network. It defines what is happening and what is likely to happen in the organization's or network's market as well as tangential markets [Hering and Philips, 2005]. It makes clear what trends are important and which should be considered to incorporate with the innovation process of the organization or network.

Besides the roles mentioned by Hering and Philips, IBM Business Consulting Services lists several additional innovation roles in their framework of in total 15 innovation roles [IBM, 2004], which they had developed from a study of several other publications. Some of those roles are purely *intra*organizational roles as well, that do not translate to *inter*organizational roles, while some other roles are only found in the last stages of an innovation like mass production and sales, and are thereby irrelevant for this research, as the scope of this research is within R&D networks which cover the early stages (idea/insight, research, development) of an innovation. The remaining roles not mentioned by Hering and Philips, which can be performed by an organization in an innovation network, are inventor, scrounger and financier:

Inventor

The role of the inventor is to make an idea into something more tangible. The inventor designs, builds, adapts, applies, pilots and demonstrates innovations.

Scrounger

As real work needs real resources, the role of scrounger is to find those resources, get them and hold onto them. Usually those resources are of financial nature.

Financier

The role of financier is to provide money and resources for an innovation. The financier can help shape the innovation and move it to the market in a timely way by providing as well as restricting the funding.

All the roles mentioned so far originate from the innovation roles a person could have within an organization and can be translated into organizational roles within a network. However, in innovation networks some other, often more complex, roles can be identified as well. Roles that are commonly found in R&D networks are described below:

Program organization

In Open Innovation networks there can be the role of a program organization. Such an organization is a R&D center which employs several programs in partnership with universities and industrial actors in the innovation network. It offers research based on well-defined roadmaps to its program partners and network actors [Azono, 2005], where research is performed up to demonstrator level and then the partners can further commercialize the results into a product [Holst, 2008]. The role of program institute in an innovation network is similar to the coordinator role as described by IBM [2004], which must plan, allocate, assign, schedule, put into scope and assure completion of an innovation program.

Facilitator

In general the facilitator role in a business network is to provide facilities to the other network partners. In a R&D network this role can provide cost savings in relation to physical facility operations through shared tenancy of the facilities by the network partners. That means, the facilitator can offer equipment or special facilities, which would be too expensive for the individual network partners to buy or operate on their own, and share the costs of operation among all users. Shared facility services can therefore extend capabilities of key nanomanufacturing centers, like instrumentation and metrology, to a broader set of researchers [Postek and Hocken, 2004]. In case of Open Innovation networks, collaborative research could be done in such a shared facility, where researchers from the different network partners could mingle [Thornberry, 2002].

Incubator

A (business) incubator is an organization whose role is to assist new businesses to become established and sustainable during their start up phase. In the 1980's, the 'first generation' incubators essentially offered affordable space and shared facilities to carefully selected entrepreneurial start-ups. Later the need was recognized for supplementing the work space with counseling, skills enhancement and networking services to access professional support and seed capital, which led to the 'second generation' incubators in the 1990's [Lalkaka, 2001].

Center of excellence

The role of a center of excellence can be defined as an organizational unit that embodies a set of capabilities that has been explicitly recognized by the firm as an important source of value creation, with the intention that these capabilities be leveraged by and/or disseminated to other parts of the firm [Frost, 2002]. In the network environment this can be an institution that possesses special knowledge or expertise in a particular area of concern and incorporated into the collaborative environment to

facilitate and coordinate development of the products by supporting (key) functions and operations [Meta, 2004].

Professional services provider

The role of professional service provider is to attract, mobilize, develop and transform the knowledge of it's employees to create value for their clients and can be found in many fields, e.g. engineering, accountancy, consultancy, law, etc. [Løwendahl, Revang and Fosstenløyken, 2001]. It is a knowledge-based organization, often highly technical, which attracts and retains highly skilled individuals [Filiatrault and Lapierre, 1997]. Professional service firms involve a high degree of customization and have a strong component of face-to-face interaction [Maister, 1993].

Special cases of professional service providers in R&D networks are *engineering offices* [Filiatrault and Lapierre, 1997], *test centers* [Crane, 2001; Utz and Dahlman, 2007] and *analytical / scientific research centers*. [Nordberg, Campbell and Verbeke, 1996; Valcárcel, Simonet and Cárdenas, 2007]

In table 4.1 a summarizing overview is presented of the mentioned roles in innovation networks with short descriptions of those roles.

| Role | Description |
|-------------------------------------|---|
| Connector | Creating connections with people or organizations that can help with an innovation |
| Librarian (Knowledge center) | Collecting and providing access to knowledge, information and ideas |
| Prototyper | Building working products in an early stage to demonstrate and test a new innovation |
| Scout | Identifying new trends and analyzing their potential impact |
| Inventor | Making an idea into something more tangible |
| Scrounger | Finding the necessary resources for innovation |
| Financier | Providing financial resources |
| Program Organization | Coordinating specific programs in which the network participants can cooperate to create a new product or technology together |
| Facilitator | Providing the facilities, letting the clients do their own things |
| Incubator | Assisting new businesses to become established and sustainable during their start up phase |
| Center of Excellence | Facilitating development of products by supporting (key) functions and operations, using its special knowledge or expertise |
| Professional Services Provider | Creating value for customers by applying professional knowledge, like e.g. accountancy, consultancy, engineering, legal/law, etc. |
| * <i>Engineering office</i> | Providing highly-skilled support to clients for the development of innovative products based on a brief idea. |
| * <i>Test center</i> | Center for testing and improving new technologies |
| * <i>Analytical research center</i> | Providing analytical research. Analyzing the properties of materials or products |

Table 4.1: Overview of roles in innovation networks. The last three roles are special cases of the Professional Services Provider role often found in R&D networks.

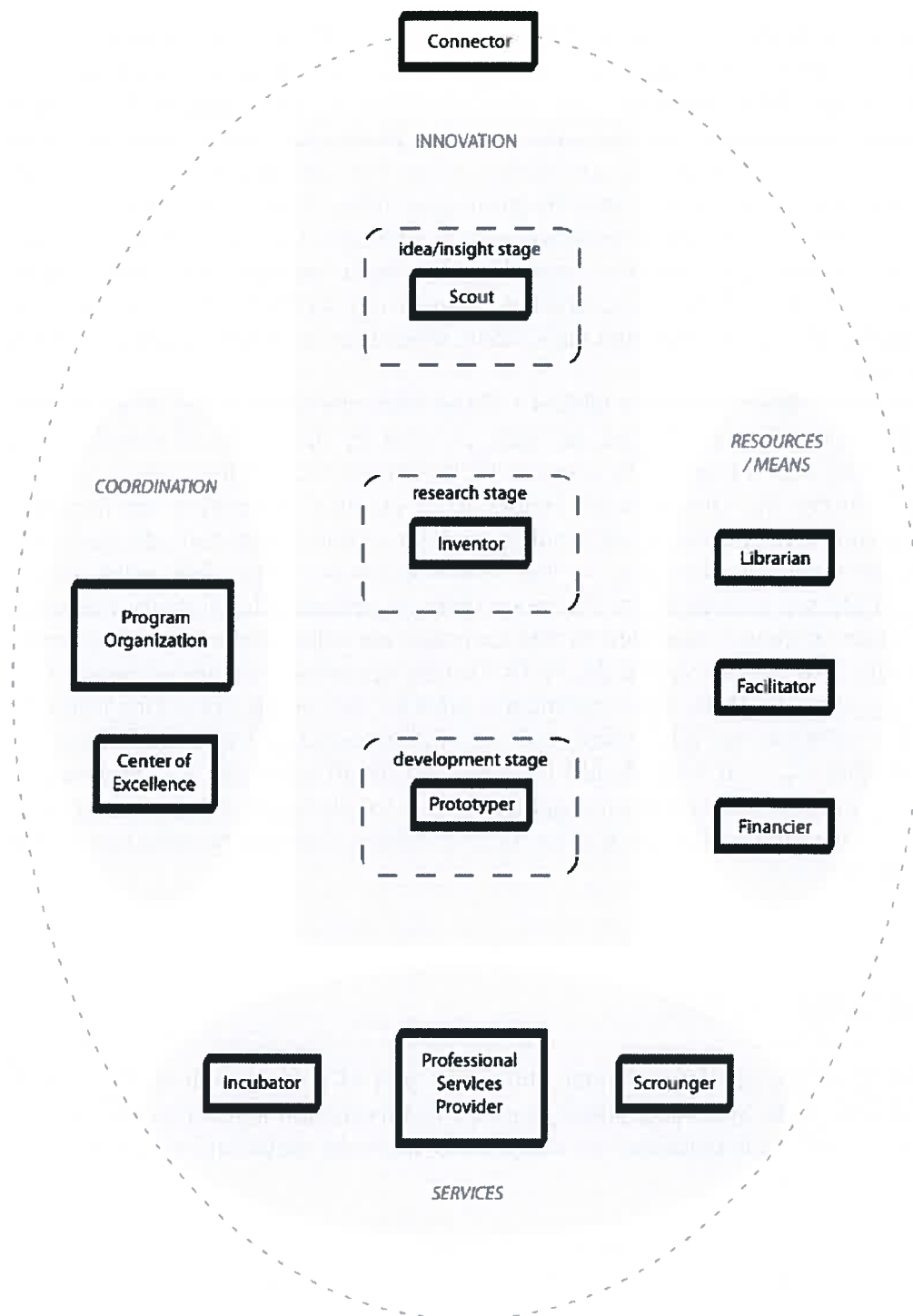


Figure 4.6: Categorization of the innovation network roles listed in table 4.1.

In figure 4.6 a scheme is presented that shows the categorization of the roles which were described above in an innovation, a coordination, a resources / means and a services category, whereas the connector role takes care of connecting roles when necessary or desired. The roles in the figure could be played by all different organizations in the network, but it is just as well possible that an organization performs several of these roles. As an example of interactions between the different roles, the inventor and prototyper can exchange knowledge with the librarian and

make use of the facilities of the facilitator to analyze, make and test their products. They can also have a scrounger find a financier for their monetary resources. An incubator in an R&D network can provide organizational support for startup organizations performing the inventor and/or prototyper roles. The program organization and the center of excellence roles can coordinate innovations by directing the scout, the inventor and the prototyper roles. If necessary, the inventor, prototyper, center of excellence, program organization and facilitator roles can make use of the professional services providers for both non-technical (like legal, consultancy, etc.) as well as technical (like engineering) services. The connector role helps bringing roles in contact with each other, when they are spread among multiple organizations.

The figure shows that with the in table 4.1 listed roles, the three stages of innovation in an R&D network are covered, as well as roles in the fields of coordination, resources/means and services. The services field provides the business services factor mentioned among the fundamental factors of a creative innovation environment shown in figure 4.4. The factors of funding, transfer of know how and education and R&D are provided by the roles in the resources/means field. The roles in the innovation field are performed by the innovation enterprises. The globally operating industry factor is mainly provided by the coordination roles, especially by program organizations, like Sematech and the Holst Center, operating in a global network of participating partners. Both, the coordination roles as well as the connector role take care of the cooperation, interaction and innovation culture. The trivial factor of competent labor is, or at least should be, provided by all roles. So, all fundamental factors of a creative innovation environment presented in figure 4.4 are covered by figure 4.6, indicating that the set of roles listed in table 4.1 should be adequate for the scope of this research.

4.3 Stakeholder analysis

As mentioned in the previous chapter, the major part of the research on the role of MiPlaza will be done by a stakeholder analysis. In this section a general definition of a stakeholder analysis is presented, as well as why it can be useful and which steps are taken in the analysis.

A stakeholder analysis is the process of systematically gathering and analyzing information to determine whose interests should be taken into account when developing and/or implementing a policy, project or program [Schmeer, 1999]. The aim of stakeholder analysis is to evaluate and understand stakeholders from the perspective of an organization and to determine their relevance to the policy, project or program [Brugha and Varvasovsky, 2000].

The stakeholders are persons, groups or institutions with interests in the policy, project or program being promoted or developed [Euforic, 1995; Schmeer, 1999]. Primary stakeholders, as opposed to secondary stakeholders, are those that are ultimately affected and essential to the survival and wellbeing of the organization [Euforic, 1995; Clarkson, 1995; Brugha and Varvasovsky, 2000]. According to Freeman [1984], stakeholders change over time and their stakes change depending on the strategic issue under consideration.

Mitchell, Agle and Wood [1997] stated in their extensive review research on stakeholder theory that classes of stakeholders can be identified by the possession of one or more of three relationship attributes: power, legitimacy and urgency. Power is the ability of a party to bring about the outcomes it desires [Salancik & Pfeffer, 1974] and can be categorized, based on the type of resource used to exercise it, in coercive power (based on physical resources of force, violence or restraint), utilitarian power (based on material or financial resources) and normative power (based on symbolic resources) [Etzioni, 1964]. Legitimacy is a generalized perception or assumption that the actions of an entity are desirable, proper or appropriate within some socially constructed system of norms, values, beliefs and definitions [Suchman, 1995]. Urgency is defined as the degree to which stakeholder claims call for immediate attention [Mitchell, Agle and Wood, 1997]. Figure 4.7 shows the stakeholder typology with these three attributes and the different types of stakeholders based on the attributes they possess. While Mitchell, Agle and Wood treat each attribute as “present or absent” in this three-attribute stakeholder typology, they do note that each attribute in reality operates on a continuum or series of continua. This theoretical model of stakeholder typology has later, by empirical testing, been confirmed by Agle, Mitchell and Sonnenfield [1999].

