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STARTING UP NETWORKED INNOVATION PROJECTS

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1. Introduction

Innovation collaboration that differs from the traditional supplier-client model gains more and more interest from companies as well as from researchers. These new approaches, which in themselves may differ widely, are generally called '*open innovation'* [Chesbrough 2003]. The study described in this paper is directed towards one particular form of open innovation, called '*networked innovation':* i.e. the collaboration of two or more companies in a partnership. Its goal is to develop new tangible products or product-service solutions together from early innovation stage on, prior to the well-structured New Product or Process Development -the so-called fuzzy front end- [Koen et al. 2001]. In doing so, the partner companies share possible risks and gains on their often unpredictable route towards the innovation, in contrast to working together in a customer – supplier relationship, where tasks and profits for all stakeholders have been defined in advance. Stimuli to engage in this form of collaboration are, among others, the prospects that networked innovation will reduce costs [Hagedoorn 2002]; that the result of combining valuable information from different backgrounds makes the sum of it larger than the parts [Miotti and Sachwald 2003]; and that a company can expand into new markets that would be out of reach for one company alone [Van de Vrande et al. 2009].

This approach, however, also has its drawbacks, which are mainly caused by its novelty: reliable ways how to execute networked innovation projects have yet to be found. Additionally, there is little perception how events during networked processes influence each other and what their consequences are on different organizational levels. Consequently, when faced with problems caused by the different new ways of collaborating, companies either try to solve them by using familiar patterns from 'closed' innovation which do not fit the new problems anymore, or they try to find new approaches by trial and error time and again.

Repeated complaints from companies about the difficulties they meet while carrying out collaborative projects gave the incentive to research the way networked innovation is actually carried out from various viewpoints. A multidisciplinary team was put together to get new insights about this form of collaborative innovation related to different organizational levels in a four-year long research project. From the start on, nine companies committed themselves to the project. They all had already experience in open innovation and they had an expressed interest in networked innovation. The companies were chosen because of their diversity in size, product range and business sector. All of them are companies with European headquarters. As a matter of fact, the nine companies did not form a network among each other. They range from large sized to small and medium enterprises and are operating in electronics, food, aircraft, automotive and industrial design. Business-to-business and business-to-consumer products are spread among them. Companies who professionally support innovation are represented by an innovation consultancy, a regional network of high-tech companies and a foundation aimed at stimulating innovation in The Netherlands.

2. Research questions and research design

The project was started with an exploratory study. Its goal was to get an overview of the motivators these companies have to engage themselves in innovation networks, of the way they are actually carrying out these projects, but also to chart the pitfalls they meet in doing so,
Main questions of the study, which will be discussed in the paper at hand, were:

1. Why networked? What motivates a company to engage in networked innovation instead of maintaining the traditional closed approach?
2. Finding the right partners – where and who? How do companies find their partners and what do they seek in a partner? Which factors impede finding partner companies?
3. How are networked innovation projects started? Which factors challenge the start-up of a networked innovation project?

Other aspects of the study, which focus on the challenges that occur in networked innovation related to the different organizational levels are discussed in [Maurer and Valkenburg 2011]. Based on the exploratory study as a whole, currently several in-depth case studies are carried out to study networked innovation on different organizational levels.
Every company that took part in the research project had delegated a contact person from senior management, usually an innovation manager, who was interviewed two times in a semi-structured setup. After analyzing and interpreting the data, the results were presented to the interviewed persons to be verified for their correct interpretation. Table 1 gives an overview of the companies who took part in the project. Companies 7 and 8, a regional network and a government-based foundation which are networked organisations in themselves, are listed as SMEs: this refers to their number of staff members, not the size of their networks, which are much larger.

Table 1. Overview of the companies

Company	Business sector	Size
(1)	Electronics	Large
(2)	Food	Large
(3)	Aircraft components	Large
(4)	Automotive	Large
(5)	Aircraft interior	Large
(6)	Industrial design	SME
(7)	Regional network	SME
(8)	Government-based foundation	SME
(9)	Innovation consultancy	SME

3. Results

3.1 Why networked? The reasons to innovate in networks

When asked why they wanted to innovate in networks instead of in-company and/or together with customers and suppliers, all companies gave as first reason that the traditional way of innovating does not suffice any more to stay competitive in today's markets. However, none of the producing companies did exclusively use networked innovation, they all continued to operate in customer-supplier relationships. Looking closer into a company's motivation, we detected different goals.
A main goal was the *improvement of the innovation process*. All producing companies (1-6) stressed that networked innovation can save time and money for all partners. Expertise that would have to be bought in a customer-supplier relationship, now can be shared without making extra costs. Company 1, who had the greatest experience in networked innovation projects, especially uses the expertise of a partner company to test the effectivity of an innovation route as early as possible. It helps them to decide if an innovation will be viable and lucrative enough for them to proceed with it, before having to invest in expensive production tools. If it is not, the innovation process based on that idea will be brought to an end. The companies 1, 2, 4 and 5 wanted to speed up innovation processes by joining