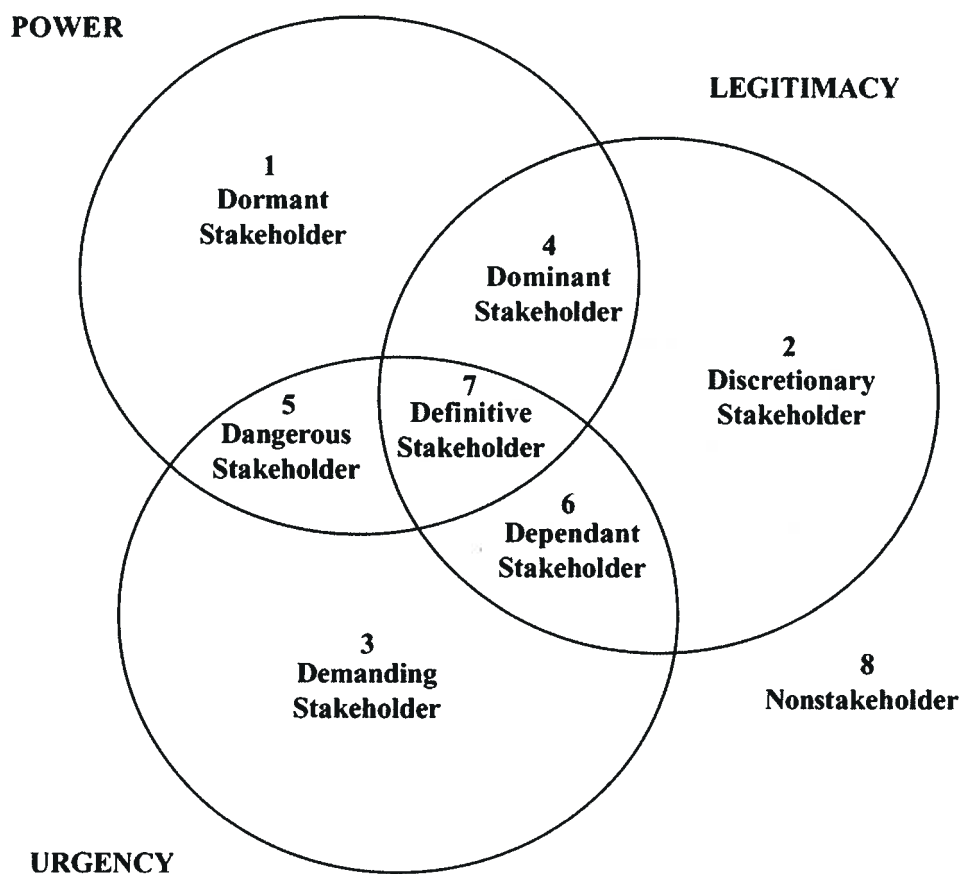


Figure 4.7: Stakeholder typology - one, two or three attributes present
[Mitchell, Agle and Wood, 1997]

Based on the typology of figure 4.7, the stakeholders can be categorized in three main levels of salience, which are latent, expectant and definitive stakeholders.

When only one of the attributes is perceived by managers to be present, those are termed latent stakeholders (areas 1, 2 and 3), stakeholder salience will be low. In case the only relevant attribute is power, it is a dormant stakeholder. This type of stakeholders possess power to impose their will on an organization, but by not having a legitimate relation or urgent claim, their power remains unused. In case of the attribute of legitimacy, it is a discretionary stakeholder. Due to absent power and urgent claims, there is no pressure on managers to engage in an active relationship with this type of stakeholders. In case the only attribute is urgent, it is a demanding stakeholder. Since this type does not possess power nor legitimacy, they are just annoying noise to management. With limited time and resources managers may well do nothing about the latent stakeholders.

When two of the attributes are perceived by managers to be present, those are termed expectant stakeholders (areas 4, 5 and 6), stakeholder salience will be moderate. In case a stakeholder is both powerful and legitimate, it is a dominant stakeholder. This type has legitimate claims on the organization as well as the ability to act on these claims and will therefore matter to managers. In case a stakeholder has a legitimate urgent claim, but lacks power, it is a dependent stakeholder, as it depends upon others for the power necessary to carry out its will. This type of stakeholders also matter to managers as they can easily become definitive stakeholders by teaming up with a powerful stakeholder. In case a stakeholder has both power and urgent claims, but lacks legitimacy, it is a dangerous stakeholder as it will be coercive and possibly violent. These stakeholders matter to managers, since a failure to identify them would result in missed opportunities for mitigating the dangers and lower levels of preparedness.

When all three attributes are perceived by managers to be present, those are termed definitive stakeholders (area 7), stakeholder salience will be high. Because a stakeholder possessing both power and legitimacy will by definition already be a member of the dominant coalition of an organization, when its claims are urgent managers have a clear mandate to give priority to those claims.

However, although groups or organizations can reliably be identified as stakeholders based on their possession of power, legitimacy and urgency in relation to the organization, in the end it is the organization's managers who determine which stakeholders are salient and therefore receive management attention during and after the stakeholder analysis.

Mitchel, Agle and Wood also note that the stakeholder attributes are variable, not steady state, and can change for any situation. Also, stakeholder attributes are a matter of multiple perceptions and are a socially constructed reality, instead of an objective one. And finally, a stakeholder may not be conscious of possessing an attribute, and if conscious, it may choose not to enact any implied behaviour.

The stakeholder analysis includes questions regarding stakeholder characteristics as knowledge of the policy, program or project, position on the topic, interests related to the topic, and influence, interrelations, networks and other characteristics of the stakeholders [Schmeer, 1999; Brugha and Varvasovsky, 2000]. Policymakers and managers can use it as a tool for identifying the optimal strategies for managing other stakeholders, identifying current and future opportunities and threats and how best to

handle them. It generates knowledge about the relevant stakeholders, to understand their behaviour, intentions, interrelations, agendas, interests, the influence or resources they could bring in to affect the decision making and the conflicts of interest between stakeholders. This allows managers to interact more effectively with key stakeholders and to increase support for the policy or program in question [Euforic, 1995; Schmeer, 1999; Varvasovszky and Burgha, 2000; Burgha and Varvasovszky, 2000].

According to Schmeer [1999] there are eight major steps in the process of a stakeholder analysis:

1. Planning the process
2. Selecting and defining a policy, project or program
3. Identifying key stakeholders
4. Adapting the analysis tools
5. Collecting and recording the information
6. Filling in the stakeholder table
7. Analyzing the stakeholder table
8. Using the information

In the next chapter, where the research methodology is discussed, these steps will be elaborated in more detail.

The three main topics discussed in this chapter – Open Innovation and innovation networks, organizational roles in innovation networks, and stakeholder analysis – together form the framework upon which this research on the role of MiPlaza within the Open Innovation R&D community is built. The stakeholder selection for the research, will be based on the three-attribute stakeholder typology of power, legitimacy and urgency, as developed by Mitchell, Agle and Wood, to select the most relevant stakeholders to be taken into account during the research. The set of major and most common organizational roles in an innovation network, as presented in this chapter - although by definition not complete but expectedly adequate for the scope of this research - will be used as guideline during the research to find the role or roles MiPlaza should best perform, while meeting both the interorganizational and the intraorganizational success factors, to be able to fulfill its customers' desires as much as possible, as well as facilitate and contribute to the general implementation of the concept of Open Innovation by Philips.

5. Research Methodology

In this chapter the toolset is developed that will be used to perform the research of the next two chapters. Although the same toolset can be used for both the stakeholder analysis as well as the comparative study, since this toolset originates from stakeholder analysis publications, the focus will be on the stakeholder analysis. Thereafter the modifications for using the tool for the comparative study are discussed.

As the first two steps in the process of a stakeholder analysis, mentioned at the end of the previous chapter, have actually already been taken during the research design in chapter 3, and the last step will be how MiPlaza uses the outcomes of this research, the actual stakeholder analysis will consist of five steps, which are described in detail below [Schmeer, 1999; Euforic, 1995; Dick, 1997; Varvasovszky and Brugha, 2000].

Step 1: Identifying key stakeholders

For the success of the analysis, the key stakeholders need to be defined. Therefore, all actors who could have an interest in MiPlaza, including actors outside the Open Innovation R&D network, should be identified. Those may be individuals (organizations) or stakeholder groups, or some combination [Dick, 1997]. Since resources and time for the analysis are limited, the list of stakeholders to be interviewed must be prioritized. Experts who know the sector and its actors can help in this process to include only those actors who have a direct interest in the policy [Schmeer, 1999]. A starting point could be to divide the list into primary and secondary stakeholders [Euforic, 1995], where the primary stakeholders are the actors which have direct contact with MiPlaza, have great influence on the role of MiPlaza and/or are to a relatively large extent influenced by the role of MiPlaza.

Step 2: Adapting the tools

To gather and analyze the information from the stakeholders, the following tools can be used: definitions of stakeholder characteristics, stakeholder table, interview questionnaire and protocol, and reference chart. These tools should be adapted to the specific research that is performed.

First the stakeholder characteristics of interest for the research should be defined. The following characteristics are usually included for each stakeholder [Schmeer, 1999; Dick, 1997] :

- I.D. number (given to the stakeholder on the questionnaire)
- Position and organization
- Internal/external: internal stakeholders work within the organization that is promoting or implementing the policy, project or program; all other stakeholders are external.
- Knowledge of policy: the level of accurate knowledge the stakeholder has regarding the policy under analysis, and how each stakeholder defines the policy in question. This is important for identifying stakeholders who oppose the policy due to misunderstandings or lack of information.

- Attitude: whether the stakeholder supports, opposes, or is neutral about the policy, which is key to establishing whether or not he or she will block the policy implementation
- Interest: the stakeholder's interest in the policy, or the advantages and disadvantages that implementation of the policy may bring to the stakeholder or his or her organization. Determining the stakeholder's vested interests helps policymakers and managers better understand his or her position and address his or her concerns.
- Alliances: organizations that collaborate to support or oppose the policy. Alliances can make a weak stakeholder stronger, or provide a way to influence several stakeholders by dealing with one key stakeholder.
- Resources: the quantity of resources - human, financial, technological, political, and other - available to the stakeholder and his or her ability to mobilize them. This is an important characteristic that is summarized by a power index and will determine the level of force with which the stakeholder might support or oppose the policy.
- Power: the ability of the stakeholder to affect the implementation of the policy.
- Leadership: the willingness to initiate, convoke, or lead an action for or against the policy. Establishing whether or not the stakeholder has leadership will help policymakers and managers target those stakeholders who will be more likely to take active steps to support or oppose the policy (and convince others to do so).

However, based on the stakeholder typology of Mitchel, Agle and Wood, as discussed in the previous chapter, next to the power characteristic, the other two attributes (legitimacy and urgency) should be taken into account as a characteristic as well. The leadership characteristic could be seen as an indicator for the likelihood of the stakeholder to become a definitive stakeholder by gaining it's missing attribute(s) through teaming up with other stakeholders.

Once the characteristics of interest have been defined, a stakeholder chart can be created with the characteristics as column headers. An example of (the header part of) such a stakeholder chart is shown in table 5.1.

| D | | E | | | F | G | H | | I | J |
|-----------|------------|-----------------|-----------------|-----------------|--------------------|-------------------------|-----------|-----------------------|-------------------|--------|
| Knowledge | | Position | | | Interests | Alliances | Resources | | Power | Leader |
| 1 | 2 | 1 Self | 2 Others | 3 Final | Advant./disadvant. | Organizations mentioned | 1 | 2 Ability to mobilize | Resources average | Yes No |
| Level | Definition | S, MS, N, MO, O | S, MS, N, MO, O | I.D. # N, MO, O | | | Quantity | 3, 2, 1 | 3, 2, 1 | |
| 3, 2, 1 | | | | | | | | | | |

Table 5.1: Example of stakeholder characteristics and table titles [Schmeer, 1999]

After the stakeholder characteristics and chart have been defined, a standard interview questionnaire should be developed which should be used by the interviewer to guide the conversation during the interview. The appropriate way of asking questions must be decided, direct or indirect, or both. The questions should be clearly stated, specific and as much as possible open ended to invite the stakeholder to reply more than just a simple "yes" or "no" answer. The questionnaire should include an introductory section and specific concepts and definitions in the questionnaire should be explained to the stakeholder if necessary [Schmeer, 1999]. As stakeholders are interviewed sequentially, a more complete and potentially complex picture emerges, so the questionnaire might need to be modified or updated and earlier stakeholders revisited to clarify earlier answers or ask additional questions [Varvasovsky and Brugha, 2000].

Also, an interview protocol needs to be defined which should be followed during the interviews. This protocol is a set of "rules" aimed to ensure the collection of consistent and accurate data. Such rules could for example be that questions should not be asked more than twice, notes should be worked out directly after the interview,

the information should be entered in the same words the stakeholder used, etc [Schmeer, 1999]. The protocol should be established in advance.

The final tool is the Information Transfer Reference Chart (short: reference chart), which serves the purpose of providing a means of checking that all stakeholder characteristics are covered in the interview questionnaire and transferring the information from the questionnaire to the stakeholder chart. The reference chart should be developed *after* the interview questionnaire and the stakeholder chart, as it incorporates specific interview questions and the column titles used in the stakeholder chart [Schmeer, 1999]. The reference chart is created by writing the question numbers of the questionnaire into the columns of the stakeholder chart corresponding with the information the specific question provides. Table 5.2 shows an example of a reference chart based on the stakeholder chart of table 5.1.

| C Intern/ Extern I E | D Knowledge | | E Position | | | | F Interests | G Alliances | H Resources | |
|-----------------------------------|--------------------|---------------|--------------------|--|--------------------|-----------|--|----------------------------|------------------------|-----------------------------------|
| | 1 Level 1, 2, 3 | 2. Definition | 1. Self | | 2. Others | | Advant./ Disadvant. | Organizations mentioned | 1. Quantity 3, 2, 1 | 2. Ability mobilize 3, 2, 1 |
| | | | S, MS, N, MO, O | | S, MS, N, MO, O | I.D. # | | | | |
| According to their position | #1 | #3 | #6 | | #13 | | #4 | #8c | #8a | #8a |
| | #2 | | #7 | | #14 | | #5 | #8e | #8f | #8b |
| | #3 | | #8 | | #15 | | #7 | #8g | or | #8c |
| | | | #9 | | #16 | | #9 | or | #11a | #8d |
| | | | or | | | | | #11c | #11f | or |
| | | | #6 | | | | #4 | #11e | | #11a |
| | | | #10 | | | | Interests info. for strength of position | #11g | | #11b |
| | | | #11 | | | | #5 | | | #11c |
| | | | #12 | | | | #10 | | | #11d |
| | | | | | | | #12 | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

Table 5.2: Example of a reference chart [Schmeer, 1999]

Step 3: Collecting and recording the information

To begin the interview process, appointments should be made with each stakeholder. These appointments should ideally be made about one or two weeks in advance. If necessary, assistance from the research sponsor should be sought to secure appointments. The interviews should be scheduled at the time and place most convenient for the stakeholder [Schmeer, 1999].

During the interviews, the protocols established before should be followed. If the stakeholder does not understand a question, it can be rephrased slightly, but any deviations from the original questionnaire should be noted [Schmeer, 1999].

Any tape-recording of the interviews may be negotiated at the beginning. It is also advisable to reach agreement about anonymity, confidentiality, attributions of opinions and how the information can be used. This may, however, be postponed till the end of the interview when a measure of openness and trust has been established [Varvasovszky and Burgha, 2000].

Immediately after the interview, the stakeholder's answers to the questionnaire should be entered into a computer. A separate electronic file should be created for each stakeholder that contains the questionnaire and his or her answer to each question. These answers should be recorded as literally as possible, without summarizing what the stakeholder was "trying" to say. The objective of this follow-up process is to record the information accurately, legibly, and by question number for use in the analysis process. [Schmeer, 1999]

Step 4: Filling in the stakeholder chart

After the interviews, the detailed and often lengthy answers from the interviews have to be arranged into a more concise and systematized format. Clear comparisons can then eventually be developed among the different stakeholders. To make such comparisons and analyses, the interview responses must be translated into the stakeholder chart first. Accurately transferring interview responses to the chart requires the use of all of the tools developed: the completed transcripts of each stakeholder interview, the reference chart, the characteristics definitions, and the stakeholder table. During the process of adapting the tool, an explanation of how to fill in the stakeholder table should be included for each definition. [Schmeer, 1999]

Whereas a stakeholder's attitude usually can be defined on a scale from supporter to opponent, in the case of research on the role of MiPlaza there is no real supportive or opposing outcome, but a role suggestion instead. However, since it might be possible some stakeholders oppose the idea of MiPlaza playing a specific role, it would be wise to take such opinions into the chart as well, next to the suggested role(s).

The attitude of a stakeholder can be determined by the information directly reported by the stakeholder during the interview, by indirect information through other stakeholders and by interest information [Schmeer,1999]. In the case of MiPlaza, a possible role might for example be defined by the interest information about what aspects or activities of MiPlaza are valued by the stakeholder.

According to Schmeer, the resources and power characteristic columns are filled in based on a 1-2-3 scale. In the quantity of resources, 1 stands for 'few', 2 stands for 'some' and 3 stands for 'many' resources. The power index is the average of the quantity of resources and the ability of the stakeholder to mobilize them. However, since the stakeholder typology of Mitchell, Agle and Wood treats the attributes more in a absent-present way, this would be difficult to match. Therefore the scale will be extended to a 1-to-4 scale, where 1 stands for no power, 2 stands for low power, 3 stands for moderate power and 4 is high power. To ease the calculation, the same scale will be used for the resources characteristic. The lowest two scales will be treated as 'absent', while the highest two are treated as 'present'. The legitimacy and urgency attributes are also added, using the same numerical classification as the power attribute, to allow for stakeholder type determination.

Step 5: Analyzing the stakeholder chart

After completing the stakeholder chart, the information needs to be analyzed. This analysis should focus on comparing information and developing conclusions about the stakeholders' relative importance, knowledge, interests and positions. From the information in the stakeholder table, it should be possible to conclude the following [Schmeer, 1999]:

- Who are the most important stakeholders?
- What is the stakeholders' knowledge of the topic?
- What are the stakeholders' positions on the specific topic?
- What do the stakeholders see as possible advantages/opportunities or disadvantages/threats (interest analysis)?

To determine which stakeholders are the most important, the stakeholders will be grouped in the stakeholder typology by Mitchell, Agle and Wood as presented in

figure 4.7. The highest importance will be assigned to the definitive stakeholders, medium importance will be assigned to dependent, dangerous and dominant stakeholders, and the lowest importance to demanding, discretionary and dormant stakeholders.

The level of knowledge related to the topic is often of interest to policymakers and managers [Schmeer, 1999]. It can be presented as a general conclusion, especially if it is similar for the majority of the stakeholders, or the stakeholders can be divided by their level of knowledge (1, 2, or 3), which is useful for targeting a communication strategy.

In analyzing the position information, the following aspects can be determined [Schmeer, 1999]:

- Total number of supporters/opponents
- Importance of supporters/opponents (cross-reference with power/leadership analysis)
- Knowledge of supporters/opponents (cross-reference with knowledge data)
- Advantages and disadvantages of policy implementation to the supporters/opponents (cross-reference with interest data)
- Knowledge of whether these supporters/opponents are internal or external to the organization developing the policy (cross-reference with the internal/external classification)
- Support "clusters": stakeholders in the same sector who support the policy (cross-reference with organization information)
- Neutral stakeholders, their importance, knowledge, and interests

However, since this research focuses on which role MiPlaza should play, the setup of supporters and opponents for a specific policy does not apply well, therefore aspects to be determined in this research will be:

- Total numbers of suggested roles per role
- Importance of suggesting stakeholder (cross-reference with power/leadership analysis)
- Knowledge of suggesting stakeholder (cross-reference with knowledge data)
- Opportunities and threats of specific roles for MiPlaza stakeholders (cross-reference with interest data)
- Knowledge of whether roles are suggested by stakeholders internal or external to MiPlaza (cross-reference with the internal/external classification)
- Position "clusters": stakeholders in the same sector who suggest the same role(s) (cross-reference with organization information)
- Neutral stakeholders (no preferred role), their importance, knowledge, and interests

In cross-referencing the interest data with the position data, the opportunities and threats identified by the stakeholders can be used to explain their positions or to emphasize their knowledge of the topic (i.e., irrelevant opportunities and threats may represent a misunderstanding of the topic). The interest data by itself can be presented as a list of recommendations. This is most useful if many stakeholders identify the same opportunities and especially threats, so the concerns of the majority of the stakeholders regarding the topic can be identified.

Additional to the information listed on the stakeholder chart, other information gained from the interviews may be used as well to develop key results and conclusions [Schmeer, 1999]. When transferring the information from the questionnaires to the chart, the following possibly relevant information should be noted:

- Suggestions for the implementation of a specific role of MiPlaza
- Any expectations that the majority of the stakeholders have in relation to MiPlaza

By analyzing information related to these areas, as well as the four basic analysis results previously mentioned, a list of conclusions or results can be developed to be presented to the management of MiPlaza.

In the next chapter, the method for performing a stakeholder analysis will be used for the analysis of MiPlaza's stakeholders regarding their positions on MiPlaza's role in their R&D community. For the comparative study among organizations similar to MiPlaza in the chapter thereafter, the same tools can be used. However, in that case the characteristics will be determined by the topics of interest based on the outcomes of the stakeholder analysis. At least one of the characteristics is the role (or roles) the similar organizations perform in their community, other characteristics could be topics like how those organizations deal with specific issues or concerns raised by MiPlaza's stakeholders.

6. Stakeholder Analysis

In this chapter a stakeholder analyses is performed to seek an answer to the first sub question mentioned in paragraph 3.3 of which role(s) in the innovation process MiPlaza should perform according to its stakeholders. In the first paragraph the stakeholders to be included in the research are selected. In the second paragraph the survey is set up, of which the results are then analyzed in the third paragraph and followed by the conclusions of the stakeholder analysis in the last paragraph.

6.1 Stakeholder selection

Initial start for identifying and making up a list of MiPlaza's stakeholders was the stakeholder overview presented by MiPlaza business development as shown in figure 6.1. This overview indicates some different kinds of stakeholders MiPlaza has to deal with, like small start-up companies, large corporate organizations, equipment providers and research institutes.

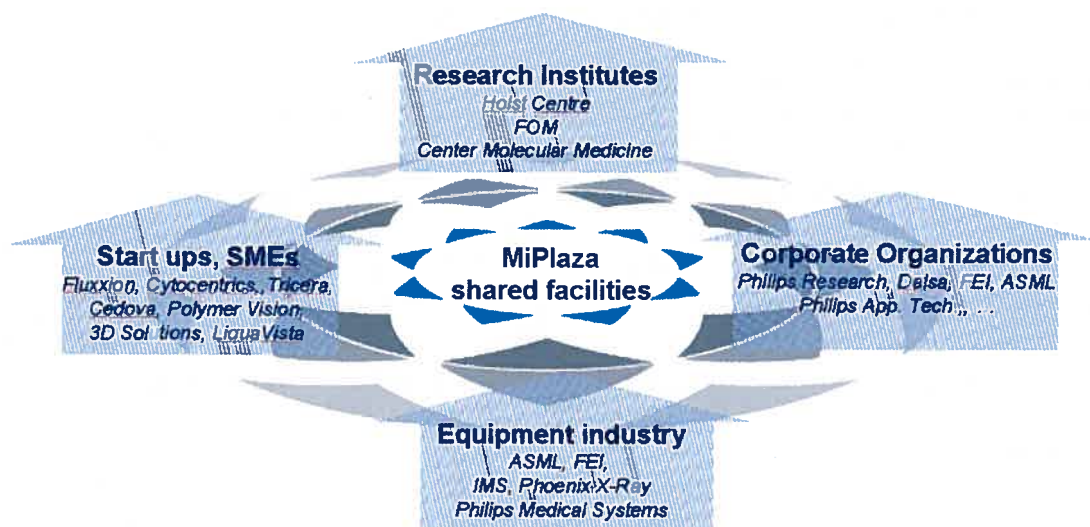


Figure 6.1: MiPlaza business development's view on its stakeholders

Although the overview of figure 6.1 already lists a lot of individual organizational stakeholders, they are only (potential) customers and partners. Missing in this overview are MiPlaza's internal stakeholders and environmental stakeholders.

MiPlaza's internal stakeholders are the departments of O&E that participate in MiPlaza (see paragraph 2.4), MiPlaza business development, and the employees working for MiPlaza.

The environmental stakeholders can be split into two subgroups, primary and secondary stakeholders. The primary environmental stakeholders are stakeholders close to MiPlaza with a high level of mutual affection. These stakeholders are in the

expectant and definitive stakeholder groups of the stakeholder typology by Mitchell, Agle and Wood (see paragraph 4.3). An example of an environmental stakeholder that fits this primary stakeholders group is the High Tech Campus, as MiPlaza is located on the HTC and to a large extent depends on its facilities and infrastructure, whereas the HTC is affected by the role of MiPlaza as significant selling point for potential new HTC residents. The mutual affection with secondary environmental stakeholders is much lower, if not absent at all. This group is pictured as the latent stakeholders by Mitchell, Agle and Wood. Examples of such environmental stakeholders are local and national governments. Whereas MiPlaza might be able to affect local government decision to a small extent, it has practically no power to affect the national government, but both kinds of government organizations can have influence on MiPlaza by for example subsidies and legislation. However, although these stakeholders do have power, they have both low legitimacy in MiPlaza regarding the role it performs in the R&D community as well as no urgency at all, defining them as latent stakeholders in this research.

The equipment suppliers as depicted in figure 6.1 are MiPlaza's potential partners. These are the manufacturers of the equipment used within MiPlaza for the research and development activities. Most potential as partner are those manufacturers that have significant benefit of MiPlaza's services for their own research and development programs. These are considered to be definitive stakeholders, since their claims are relatively urgent for their own R&D, they also possess legitimacy due to partnership and have power by supplying essential equipment to MiPlaza.

Because of time and resource limitations, not all stakeholders were to be interviewed, but only the ones with high enough salience, i.e. the by MiPlaza business development perceived expectant and definitive stakeholders. So, in cooperation with MiPlaza business development a list of priority stakeholders was selected.

The high salient internal stakeholders are the MiPlaza management, as well as the three departments of O&E that form MiPlaza (figure 2.7).

The (potential) customers that are listed are all stakeholders that MiPlaza was in active relationship with around the start of research, having these stakeholders possess the attribute of legitimacy as well as at least a moderate level of urgency. Therefore, despite the power level of the (potential) customers, they are already at least of moderate salience.

Two (potential) partners of MiPlaza were of enough salience to be included in the research. Other potential partners MiPlaza was not in active enough relationship with to have them possess at least moderate levels of legitimacy or urgency. With only the power attribute, those were dormant stakeholders, and as part of the latent stakeholders group excluded from this research.

Similarly, in the environmental stakeholders group, the only stakeholder with high enough salience was the High Tech Campus (as discussed above), all other environmental stakeholders were not considered to possess descent levels of at least two of the three attributes, therefore being latent stakeholders and excluded from the research.

6.2 Survey setup

To setup the survey, first the stakeholder characteristics of interest were defined. As a start, the stakeholder characteristics list of step 2 in chapter 5 was used as basis, which was then modified and fine-tuned to fit this research.

The level of knowledge was to be measured on two subjects, about Open Innovation and about MiPlaza. The level of accurate knowledge the stakeholder has regarding Open Innovation was important for identifying stakeholders who might provide inapplicable suggestions due to misunderstandings and/or lack of information, and the level of accurate knowledge the stakeholder has about MiPlaza is important for identifying stakeholders who might suggest inapplicable suggestions or motivations due to misunderstandings of the concept of MiPlaza.

Another modification to the list was the change of attitude (which focuses on supporters and opponents) to the perception of MiPlaza's current role(s) and the suggested role(s) the stakeholders would like to see MiPlaza perform. The stakeholder's perception of MiPlaza's current role could also be important for identifying stakeholders who might give inapplicable suggestions or motivations due to misunderstanding and/or lack of information, but it's interesting to get an idea on the general perception of MiPlaza's role as well. The stakeholder's suggestion regarding the role it would like to see MiPlaza perform is the main goal of this research and it's importance is equivalent to the attitude characteristic in most stakeholder analyses.

Where the interest characteristic in a policy supporter/opponent stakeholder analyses focuses on the advantages or disadvantages of a policy to the stakeholder, the characteristic focuses here on determining the positive aspects and advantages stakeholders identify in the concept of MiPlaza and the concerns they might have.

The alliances and leadership characteristics were not used as these implicitly focus on the concept of supporters and opponents to a specific policy or programs, which are not applicable to the open question character of the research on the role of MiPlaza.

So, the list of stakeholder characteristics was defined as:

- I.D. number
- Organization
- Position of the interviewee in the organization
- Internal/external
- Knowledge: level of knowledge about both Open Innovation and MiPlaza
- Perception of MiPlaza's current role(s)
- Suggestion which role(s) MiPlaza should perform
- Interests: positive aspects and concerns
- Resources: quantity and ability to mobilize them
- Power (average of resources quantity and ability to mobilize them)
- Legitimacy
- Urgency
- Stakeholder type (based on level of presence of power, legitimacy and urgency)

Table 6.1 shows the stakeholder chart where the stakeholder characteristics mentioned above are used as column headers.

| A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P |
|----|--------------|-------------------------|-----------------------|-------------------------------|--------------------|------------------------|------------------------|---------------------|----------|-----------------------|-------------------------------------|-----------------------------------|------------|-----------|---------------------|
| ID | Organization | Position Interviewee | Internal/ External | Knowledge | | Current role | Role suggestion | Interests | | Resources | | Power | Legitimacy | Urgency | Stakeholder type |
| | | | | Open Innovation [3,2,1] | MiPlaza [3,2,1] | [mentioned role(s)] | [mentioned role(s)] | Positive aspects | Concerns | Quantity [4,3,2,1] | Ability to mobilize [4,3,2,1] | Resources average [4,3,2,1] | [4,3,2,1] | [4,3,2,1] | |

Table 6.1: Stakeholder chart

The interview surveys consisted of four parts. The first part was a general introduction about the purpose of the research. The second part started with some introductory questions regarding the stakeholder organization and the interviewee, to go to the main survey questions in the third part about the role of MiPlaza and the stakeholder interests. The final part contained round off and closing questions.

In the general introduction first some information was provided to the interviewee regarding the background and the purpose of the research, after which the interviewee was assured his/her feedback will be processed confidentially.

In the introductory questions first the position of the interviewee in his/her organization was determined. Then the knowledge level of the interviewee about Open Innovation and his/her interpretation were analyzed. This interpretation did not necessarily be in correspondence with the official concept of Open Innovation as described by Chesbrough [2003a]. In case the knowledge level about Open Innovation was low or even absent, or the interpretation did not correspond well, an explanation would be given about the concept of Open Innovation as defined by Chesbrough. Then the question if and how the stakeholder already deals with Open Innovation would be asked, followed by a question to determine the level of knowledge about MiPlaza.

The main questions focused on which role the stakeholders consider MiPlaza currently performing and which role they would suggest MiPlaza to perform. Also the interest characteristics were analyzed in this section of the interview as questions were asked regarding the perceived positive aspects of the concept of MiPlaza for the stakeholder, and how to increase them, as well as the concerns the stakeholders still might have and their positions on how to deal with those. In the case a stakeholder could not provide a clear suggestion for or opinion about MiPlaza's future role(s), the advantages the stakeholder identifies in the concept of MiPlaza could be used to indicate a possible role, whereas concerns or issues could indicate roles MiPlaza should better not perform or points of attention for MiPlaza to pay more attention to.

The roles were to be filled in based on the roles listed in table 4.1, as most roles can be renamed to one of these roles (as mentioned in the role descriptions in paragraph 4.2, there could be multiple names for the same role) or could be a combination of several of these roles. However, it might have been possible that a role got mentioned by a stakeholder which was not in the model, since it was emphasized that listing all possible roles is impossible and only the most common ones were included. In that case, the mentioned role would be filled in and noted as addition to the list of table 4.1, as that role seemed important enough for the stakeholder to mention.

The closing questions were whether something has not been mentioned yet but the interviewee would like to mention or discuss and whether the interviewee could suggest other persons or stakeholders which could be interesting to interview as well for this research.

The final questionnaire was fine-tuned with MiPlaza business development before the start of the interviews and is listed in appendix A.1.

To ensure the collection of consistent and accurate data, the following interview protocol was developed:

- If allowed by the interviewee, the interview is recorded on minidisk
- In case minidisk recording is not allowed, notes are taken during the interview
- Questions should be asked no more than twice; if the interviewee still does not provide an answer, the interviewer should move on
- The interview should be terminated at the interviewee's request, even if questions remain
- The interviewer should try to finish the interview within one hour, but should under no circumstances exceed two hours
- After the interview the complete minidisk recording should be worked out on a computer
- In case notes were taken instead of a minidisk recording, they should be filled out into one electronic questionnaire per stakeholder immediately after the interview
- The worked out interviews should be in the same words the interviewee used

By writing the question numbers of the survey as listed in appendix A.1 in the corresponding columns of the stakeholder chart of table 6.1, the information transfer reference chart shown in table 6.2 was developed.

| C | D | E | F | G | H | I | J | K | L | M | N | O | P |
|-------------------------|-----------------------|-------------------------------|--------------------|------------------------|------------------------|---------------------|----------|-----------------------|-------------------------------------|-----------------------------------|------------|-----------|---------------------|
| Position Interviewee | Internal/ External | Knowledge | | Current role | Role suggestion | Interests | | Resources | | Power | Legitimacy | Urgency | Stakeholder type |
| | | Open Innovation [3,2,1] | MiPlaza [3,2,1] | [mentioned role(s)] | [mentioned role(s)] | Positive aspects | Concerns | Quantity [4,3,2,1] | Ability to mobilize [4,3,2,1] | Resources average [4,3,2,1] | [4,3,2,1] | [4,3,2,1] | |
| #1 | #1 | #2 | #4 | #5 | #6 | #7 | #10 | #1 | #1 | col.K | #5 | #5 | col.M |
| | | #3 | #5 | #6 | | #8 | #11 | | #3 | col.L | | #10 | col.N |
| | | | #12 | | | #9 | #12 | | | | | #13 | col.O |
| | | | | | | #13 | #13 | | | | | | |

Table 6.2: Information transfer reference chart

6.3 Survey analysis

After all interviews were performed and the recordings and notes worked out in interview transcripts, which are listed in appendix B, the results based on the answers to the survey questions were used to fill in the stakeholder chart. However, due to the high level of detail and confidentiality, this stakeholder chart is not presented in this public version of the report.

The assigned levels of resources were determined based on the information from the interviews as well as background information like online publications about the organizations concerned. The power attribute level was then calculated by averaging the levels of resources quantity and ability to mobilize them. The legitimacy and urgency levels were mainly determined by the information provided by the stakeholders during the interviews. As mentioned in chapter 5, a level of 3 or 4 has the attribute considered as present, whereas a level of 1 or 2 has it considered to be

absent. Based on presence of the power, legitimacy and urgency attributes, the 'stakeholder type' column then identifies the most important stakeholders, which are the definitive stakeholders. Those stakeholders are two of MiPlaza's customers, both interviewed partner organizations, the High Tech Campus and of course the Operations & Engineering department of Philips Research Eindhoven where MiPlaza came in to existence. Therefore the position regarding MiPlaza's role as well as the interests of these organizations will have a stronger weight in the role suggestion determination of this research.

The level of knowledge regarding Open Innovation, more or less the foundation of the concept of MiPlaza, seemed to be quite diverse among MiPlaza's stakeholders. Where some of them had heard about the concept of Open Innovation, and some even had read Chesbrough's book [2003a], some others heard the term for the first time during the interview. Although this could indicate that some more attention might need to be paid on explaining this basic idea behind the concept of MiPlaza to its stakeholders, no clear correlation is identified in the analysis results between the level of knowledge about Open Innovation and the role suggestions for MiPlaza or the interests of the stakeholders.

In contrast to the diverse level of knowledge about the concept of Open Innovation, most of the investigated organizations have a good idea about what MiPlaza currently is and what it can offer to its customers. Only two organizations - both customers and markedly both divisions of Philips - admitted they still didn't understand quite well what MiPlaza exactly is or is supposed to be. Although this could originate from confusion by knowing a little more than the other customers about the background and history of MiPlaza as Philips cleanroom facilities, while not being close enough (in contrast to e.g. PRE O&E) to have been able to keep track of all organizational developments regarding those facilities – both divisions were not located at the High Tech Campus – it makes at least clear that presentation of the concept of MiPlaza to its customers and potential customers still needs some extra attention. Nonetheless, the two organizations with less knowledge about the concept of MiPlaza still identified the current role of MiPlaza as the same role as identified by the other stakeholders, indicating that their perceptions of MiPlaza were in line with the other stakeholders, but they were less confident their perceptions were correct due to lack of clarity regarding the concept of MiPlaza.

Practically all interviewed stakeholders - fourteen out of fifteen - identified the current role of MiPlaza as mainly being a facilitator. The role of facilitator was not always considered being of similar broadness, as some stakeholders thought of it as only providing the cleanroom facilities, while others also included facilities like housing, telephone and network connections, etc. Since housing, and therewith also the communication connections, is actually more the responsibility of the High Tech Campus, which was also mentioned by one of the customer definitive stakeholders, this is already one of the items which indicate that the distinction between the concept of MiPlaza and that of the High Tech Campus is not completely clear for all stakeholders.

All stakeholders that identified the current role as facilitator, also considered this role to be the primary desired role. Most of the interviewed stakeholders mentioned this role explicitly when asked about their views on MiPlaza's future roles, while a few mentioned it implicitly as they identified the other roles they mentioned as additional

roles. Where most stakeholders described the facilitator role as facilitating the cleanroom space and equipment for research and development, one customer explicitly mentioned the desire for having the possibilities of running small-batch productions, especially for the techno-startups, to be able to make for example the first few hundreds of a product for tryout. Of course, when the necessary batches start becoming medium or large amount productions, the production should be transferred to specialized production facilities. Also, these small-batch productions should not take up too much availability of the installed machinery, as that would decrease the toolbox function of MiPlaza, as described by one of the internal stakeholders, which means that the advantage of MiPlaza should be that any tool is available when it is needed, or at least with short waiting time, to optimize the innovative research and development.

Only one stakeholder did not identify the facilitator role, but instead called MiPlaza to be a marketing tool which is supposed to capitalize the services and facilities of Philips Research Eindhoven by sharing it with other parties. In one way by attracting other organizations to settle on the campus as well and in another way by sharing the operating costs. This 'role' of marketing tool was also additionally mentioned by another stakeholder. However, due to the nature of the relation between the two stakeholders, it could be possible that one has influenced the other regarding this position on MiPlaza's current role. Nevertheless, they both mentioned it as their current view on the role of MiPlaza.

Another role that has additionally been named as one of MiPlaza's current roles twice, is the role of librarian, or better, knowledge center. Although only two stakeholders mentioned this as current role, several others mentioned it as a role suggestion. One third of the interviewed stakeholders thought MiPlaza should act as a knowledge center, where MiPlaza's customers or concept participants can find a lot of detailed knowledge, not only about the use of the cleanroom equipment, but also about processes and other potentially valuable information or knowledge for their own research and development.

Other roles that have been named as current roles were co-developer, or co-inventor in IBM Business Consulting Services' terminology [IBM, 2004], test center and prototyper.

Besides the current roles of facilitator and librarian, which scored highest among the suggested roles as can be seen in table 6.3, another role scored high as well. The engineering office, a special variant of a professional services provider, was mentioned by four stakeholders. In this role, MiPlaza would not only offer its facilities to its customers, but also its knowledge and expertise in a way that (potential) customers can come to MiPlaza with an idea or a problem, which then is made, developed or solved by MiPlaza's engineers. As noted by one of the customers, MiPlaza has a large pool of (Philips) engineers, knowledge and expertise, which could possibly be positioned somewhere else on a temporary base, so outside the physical location of MiPlaza, and return to MiPlaza after the external project is finished, whereas one of the internal stakeholders sees opportunities for MiPlaza to perform this role in helping equipment manufacturers, the partners, with developing their products by tackling problems or producing small batches of specific high-tech parts on a project base.

However, when performing the role of facilitator and librarian together, by offering the facilities and equipment as well as the knowledge and expertise of MiPlaza's

employees, the technical professional services provider role is performed automatically in a way that allows or requires high customer involvement, as those customers can do a lot by themselves using the facilities and equipment while being guided and supported by MiPlaza's knowledge and expertise. This applies to the engineering office, as well as the test center and analytical research center. The higher customer involvement is beneficial for the Open Innovation concept due to the resulting higher levels of knowledge transfer as well as easier contact with and awareness of each other's intellectual properties, which in turn increases the opportunities for licensing and co-development among MiPlaza and its customers.

Not only the technical variants of the professional services provider role were mentioned by stakeholders, but non-technical professional services were desired by three of them as well, like in the fields of intellectual property, legal and consultancy. One of these three stakeholders even mentioned professional services in general, indicating the whole broad scale of both technical and non-technical services.

Another non-technical role was also mentioned by some stakeholders. According to one of the customers, and backed by another, the concept of MiPlaza performing a facilitator role is good, however there should also be something to help high-tech startups find financing, indicating the role of scrounger. Interesting to notice is that these stakeholders suggesting this role both are small techno-startups, and, as shown in figure 4.4, funding is one of the fundamental factors of a creative innovation environment.

A more broad role of helping startup organizations could be a role of incubator, as suggested by one of the partners. This brings the total amount of stakeholders suggesting a non-technical role besides MiPlaza's technical role up to six, which is more than the total amount of stakeholders suggesting the librarian role. This means that the stakeholder's wish for non-technical support actually takes the second place on the role suggestions list.

| <i>role</i> | <i>amount</i> | <i>not:</i> | <i>role</i> | <i>amount</i> |
|-----------------------------------|---------------|-------------|----------------------|---------------|
| facilitator (explicite/implicite) | 11/14 | | program insitution | 1 |
| librarian | 5 | | center of excellence | 1 |
| engineering office | 4 | | | |
| professional services provider | 3 | | | |
| scrounger | 2 | | | |
| connector | 2 | | | |
| program insitution | 2 | | | |
| test center | 1 | | | |
| incubator | 1 | | | |
| analytical research center | 1 | | | |

Table 6.3: Total stakeholder amounts of suggested and dissuaded roles for MiPlaza.

However, during the interviews it seemed that there was more a general desire for non-technical support to be available than that it had to be offered directly by MiPlaza. Therefore, if MiPlaza would perform the role of connector well, it might fulfill the demands of its stakeholders for non-technical support by connecting them to other parties that can offer these services and support, for example consultancy

organizations, venture capitalists, intellectual property specialists (e.g. Philips IP&S), etc.

The connector role was also suggested by two stakeholders in a technical sense, where MiPlaza brings its customers and partners in contact with each other. In that way cross-pollination of ideas could be facilitated. One of the partners indicated that the connection between equipment suppliers and MiPlaza's customers at MiPlaza offers opportunities for both sides, as the customers have access to better expertise regarding the use of the equipment, while the equipment manufacturers can get information about the market and customer usage issues easier. So, the role of connector could in a technical way support the cross-pollination of ideas as well as making available better expertise on the usage of the equipment and improving development of the equipment by facilitating usage feedback for the manufacturers, while at the same time fulfilling the needs for non-technical support and services by bringing the stakeholders in contact with parties that can offer these.

In contrast to all other stakeholders, one of the definitive stakeholders did not actually mention new role suggestions besides MiPlaza's current role of facilitator, but it explicitly mentioned which roles *not* to perform. It strongly dissuades MiPlaza to perform the roles of program institution and center of excellence, because in that case MiPlaza would not only become a competitor of this stakeholder, but a competitor of other large customers of MiPlaza as well.

Opposite to the strong advice not to perform the program institution role, two other stakeholders mentioned this role as suggestion. However, in this case as well MiPlaza could use the connector role to connect its stakeholders that wish for programs to participate in to the program institutions that are already operating in the Eindhoven region R&D community.

In summary, the top three of role suggestions for MiPlaza by its stakeholders would be the facilitator role in the first place, and additionally the role of knowledge center, or librarian, as well as the role of connector to bring MiPlaza's stakeholders in contact with each other for technical advantage as well as with other parties for non-technical support and services. With the connector role, MiPlaza can connect its stakeholders to all the fundamental factors of a creative innovation environment shown in figure 4.4, of which some can be provided by MiPlaza itself, like competent labor and transfer of know-how, while others can be provided by external parties, like funding and business services.

The positive aspects mentioned by the stakeholders also underpin the roles of facilitator and librarian, as the most named aspects were the variety of available equipment and technologies as well as the presence of a lot of knowledge and broad range of expertise.

Opposing the positive aspects, the stakeholders also mentioned their concerns regarding MiPlaza. In table 6.4 these concerns are listed together with the total amount of stakeholders mentioning each concern. These concerns are considered to be obstacles in the process of adopting or properly performing the desired role(s). Only the concerns that were mentioned by at least two stakeholders will be discussed further.

| <i>concern</i> | <i>amount</i> |
|--|---------------|
| no clear identity | 8 |
| IP | 8 |
| price (too) high | 5 |
| legal identity | 2 |
| no clear cost structure | 2 |
| too much 'research'-attitude | 2 |
| no investors for startups | 1 |
| no preventive maintenance | 1 |
| contracts take to long | 1 |
| accomodation for customers | 1 |
| MiPlaza is not well known yet | 1 |
| how to deal with SMB's? | 1 |
| what to do with the government's knowledge vouchers? | 1 |
| knowledge network has not taken shape yet | 1 |
| change in organizational structure needs time | 1 |
| enough customer base? | 1 |
| not enough commercial mindset | 1 |
| PR too technical | 1 |
| concepts of MiPlaza and HTC must not interfere | 1 |
| future cashflow and maintanance responsibility | 1 |

Table 6.4: Total stakeholder amounts of concerns

In figure 4.5 it was shown that one of the fundamental factors of an actor in an innovation network is a clear identity. However, that seemed to be the number one issue according to the stakeholders with respect to MiPlaza. More than half of the interviewed stakeholders mentioned as (one of) their concerns regarding MiPlaza that it had no clear identity. The stakeholders had an idea about which role MiPlaza was performing, but it was less clear what MiPlaza itself was.

One of the partners mentioned that if one searched for the *www.miplaza.com* website, some sub-website of Philips was presented. It was suggested that MiPlaza should present itself with a more clear identity of its own and not hide on a website of Philips.

In figure 6.2 the website of MiPlaza is shown as it still appeared online during the presentation of the findings of this research in March 2006. This clearly fully leans on the web pages of Philips, as that is the only name that shows up in the header part of the site. In contrast, on the website of MESA+ at the Twente University the name of the university is only mentioned on the side, while the header part of the website only shows the name of MESA+ (figure 6.3a). The website of ATDF, the cleanroom facilities at Sematech, even solely shows its own name on the site (figure 6.3b).

However, by the date of finalizing this report the website of MiPlaza shows already a clear identity of its own, as can be seen in figure 6.4, proving that progress has been made on the identity issue.

Related to the clear identity of MiPlaza is its legal identity, which is mentioned by two stakeholders. This legal identity indicates whether MiPlaza is a part of Philips, or an independent organization, or some other legal construction. According to one of the stakeholders, the lack of clarity regarding the legal status of MiPlaza institutes the vagueness regarding MiPlaza's identity in general. However, it seemed that for most

stakeholders it was more important for MiPlaza to have a clear identity than what legal identity it exactly has, although the High Tech Campus has a clear preference for MiPlaza to be a neutral and independent facility.

Whether MiPlaza is part of Philips or independent, both have advantages and disadvantages. When MiPlaza is independent, it might be able to attract new customers that were previously scared away by Philips as they are afraid of ideas and/or innovations leaking to and taken over by Philips. While on the other hand, as being a part of Philips it might attract new customers that would love to embrace the high level of knowledge and expertise Philips stands for. So, in general, the exact legal identity does not matter to much, but for MiPlaza to at least have a clear identity is essential.

Another top issue regarding the concerns of MiPlaza's stakeholders was intellectual property (IP) and confidentiality. As still being new to the concept of Open Innovation, most stakeholders still had to get used to the idea of sharing knowledge and ideas with others. One of the customers stated that rules of the game have to be defined about how IP aspects are going to be dealt with. Another desired an IP arrangement that is sufficient for at least half of all cases, because doing everything from the start all over again for every new cooperation will be a serious problem. MiPlaza could define an IP framework, which it then should present as the default way of working together with a track record of success stories. These success stories are essential to persuade organizations to cooperate in Open Innovation networks, according to several stakeholders. Also the use of multiple IP models was suggested, for example a selection of three models, to better fit each new specific cooperation.

Also one of the customer stakeholders clarified the need for confidentiality by stating that their customers would not like others to see that they have some of their products made by this stakeholder. There must be good procedures about how to deal with confidentiality, so that, for example, no papers are lying around with customer names on it. Another customer stakeholder mentions that their own employees know exactly what they can tell and what not, but people around them are aware of that only to a smaller extent, while knowledge is volatile, meaning that it can very easily be picked up and used by others.

After the top concerns of a clear identity and IP, one third of the stakeholders mentioned the high costs of MiPlaza as a concern. All these stakeholders are part of the customer group, but interesting to notice is that all small startups had this concern. The only non-startup stakeholder mentioning this concern considered the housing costs to be high in comparison with the costs of office space they were used to, whereas the startups mainly focused on the costs of the MiPlaza cleanroom facilities. Related to the costs is a concern that was mentioned by two stakeholders, both start-up customers, that there was no clear cost structure. One of them liked to know in more detail what they were paying for. In MiPlaza there are investments made for general usage, but there might be some investments made for very specific customers as well. They would not like to have to pay for these specific investments for others. Also for the other it was not clear who is paying for what.



Figure 6.2: Website of MiPlaza on March 14th, 2006



a



b

Figure 6.3: Websites of Mesa+ (a) and ATDF (b) on March 14th, 2006



Figure 6.4: Website of MiPlaza on June 15th, 2008

The last concern mentioned by at least two stakeholders is the level of ‘research’-attitude. While performing its role as facilitator, there is still too much of an attitude like “if it can’t be done today, next month will also be okay”, while MiPlaza’s customers have deadlines and their customers want the projects to be finished ‘by yesterday’. This ‘research’-attitude has its origins in MiPlaza’s history as being established by Philips Research, but needs to change in the process of commercializing MiPlaza. One of the stakeholders expressed their concern that this attitude is based on a lack of motivation, which is caused by way of working, the way people are involved in the projects. When a MiPlaza engineer is told to make something and the next day the researcher returns to get the result and that’s all, then the engineers are not involved in the project, causing decreased motivation which results in a lacking sense-of-urgency. Nevertheless, the other stakeholder also mentioned that it already saw some progress in the attitude improvement.

6.4 Conclusion

The roles MiPlaza is desired to perform by its stakeholders are facilitator (for both R&D as well as for small-batch production), librarian and technical professional services provider, where the last one includes the engineering office, test center and analytical research center. However, the technical professional services provider role is performed automatically by offering the facilities and equipment as well as the knowledge and expertise of MiPlaza’s employees with the facilitator and librarian roles.

Roles MiPlaza should not perform are the program institution and center of excellence, as those will turn MiPlaza into a competitor of several of its biggest customers. There is also a strong demand for the role of non-technical professional services provider, however MiPlaza does not need to perform this role itself, it could as well serve those demands by performing the connector role. That same role can also be used to provide the roles of program institution and center of excellence to those stakeholders who need it by connecting the demanders and suppliers of those roles.

Besides the role suggestions, several concerns by MiPlaza’s stakeholders were identified, of which the most important were no clear identity, intellectual properties and confidentiality issues, prices (too) high, MiPlaza’s legal identity, no clear cost structure, and too much ‘research’-attitude. However, the prices seemed to be comparable to similar organizations and were mostly an issue for the smaller customers. MiPlaza could use the role of connector to bring those customers into contact with scroungers to obtain more funding. The ‘research’-attitude issue is something that MiPlaza needs to work on, but will probably just be a matter of time, as the engineers working at MiPlaza will get more used to the new way of working in the concept of MiPlaza. For the other four issues, the way how similar organizations deal with those will be investigated with the comparative study in the next chapter.

7. Comparative Study

In this chapter, the role of some organizations more or less similar to MiPlaza are analyzed by a comparative study. Also the way these organizations deal with the main issues and concerns as raised by MiPlaza's stakeholders. For this study, the toolset developed in chapter 5 is used as well.

7.1 Organization selection

Although the Open Innovation concept of MiPlaza is rather unique, several organizations do exist in R&D communities that are more or less similar to MiPlaza. These organizations could be divided in cleanroom labs mainly oriented at basic research, facilitating discoveries and inventions typically about ten years before market, and cleanroom labs oriented at applied research, facilitating the research on and development of demonstrators and prototypes, typically about three years before market. This is presented in figure 7.1, which has been set up by the business development of MiPlaza and shows their view on the positioning of MiPlaza, as well as university labs and industrial manufacturing, in the innovation value chain.

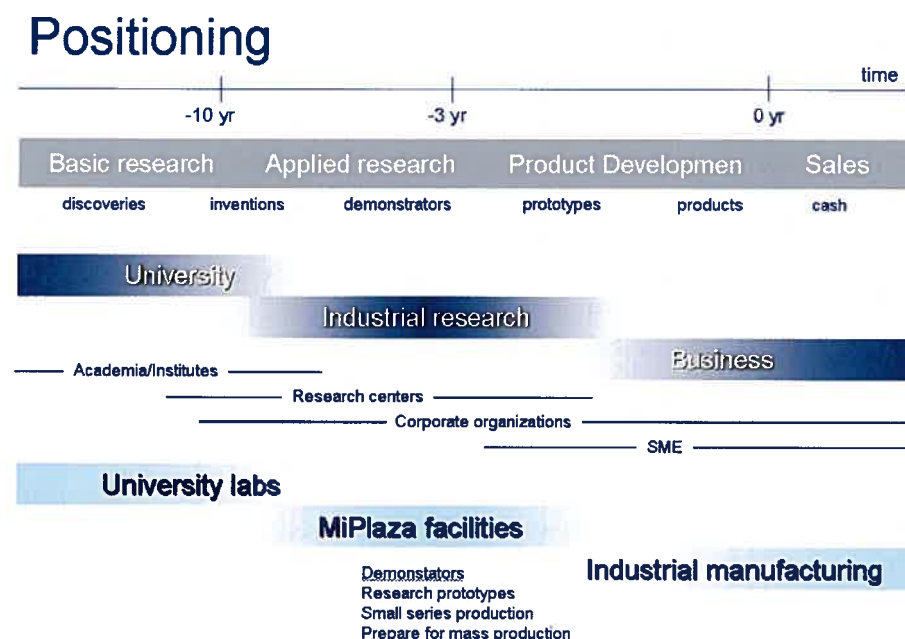


Figure 7.1: Positioning of innovation organizations in the value chain

As the industrial large scale manufacturing is too much different from basic and applied research and development, only cleanroom facilitating organizations in the first two stages of the innovation value chain will be investigated. Because of limited

time and resources only two university labs were to be selected, as well as two industrial research labs.

Since the position of university labs in the value chain is a little earlier than the position of MiPlaza, although there is some overlap as well, to keep them as comparable as possible for this study, the labs had been decided having to be located in the Netherlands, so having similar business conditions, the same legal restrictions and similar mindset and attitudes of expectant and definitive stakeholder organizations. There are three university cleanroom labs in the Netherlands, which are Dimes, at the Technical University in Delft, the COBRA cleanroom facilities, at the Technical University in Eindhoven, and MESA+, at the Twente University in Enschede. Since the COBRA cleanroom facilities are located in Eindhoven, and therefore operating in the same direct regional R&D community as MiPlaza, a much stronger competitive attitude towards MiPlaza was expected compared to the other two university labs, which could have a negative impact on the honesty and openness of the organization during the research, potentially biasing the results. Therefore, the two selected university labs for the comparative study were Dimes and MESA+.

For the industrial research institutes it was decided to select one institute in Europe and one in the United States, for diversity, but still both in western countries, and both in relatively open R&D communities.

In Europe, the two largest and well known industrial research institutes are Minatec in Crolles (France) and IMEC in Leuven (Belgium). Because of limited time and resources, IMEC had been selected as European institute for the comparative study, since there were more opportunities for making an arrangement for the research interview. But also, IMEC partly shared the Open Innovation R&D community with MiPlaza, however, according to MiPlaza business development, without being direct competitors, instead being complementary to each other as their main focuses were in different fields of nanotechnology. With this reduced risk of competitive attitudes during the comparative study, the fact that IMEC and MiPlaza partly share the same community made IMEC specifically interesting compared to Minatec.

In the United States, a very interesting institute, in which a large number of the worlds biggest nanotech manufacturers (among which: Intel, AMD, AT&T, DEC, Harrus, HP, IBM, LSI Logic, Micron Technologies, Motorola, National Semiconductor, NCR, Rockwell International and Texas Instruments [Thornberry, 2002]) work together in pre-competitive stages of R&D, is Sematech, with the corresponding cleanroom facilities ATDF (Advanced Technology Development Facility). It happened to be that a former member of the board of Sematech was working at the High Tech Campus by the time of this research being performed, which provided the opportunity for an interview just like planned for the other three organizations. Therefore (Sematech/ATDF) was selected as American industrial research institute for the comparative study.

7.2 Survey setup

To setup the survey, first the organization characteristics of interest were defined. Also for this research, the stakeholder characteristics list of step 2 in chapter 5 was used as basis, which was then modified and fine-tuned to fit this study.

After the identification number of the organization in the comparative study, the name of the organization and the position of the interviewee in the organization, the owner was selected as a characteristic, to identify whether the organization is independent or owned by another organization, and which one in that last case.

Since this survey was only about the interviewed organizations themselves, their knowledge about MiPlaza was not relevant and therefore, in contrast to the stakeholder analysis, only the level of knowledge about Open Innovation was determined.

The most important characteristic of this comparative study is the role or roles the organization performs in its R&D community. Additionally, the way the organization deals with some of the main concerns identified by MiPlaza's stakeholders in the previous chapter were selected as organization characteristic in this survey. As one of the concerns was that MiPlaza had no clear identity, the way the identity of the interviewed organization was promoted would be investigated. Also the used IP structure, the other top concern of MiPlaza's stakeholders, was selected as interesting characteristic. The concern regarding transparency of the cost structure was translated into a characteristic in this survey as well. However, concerns regarding the high costs and the 'research'-attitude were not used, since the first one seemed less relevant as a quick research learned that all labs charge about similar amounts for the use of cleanroom facilities for R&D, and the latter was already a decreasing concern.

As a last characteristic of interest for this survey an interesting outcome regarding the suggested roles for MiPlaza was used, the fact that there seemed to be quite some need for non-technical support or services by its stakeholders. It would be of interest to see whether similar organizations offer such services themselves, act as a connector to those services or just do not do anything with such services at all.

So, the list of organization characteristics was defined as:

- I.D. number
- Organization
- Position of the interviewee in the organization
- Owner of the organization or independent
- Level of knowledge about Open Innovation
- Role(s) of the organization in its R&D community
- The way the identity of the organization is promoted
- IP structure that is used
- Cost structure transparency
- Non-technical support to customers

Table 7.1 shows the organization chart where the organization characteristics mentioned above are used as column headers.

| ID | Organization | Position interviewee | Owner | Knowledge | Role | Identity promotion | IP structure | transparent cost structure | non-technical support |
|----|--------------|-------------------------|-------------------------------------|-------------------------------|------------------------|-----------------------|-----------------|-------------------------------|--------------------------|
| | | | [name of owner / independent] | Open Innovation [3,2,1] | [mentioned role(s)] | | | [yes/no] | |
| | | | | | | | | | |

Table 7.1: Organization chart

Also in this case the interview surveys consisted of four parts. The first part was a similar general introduction as in the stakeholder analysis, where first some

information was provided to the interviewee regarding the background and the purpose of the research, after which the interviewee was assured his/her feedback will be processed confidentially. The second part started with some introductory questions, in which some general information about the organization and the position of the interviewee in his/her organization were asked and the level of knowledge regarding Open Innovation was analyzed. The main survey questions focused on the role(s) of the organization and the way they deal with the concerns raised by MiPlaza's stakeholders, which are in fact the five characteristics on the right side of the organization chart in table 7.1. The final part contained a rounding off closing question. The final questionnaire is presented in appendix A.2.

Like with the stakeholder analysis, to ensure the collection of consistent and accurate data, the following interview protocol was used:

- If allowed by the interviewee, the interview is recorded on minidisk
- In case minidisk recording is not allowed, notes are taken during the interview
- Questions should be asked no more than twice; if the interviewee still does not provide an answer, the interviewer should move on
- The interview should be terminated at the interviewee's request, even if questions remain
- The interviewer should try to finish the interview within one hour, but should under no circumstances exceed two hours
- After the interview the complete minidisk recording should be worked out on a computer
- In case notes were taken instead of a minidisk recording, they should be filled out into one electronic questionnaire per stakeholder immediately after the interview
- The interview transcripts should be in the same words the interviewee used

By writing the question numbers of the survey as listed in appendix A.2 in the corresponding columns of the organization chart of table 7.1, the information transfer reference chart show in table 7.2 was developed.

| Position interviewee | Owner | Knowledge | Role | Identity promotion | IP structure | transparant cost structure | non-technical support |
|----------------------|-------------------------------|-------------------------|---------------------|--------------------|--------------|----------------------------|-----------------------|
| | [name of owner / independent] | Open Innovation [3,2,1] | [mentioned role(s)] | | | [yes/no] | |
| #1 | #1 | #3 | #4 | #7 | #10 | #11 | #12 |
| | #2 | #4 | #5 | #8 | | | |
| | | | #6 | #9 | | | |
| | | | | | | | |

Table 7.2: Information transfer reference chart

7.3 Survey analysis

After all interviews were performed and the recordings worked out in interview transcripts, which are as well listed in appendix B, the results based on the answers to the survey questions were used to fill in the organization chart. However, like with the

stakeholder analysis, due to the high level of detail this chart is for confidentiality reasons not presented in this public version of the report either.

The level of knowledge about Open Innovation seemed to be moderate to good and equally spread among the two different research groups. The interpretation of Open Innovation by Dimes was merely that organizations don't perform all their research by themselves, but have to do it together with others. MESA+ acknowledged there are multiple interpretations, but their own conception is structures in which different parties choose a way of cooperation to increase their ability to innovate. IMEC was familiar with the book by Chesbrough [2003a] and added that Open Innovation typically brings together different companies behind one and the same roadmap. In this roadmap the companies are willing to innovate together, next to each other at the same floor. From this, IP, patents and know-how are generated which they then can further develop in their own domains into a product on which they base their own additional IP. According to ATDF, the base of Open Innovation is to be able with decreasing revenues to maintain research at a specific level by cooperating with other organizations with similar fields of interest. All surveyed cleanroom organizations acknowledged to apply Open Innovation to some extent in their business operating.

The main role performed by all four organizations was the facilitator role of cleanroom equipment. Besides the cleanroom equipment, Dimes and MESA+ both explicitly mentioned to facilitate small-batches, whereas this was implicitly mentioned with IMEC through its incubator role and with ATDF through its way of just renting the cleanroom space and equipment to its customers. Dimes additionally mentioned the facilitation of education explicitly, in which they as well fulfill a position of brain gain, in fact performing the role of librarian.

Besides the facilitating and knowledge roles, some non-technical support roles were performed by both MESA+ and IMEC, while Dimes and ATDF performed only pure technical roles.

While Dimes does not provide non-technical support, it states that there are enough non-technical support organizations in the area willing to support start-ups, but they do not actively take start-ups to, for example, venture capitalists.

MESA+ offers non-technical support by means of their role as scrounger, but even more as connector. They help startups find their way in the network to find the finance or business services they need. The organizational structure performing those roles is more complex, though. The facilitator role in research is performed by the MESA+ institute, which is fully owned by the university. However, for commercialization, there are three additional legal entities. Since 'university money' is difficult money to use, i.e. it is limited by extensive regulations, besides the institute there is a foundation which allows for using originally external money to get things quickly done and it refunds itself by the profits made. Secondly, a separate entity has been founded, which is called Technology Accelerator, to provide business development and support to spin-outs to externalize them better prepared. The third unit is a private limited corporation, MTF BV, which builds facilities that are external to research and education, but important for the interactions. For example, the offices built next to the cleanrooms are owned by MTF using an external loan. The university is a shareholder of this corporation, however. The connector role of MESA+ binds these different legal entities, as well as connecting its customers to the external facilities of MTF and the business development services by Technology Accelerator.

To support the spin-outs, and external techno-starters as well, MESA+ also performs the scrounger role, helping those organizations find financing. Because of the risk of startups, the support by MESA+ in searching for the financial resources is an important factor for the financiers.

IMEC offers a lot of the non-technical services through its incubator role, while its scrounger role even becomes a little bit financier with the IMEC Venture Fund. This venture fund is financed by IMEC as well as external venture capitalists and is used to support those startups in which IMEC's intellectual property is involved, not excluding external intellectual property that is being connected with IMEC's. Performing the incubator role, an internal group of IMEC capitalizes new ideas and co-writes business plans, but only for startups in which IMEC intellectual property is involved, not for third parties.

Although both owned by a university, a striking difference between Dimes and MESA+ is the way they promote their identity. Where Dimes clearly shows they are part of the Technical University of Delft, putting the university logo on everything well visibly, MESA+ tries to put forward its own identity as much as possible and only summarily shows the Twente University logo on its communications. Interesting aspect here is that MESA+ is strongly involved in expansion and commercialization, which is indicated by their organizational structure and their business development support to spin-offs and start-ups, while Dimes clearly states their purpose is to serve the university and they don't have the need to grow and become an IMEC-like organizations, so keeping their scale within proportions. However, Dimes also states that it is not important whether they are owned by the university or by whoever, it's all performance that counts for their customers.

IMEC is an independent organization and therefore, of course, promotes itself as such. In this, they describe themselves as a one-stop-shop for technical challenges.

ATDF, which is probably of all four mentioned organizations the lab most similar to MiPlaza due to the similar origin of being created out of the cleanroom facilities of a very large high-tech organization, does not mention its original owner at all. It fully promotes its own identity, while still officially being a subsidiary of Sematech, although it has its own legal identity. That own legal identity was necessary for ATDF to be able to make profit, while its owner was a not-for-profit organization. This proves that it is possible for a cleanroom facility to have its own legal identity, while still being owned (for a major part) by the original creator of the facilities. However, besides Sematech, some other parties are represented in the board of ATDF as well, thereby having gained some form of independence.

The fact that ATDF developed as a successful organization with its own legal identity, while for a major part being owned by its original creator, combined with the fact that MESA+ strongly promotes its own identity in their commercialization as opposed to Dimes who identifies itself with their owner and has no urge to grow, this seems to indicate that a clear and own identity is necessary for successful commercialization. This corresponds with the fact that a majority of MiPlaza's stakeholders mentioned the unclear identity as an issue and barrier in cooperation, as well as with the clear identity as a fundamental success factor in an innovation network mentioned in paragraph 4.1.

The concern raised by the two small stakeholders of MiPlaza about not having a transparent cost structure seems not to be very relevant, considering the fact that only one of the interviewed cleanroom facilitators provides transparency about the way

their prices are established to some extent, while the three others all give no transparency to their customers on the cost structure at all.

The only organization that provides a transparent cost structure, at least to some extent, is MESA+. Although they do not provide a default financial overview, in the negotiations with customers it is always mentioned why the costs are what they are. They charge the integral prices to their customers, without profits however. They share the overhead costs, the fixed charges, which is always financially attractive. But no additional profits are added and the tariff structure is tried to be provided insightfully.

In contrast, Dimes employs a value-for-money strategy. They argued that, for example, when Philips representatives are visiting and asking for the tariff structure, they ask in return what the price structure of a flat-iron is, which is not provided by Philips either.

ATDF doesn't provide insight in their tariff structure either. They do make cost calculations and check the prices of other suppliers of the similar services, but a cost overview is not provided to the customers. Neither did ATDF have any experience with customers having the feeling that they are paying for the services for other customers. The customers realize that when they have to do it all on their own they will end up with costs orders of magnitudes higher.

At IMEC, when a customer would complain about the fact that it's paying for new equipment that other parties will be using as well, the argumentation is turned around and the customer is told that it is benefiting as well from investments made by others previously.

Regarding the concern of intellectual property as raised by most of MiPlaza's stakeholders, it is clear that the academical research labs try to stay away of it as much as possible. The policy at Dimes is not to have an intellectual properties portfolio and sell licences. They prefer to give the customers the intellectual property rights, because those have the resources to register it worldwide. Registering and controlling intellectual property is very costly and Dimes does not have the necessary professionals in this field. However, since Dimes prefers all knowledge to be open - it should at least be possible to be used in doctoral theses, but not all customers are happy with that - negotiations can take quite long. Dimes clearly states they don't want the intellectual property rights, but the lawyers of their customers are continuously working on protecting their rights. The position of MESA+ on intellectual properties is similar to Dimes. They don't want it and if they have it, they want to get rid of it as soon as possible. To customers they just rent cleanroom space and some services, but in the contracts there is nothing about intellectual properties and the customers have to be careful for themselves not to spill the beans. However, for some research the cooperation between MESA+ and one or multiple of its customers generates intellectual properties which they just have to deal with. In those cases MESA+ tries to find a partner who will take over their share of the IP and then commercialize and develop it further, based on licensing agreements. So, although both university labs try to stay away as much as possible from owning intellectual properties, MESA+ does sometimes license out generated intellectual property, which visualizes their more commercial way of working compared to Dimes.

Opposite to the university labs, IMEC and ATDF embrace and support intellectual property rights, but in principle they do have all the participants in intellectual property generating projects equally share the rights. At IMEC they have a range of intellectual property arrangements. In most cases they deal with partners in research

programs, which get rights to all generated foreground (i.e. in the running program) intellectual property, just due to the fact they co-invest. Also IMEC remains owner of the intellectual property rights. No partner is allowed to walk away with a patent, since the intellectual property is IMEC's new background for the next program. In some cases a specific partner might develop an invention in the program, but there will be a transfer of the rights to all partners, because the inventor also benefits from inventions made by the other partners. The transferred rights are non-exclusive non-transferable licenses which can be used for developing new products without accounting (i.e. without having to justify their use). When partners join programs at IMEC, they have to pay a background-fee. They cannot directly commercialize the background intellectual properties, but with the new intellectual properties developed in the program they participate in, which are based on the background intellectual properties, they do get the licenses to commercialize the foreground which includes the background as well. On the other end of the spectrum, there can be individual small start-up customers, who would like to have something made or developed with exclusive rights. In those cases, IMEC cannot use the generated intellectual properties as background in new programs, which is a requirement for governmental subsidy, so they will have to charge the full price. As well, IMEC does acknowledge that most start-ups do need exclusive intellectual properties to be able to compete, but also to be able to get funding from venture capitalists, so if something is developed for a start-up which also includes some intellectual property which was generated in a program, IMEC initiates discussions with the partners of that program whether they would agree that this small start-up gets the exclusive rights for a specific limited time period.

Also at ATDF, when customers participate in a project, they can use the generated intellectual properties royalty-free. However, when a customer just rents ATDF's equipment, the customer will be the owner of the intellectual property he developed using the equipment. But when an ATDF engineer generates the intellectual property, ATDF can use it in other projects or programs as well, unless otherwise agreed in contracts. Just like several stakeholders of MiPlaza are worried that some of their IP might leak to other parties, ATDF identifies the same worries with their customers and gets customer questions regarding the way the intellectual properties remain separated. ATDF acknowledges the worst thing that can happen is that something from customer A unintentionally finds its way to customer B due to a facilitator's own facilities. So, all employees of the facilitator need to be well instructed regarding what is confidential and what isn't, what it means when they get something that is confidential and how to deal with it. At ATDF all employees, even the lowest operators, get obligatory legal training in intellectual property and confidentiality.

7.4 Conclusion

All four cleanroom labs perform the facilitator role for R&D as well as small-batches. While one university and one commercial lab only provide technical services, the other university lab and commercial lab do offer non-technical support as well. Both last labs perform the scrounger role, helping their customers find financing, while the commercial one even performs the financier role to some extent. It also provides the incubator role, whereas the university lab uses its connector role to get their customers

in contact with the necessary parties. So, with the facilitator role as main role, there is no clear conclusion whether providing non-technical services better should or should not be provided for successful running the cleanroom lab.

It seemed that among the labs owned by others, the more commercially it operates, the more important is the own identity. On one end of the spectrum, the least commercially operated lab of the four included in this research, strongly leans on the identity of its owner, putting the university logo clearly visible on everything. In the middle, the university lab which tries to commercialize some more, still sometimes shows the university logo on its publications and communications, but somewhat hidden. On the other end, the purely commercial lab only presents their own identity and doesn't show the name of its original owner/creator at all. So, for MiPlaza being a fully commercial entity it seems best to only identify themselves to others with their own name and logo, without mentioning Philips as original owner/creator.

Having a transparent cost structure seemed not to be relevant, as only one of the interviewed cleanroom facilitators provides transparency to some extent about the way their prices are established, while the three other labs give no transparency on the cost structure at all.

Regarding the concern of intellectual property as raised by most of MiPlaza's stakeholders, it is clear that the academical research labs try to stay away of it as much as possible. Opposite, the commercial labs embrace intellectual property rights, but have all the participants in intellectual property generating programs equally share the rights, although both using different models. This indicates that for commercially running a cleanroom facility, intellectual properties are definitely an issue to take good care of. A very interesting approach to deal with the concerns of its stakeholders about intellectual property and confidentiality is the obligatory legal training on those issues for all employees. MiPlaza could use such legal trainings for all employees as well, to gain more trust from its stakeholders regarding intellectual properties and confidentiality.

8. Conclusions and Recommendations

To find an answer to the central question of what role or roles MiPlaza should perform within the Open Innovation R&D community in the Eindhoven region, the research was split into two parts. The first part investigated which roles were desired by MiPlaza's stakeholders for it to perform, while the second part investigated the roles of other more or less similar organizations in their R&D communities.

Although it was mentioned in the theoretical framework that it is impossible to list all possible roles an organization could perform in an innovation network, the fact that all roles that have been named by the stakeholders as current or suggested roles in the stakeholder analysis, as well as all own roles identified by the similar organizations in the comparative study, matched roles in the list of twelve main roles developed in the framework (being Connector, Scout, Inventor, Prototyper, Knowledge center, Facilitator, Financier, Scrounger, Incubator, Professional services provider, Center of excellence and Program organization), this list seemed to be adequate enough for the scope of this research.

MiPlaza's stakeholders identified MiPlaza's current roles to be in the first place facilitator and knowledge center secondly. These roles were also among the most desired roles, where MiPlaza should not only facilitate the cleanroom space and equipment for research and development, but for small-batches of techno-startups as well. Besides the roles of facilitator and knowledge center, there were also suggestions for performing roles as technical professional service provider, like engineering office and test and analytical research center. However, those technical professional services are performed automatically with the combination of the facilitator and librarian roles, by offering MiPlaza's facilities and equipment as well as the knowledge and expertise of MiPlaza's employees for the intended and specific purpose.

The role of facilitator was found to be performed by all similar organizations during the comparative study, including the facilitation of small-batch production. Also the knowledge center role was found among the compared organizations. The university labs are in fact a knowledge center by default due to the fact that they are part of universities. The commercial cleanroom facilities in the research implicitly performed the knowledge center role by the way they use the generated intellectual properties as background for new projects.

One role suggested by a few stakeholders, the role of program institution, was strongly dissuaded by one of MiPlaza's most important stakeholders, since that would make MiPlaza a competitor of its own biggest customers.

Besides the mentioned technical roles, the research showed a strong need for non-technical services and support as well, one of the main services being the role of scrounger to help find funding for innovation projects. Also the role of a professional services provider was desired in the fields of intellectual property, legal and consultancy. Two of the four investigated similar organizations did provide non-technical support, one directly and the other indirectly. The organization providing direct non-technical services and support performed the role of incubator as well as a

mixture of the scrounger and financier roles, as this organization had all the necessary expertise in-house for these services. The other organization provided indirect non-technical services and support by performing the connector role to bring its customers in contact with the third parties that could offer the specific desired services.

Therefore, the main suggestion for the role of MiPlaza in the Open Innovation R&D community in the Eindhoven region is the role of facilitator, for research and development as well as small-batch production, and additionally the roles of knowledge center and connector.

As MiPlaza was setup by Philips as one of the steps of implementing the concept of Open Innovation by offering the cleanroom facilities to third party researchers and engineers active in the field of micro and nanosystems, it should in the first place perform the facilitator role. This role supports Open Innovation by facility sharing among different R&D organizations. However, Open Innovation is not just facility sharing, but an important aspect is the opening up of the whole R&D process, where own research by an organization can be further developed internally, licensed out to another party who continues the development, or branched off into a spin-out start-up, as well as other party's research can be taken in license for further development, and joint research. Here, the role of knowledge center helps sharing and exchanging knowledge among the R&D organizations, allowing better for research by one party to be picked up by another party for further development and functioning as cohesive factor in joint research. With the connector role MiPlaza can both bring customers in contact with each other who might be able to mutually benefit of each other's R&D or setup a joint project, as well as direct all the needs of its customers for non-technical support to third party organizations offering the desired services.

To be successful in performing its role in the Open Innovation R&D community, MiPlaza needs to address both the *interorganizational* as well as the *intraorganizational* fundamental success factors developed in the theoretical framework. The first set contains trust and the existence of informal, personal networks. The second set consists of personal with functional expertise and strong interaction skills, a partnering orientation, a clear vision of the network, a strong position, a clear identity, and attractive knowledge and/or resources.

The intraorganizational factor of attractive knowledge and/or resources doesn't need any further addressing since MiPlaza contains both at a high level. Personal with functional expertise is not an issue either, however, the strong interaction skills need some extra attention considering the raised concerns by stakeholders regarding too much of a 'research'-attitude ('what can't be finished today, may be finished tomorrow') and lack of sense-of-urgency. This is something that just needs time and proper training for MiPlaza employees, as the whole concept is still new to them. The partnering orientation and clear vision of the network are no issue of concern and the strong position is something that will develop over time if MiPlaza will perform its roles properly. However, the last intraorganizational factor, a clear identity, was still a major issue of concern for the majority of the stakeholders. It does not really matter whether MiPlaza is an independent organization, or is being owned by Philips, but it has to have a clear identity. In the comparative study it was shown that for not-independent cleanroom facilities, the more commercially oriented they are, the more they should have their own identity. As the business purpose of MiPlaza is to further commercialize the cleanroom facilities, it operates fully commercially oriented.

Therefore it should carry solely its own identity and not lean on Philips' identity, no matter whether it would be independent or under full control by Philips.

To carry its own identity as well as to have the freedom of movement in commercializing the cleanrooms, MiPlaza should at least have its own legal identity, being a separate legal entity from Philips, although its shares could still be in full (or partly) ownership of Philips.

A key factor for successfully carrying out or support Open Innovation, which was also mentioned by several stakeholders, is the existence of informal and personal networks. By performing the connector role, carrying out the 'plaza' part of its name by organizing both formal as well as informal events, MiPlaza can serve this interorganizational factor and support the development of informal and personal contacts among its customer and partner base as well as third parties in the area that could have an interest in or be interesting for MiPlaza's stakeholders.

The other interorganizational factor which is essential for successful Open Innovation is trust. The major source of decrease in trust within the innovation R&D community are intellectual properties and the related confidentiality. Although Chesbrough did discuss intellectual properties when publishing the concept of Open Innovation, he did not detail on interorganizational trust. This research has shown that for performing innovation based on the concept of Open Innovation, trust is one of the major barriers - as indicated by the highest concerns found during the stakeholder analyses being the identity and intellectual properties - but essential for cooperation in an innovation network. So to extend the Open Innovation theory, for successful implementation of the concept it is a prerequisite to gain trust among network actors in the innovation environment by having a clear identity in the first place, second, having clear and decent intellectual properties models and strategies, and third, to make sure that all involved people are aware of intellectual properties and how to deal with those.

The unclarity about the identity of MiPlaza did increase concerns regarding the issues of intellectual properties and the related confidentiality, but by promoting a clear MiPlaza identity this increase can be nullified. The other recommendations to improve the stakeholders' trust in MiPlaza and decrease their concerns regarding intellectual properties and confidentiality are obligatory legal training for all employees in those fields, as well as developing a decent framework, or multiple frameworks for different types of cooperation, to have potential customers know in advance what they are up to and can expect.

So, to conclude, the roles of MiPlaza within the Open Innovation R&D community in the Eindhoven region should be facilitator (both for R&D as well as small-batches), knowledge center and connector. The first two roles can be performed by offering MiPlaza's facilities and equipment to customers, as well as the knowledge and expertise of MiPlaza's employees. To perform the connector role MiPlaza needs to know which organizations in the area are able to provide the services MiPlaza does not provide but are needed by its customers, and make as well as maintain contact with those organizations. Examples of such organizations are program organizations, venture capitalists and intellectual properties specialists. Additionally, MiPlaza should regularly organize formal meetings as well as informal gatherings with and for its customers and partners.

MiPlaza should be a separate legal entity, whether or not being fully owned by Philips, and promote clearly and solely its own identity as well as provide obligatory

legal training for all employees regarding intellectual property and confidentiality. Similar legal training could also be offered to MiPlaza's stakeholders through the formal meetings, which will benefit the trust in MiPlaza as it shows that MiPlaza takes the issue serious.

To define which strategy and models should be used by MiPlaza regarding intellectual properties and the related rights, further research would be necessary.

References

Abernethy, Mark (2002), "The International Innovation Network", *Charter Magazine*, September 2002, Institute of Chartered Accountants in Australia

Agle, B.R., Mitchell, R.K. and Sonnenfeld, J.A. (1999), "Who matters to CEOs? An investigation into stakeholder attributes and salience, corporate performance and CEO values", *Academy of Management Journal*, Vol. 42, No. 5, p. 507–525, Academy of Management

Azonano (2005), "IMEC and TNO Initiate New Research Center, the Holst Centre", *Nanotechnology News*, The A to Z of Nanotechnology, <http://www.azonano.com/news.asp?newsID=1434>, sep. 20 2005

Badaracco, Joseph L. (1991), "The Knowledge Link: How Firms Compete through Strategic Alliances", Cambridge, MA, Harvard Business School Press.

Brugha, R. and Varvasovszky, Z. (2000), "Stakeholder analysis: a review", *Health Policy and Planning*, No. 15(3), p. 239–246, Oxford University Press

Castells, Manuel (1996), "The Rise of the Network Society", Malden, MA, Blackwell.

Chesbrough, Henry (2003a), "Open Innovation: The New Imperative for Creating and Profiting from Technology", Boston, MA, Harvard Business School Press, ISBN 1-57851-837-7

Chesbrough, Henry (2003b), "Open Platform Innovation: Creating Value from Internal and External Innovation", *Intel Technology Journal*, Vol. 7, Issue 3, ISSN 1535-864X

Chesbrough, Henry (2004), "Managing Open Innovation", *Research Technology Management*, January-February 2004, p. 23–26.

Clarkson, Max B.E. (1995), "A stakeholder framework for analyzing and evaluating corporate social performance", *Academy of Management Review*, Vol. 20, No. 1, p. 92–117, Academy of Management

Cooke, Mike (2005), "More than Moore is Mooreish", part of "Looking for new solutions", *III-Vs Review*, http://www.three-fives.com/latest_features/Feature_articles/040405cooke.html, apr. 4 2005

Crane, John (2001), "Innovation and service at the forefront in sealing system solutions", World Pumps, February 2001

Declerck, Gilbert (2005), "There's Moore in Europe", *Eurosemi*, <http://www.eurosemi.eu.com/front-end/features-full.php?id=6685>, dec. 1 2005

- Dick, B. (1997), "Stakeholder analysis", available at <http://www.scu.edu.au/schools/gcm/ar/arp/stake.html>
- Dyer, J.H. and Nobeoka, K. (2000), "Creating and Managing a High-Performance Knowledge-Sharing Network: The Toyota Case," *Strategic Management Journal*, No.21, p.345-367, John Wiley & Sons
- Etzioni, Amitai (1964), "Modern Organizations", Prentice-Hall, ISBN 8-12-030193-5
- Euforic (1995), "Guidance note on how to do stakeholder analysis of aid projects and programmes", Overseas Development Administration, Social Development Department, July 1995
- Filiatrault, Pierre and Lapierre, Jozée (1997), "Managing Business-to-Business Marketing Relationships in Consulting Engineering Firms", *Industrial Marketing Management*, No.26, p.213-222, Elsevier Science Inc.
- Freeman, R.E. (1984), "Strategic Management: a Stakeholder Approach", Pitman Publishing, Boston, ISBN 0-27-301913-9
- Frost, Tony S., Birkinshaw, Julian M., Ensign, Prescott C. (2002), "Centers of excellence in multinational corporations", *Strategic Management Journal*, Vol.23, No.11, ISSN 0143-2095
- Gadde, L.E. and Håkansson, H. (2001), "Supply network strategies", Wiley
- Hering, Dean and Philips, Jeffry (2005), "Innovation Roles, The People You Need for Successful Innovation", a white paper, NetCentrics Corporation
- Holst Center (2008), "*Partners*", <http://www.holstcentre.com/index.php?id=31> , apr.11 2008
- IBM (2004), "Roles for innovation: The right people at the right times", *Executive technology report*, IBM Business Consulting Services, September 2004
- Lalkaka, Rustam (2001), "Best Practices in Business Incubation: Lessons (yet to be) Learned", International Conference on Business Centers: Actors for Economic & Social Development, November 2001
- Laursen, Keld and Salter, Ammon (2004), "Open for innovation: The role of openness in explaining innovation performance among UK manufacturing firms", Working paper, Tanaka Business School, Imperial College London / Copenhagen Business School, presented at the AOM 2004 Meeting in New Orleans, LU, 2004.
- Løwendahl, Bente R., Revang, Øivind and Fosstenløkken, Siw M. (2001), "Knowledge and value creation in professional service firms: A framework for analysis", *Human Relations*, Volume 54(7), p. 911-931, Sage Publications, London
- Maister, D.H. (1993), "Managing the Professional Service Firm", The Free Press, New York

- Man, Ard-Pieter, de (2004), "The Network Economy: Strategy, Structure and Management," Cheltenham, United Kingdom, Edward Elgar Publishing, ISBN 1-84542-837-4
- META Group (2004), "Maturing to Centers of Excellence: the next step in IT organization evolution", A META Group white paper created for Mercury Interactive, February 2004.
- Miller, George A. (2001), "Princeton Wordnet, a lexical database for the English language", *Wordnet 1.7.1*, Princeton University
- Mitchell, Ronald K., Agle, Bradley R. and Wood, Donna J. (1997), "Toward a Theory of Stakeholder Identification and Salience: Defining the Principle of Who and What Really Counts", *Academy of Management Review*, Vol.22, No.4, p.853-886, Academy of Management
- Möller, K. and Svahn, S. (2002), "Role of Knowledge in the Value Creation in Business Nets", *Competitive Paper for IMP Conference 2002 Dijon*
- Norberg, M., Campbell, A.J., Verbeke, A. (1996), "Can Market-Based Contracts Substitute for Alliances in High Technology Markets?", *Journal of International Business Studies*, Vol. 27, No. 5, *Global Perspectives on Cooperative Strategies*, p. 963-979, Palgrave Macmillan Journals
- Postek, Michael T. and Hocken, Robert J. (2004), "Instrumentation and Metrology for Nanotechnology", *Report of the National Nanotechnology Initiative Workshop*, January 2004
- QuickMBA (2005), "Open Innovation", <http://www.quickmba.com/entre/open-innovation/>, oct.25 2005
- Rizzo, John R., House, Robert J., Lirtzman, Sidney I. (1970), "Role Conflict and Ambiguity in Complex Organization", *Administrative Science Quarterly*, vol.15, no.2 (June 1970), p.150-163, Johnson Graduate School of Management, Cornell University
- Reichwald, Ralf and Piller, Frank (2005), "Open Innovation: Kunden als Partner im Innovationsprozess", http://www.impulse.de/downloads/open_innovation.pdf, dec.1 2005 [modified version in: Habenicht, Foschiani, Wäscher (2005), "Festschrift für Erich Zahn", Berlin, Peter Lang Verlag]
- Salancik, Gerald R. and Pfeffer, Jeffrey (1974), "The Bases and Use of Power in Organizational Decision Making: The Case of Universities", *Administrative Science Quarterly*, Vol.19, No.4, p.453-473
- Sawhney, Mohan (2005), "Innovating Beyond Boundaries: Open Innovation", Merck Academic Lecture, May 9, 2005
- Schmeer, Kammi (1999), "Stakeholder Analysis Guidelines" in Policy Toolkit for Strengthening Health Sector Reform, Abt Associates, Inc., Bethesda, MD.

Sitra, Finnish National Fund for Research and Development (2005), "Making Finland a leading country in innovation", *final report of the Competitive Innovation Environment Development Programme*, Helsinki, Edita Prima Ltd., ISBN 951-563-501-2

Smith, H.L., Dickson, K. and Smith, S.L. (1991), "There are two sides to every story: Innovation and collaboration within networks of large and small firms", *Research Policy*, No.20, pp.457-468, Elsevier Science Publishers B.V.

Suchman, M.C. (1995), "Managing Legitimacy: Strategic and Institutional Approaches", *Academy of Management Review*, Vol.20, No.3, p.571-610, Academy of Management

Thornberry, Jon B. (2002), "Competition and Cooperation: A Comparative Analysis of SEMATECH and the VLSI Research", *Enterprise & Society* 3, Business History Conference, December 2002

Utz, Anuja and Dahlman, Carl (2007), "Promoting Inclusive Innovation", *Unleashing India's Innovation: Towards Sustainable and Inclusive Growth*, edited by Mark A. Dutz, World Bank, ISBN13 9780821371978

Varvasovszky, Z. and Brugha, R. (2000), "How to do (or not to do) a stakeholder analysis", *Health Policy and Planning*, No.15(3), p.338-345, Oxford University Press

Appendix A. Survey questionnaires

In this appendix the questionnaires are listed which were used for the research surveys. Two different questionnaires were used during the research, for the stakeholders and for similar organizations. Although the original questionnaires were setup in Dutch, as all interviewees were native Dutch speakers, they are here presented in English.

A.1 Stakeholder questionnaire

General Introduction:

Information about interviewer and background of the research

Explanation of the confidential way of working

Introductionary questions:

1. What is your position in your organizations?
2. Are you familiar with the Open Innovation concept? And what is your interpretation?
3. In which way does your organization deal with Open Innovation, and where do you consider yourself in the value-network?
4. To what extend are you familiar with MiPlaza ?

Main questions:

5. How does the position of your organization in the value-network relate to MiPlaza?
6. Which role do you think MiPlaza currently performs? And which role could or should MiPlaza perform in your opinion?
7. What aspects of the concept of MiPlaza do you consider attractive?
8. What do you consider as added value for you own organization in a cooperation with MiPlaza?
9. Which possibilities could you identify to increase this added value?
10. Do you experience any issues, barriers or difficulties?

11. What possibilities do you see or what suggestions do you have to solve those issues?

12. Which aspects of MiPlaza are to clear yet?

Closing questions:

13. Is there any other business you'd like to discuss about MiPlaza with respect to this research, which have not been mentioned yet?

14. Who or which organization could you advice to interview as well for this research?

The questionnaire for internal stakeholders was the same as for external stakeholders, except questions 4 and 5 were only asked the external stakeholders, as they are not relevant for internal stakeholders.

A.2 Similar organization questionnaire

General Introduction:

Information about interviewer and background of the research

Explanation of the confidential way of working

Introductory questions:

1. Could you briefly describe your organization and your position within?

[in case not mentioned in the answer to the previous question]

2. Who is the owner of the organization?

3. Are you familiar with the Open Innovation concept? And what is your interpretation?

Main questions:

4. In which way does your organization deal with Open Innovation?

5. Which role does your organization perform in the R&D community?

6. Where do you consider the position of your organization in the value-network?

[in case the organization is not independent]

7. How does your organization identify itself to your customers? As an independent organizations, or as a part of <owner>?

8. What do you think your customers' opinions are about the fact that your organization is actually a part of <owner> ?

9. How does your organization promote itself to customers and potential partners from a marketing perspective?

10. How does your organization deal with IP with respect to you're your customers? What kind of IP structure is employed in your organization, and why this one?

11. Regarding the financial aspects, do you provide complete transparency to your customers about how the prices are established, a fully transparent cost structure?

[in case not yet mentioned]

12. Besides the cleanroom facilities and expertise, do you also offer other forms of (non-technical) support ?

Closing question:

13. Do you have any questions or remarks as a results of this interview?

Appendix B. Interview transcripts

Because of the large amount of pages the full transcripts of the interviews are published in a separate bundle. Due to confidentiality reasons this bundle is only provided to MiPlaza business development and the members of the graduation committee.