efforts with a partner. These motivations are consistent with findings of other researchers, such as [Chesbrough and Crowther 2006].
Quality improvement by risk sharing can be another strong motivator, as is indicated by companies 2, 3, 4, 5 and 6. A company that is only paid for rendered services on a pre-defined scope and during a limited project stage, is less likely to grasp the project as a whole and to contribute to the vision of the overall project (stated by company 5). Whereas a partner, who will finally gain from his efforts, will be more motivated to give input on long term and on a high quality level.
Another strong reason to collaborate with a network partner is to *get expertise that lies beyond the scope of the own company*. The tangible products of the companies 3 and 5, who operate in mature industries, ceased to be lucrative enough. Both companies therefore wanted to expand their product range by adding services that added extra value to their core products. They both realized that their in-company expertise would not be sufficient to offer the new products at the same high quality level as the core products. Therefore they decided to develop them together with a network partner instead of a supplier, so that the responsibility for the product-service integration lies with both partners.
Although none of the nine companies was already satisfied with its own approach, they all were confident that networked innovation would be a necessary addition to their closed approach.

3.2 Finding the right partners – who and where

3.2.1 Which partner?

The previous section already showed that delivering expertise that is not present in the own company can be a strong motivator to collaborate with a partner. All producing companies (1 – 6) confirm that they mainly looked for a partner who could deliver enabling technologies or complementary competences. The networks of the three innovation consultancies were mainly defined by their own target groups: in the case of consultancy 9, these are large companies. Consultancy 7 is the core of a regional network, which helps entrepreneurs to bring their innovations to market. It supports mainly, but not exclusively, small and medium enterprises and also connects regional knowledge institutes to its members, if needed. The broadest network belonged to consultancy 8, a government-based foundation that is assigned to stimulate open innovation based on social themes in the Netherlands. Companies of all sizes as well as knowledge institutes can join. Two other factors helped determine if a partner was the right one: the relative size of a company and being able to trust the partner.
As to the first factor, *the relative size of a company*, all companies stated that they were not willing to collaborate with a company of distinctly different size. They were convinced that the same order of magnitude is a necessary condition to make collaborative projects successful. They had experienced that otherwise there would be an immediate imbalance of power between companies. Furthermore, processes are likely to be running out of sync if a company with a complex organizational structure (as most large companies are) and longer decision making procedures is combined with a smaller company with a flat hierarchy and quick decision making. As a consequence, the smaller company will suffer from delayed processes, which can result in having trouble to finance the project anymore.
The second factor, *being able to trust a partner*, was also stressed by most of the interviewed managers as a main factor determining partner choice. They related trust to the companies as a whole, as well as to all actors in a project. 'Trust' was referred to in two different meanings: one, that the partner would not break confidential information to competitors (stated by company 1, 2, 4, 6); second, that actors within a project could rely on that the partners would divulge the necessary information to them, and not withhold it to get a more dominant position in the collaboration (companies 1, 4 and 6). The companies 3 and 5, who, due to their relatively small and regulated business sectors also dealt with trust issues, decided to set up an alternative route, where the importance of mutual trust did not matter as much: they co-developed scenarios to elaborate strategies about future developments in their business domain.

3.2.2 Where to find them?

Most of the interviewed companies (1, 2, 6, 7, 8, 9) are relying on their existing business network to find innovation partners, which means that they already know the partner or have even done business

with him. Company 6 has adopted the practice to test the quality and reliability of a partner in a customer-supplier setting first before offering to collaborate with him in a networked setting.
The size of a company's network differs, of course. The companies 3, 4 and 5 complained that, due to their small business sector, their existing business networks were too small to establish successful networked innovation projects. Company 4 also remarked that they lacked experience in building sustainable networks, due to the lack of time and financing – a problem that is confirmed by consultancies 8 and 9, who often see that entrepreneurs do not invest enough in future developments.
In a multiple-company network, however, not all partners have to be acquainted with each other. The three consultancies (7, 8, 9) consider it as one of their tasks to link relevant stakeholders to each other.
Three companies had trouble to find partners at all (3, 4, 5). Their difficulties relate to their business sectors: the aircraft and automotive industry. Especially the aircraft industry is highly regulated and comprises a relatively small number of possible network partners. Potential partners, for example suppliers, are likely to work for a competitor as well, which of course questions their trustworthiness. Especially in innovation projects at the fuzzy frond end, which are still far from being legally protectable, this fact discourages companies to begin innovation partnerships. If, on the other hand, a company from outside wants to enter that sector, it is by law subjected to lengthy and costly application procedures (with no guarantee that they pay off during the innovation project).
Not all collaborations are based solely on the initiative of companies. Innovation projects can also be financed externally by national government or European funding. All of the interviewed companies participated in such projects. Two of them (3 and 4), however, were at the time of the interview mainly dependant on them. The terms of an externally financed project make it able to work together on common topics without taking too many risks. Unfortunately, these projects also have their drawbacks which may challenge a collaboration. A network has to meet the requirements of the provider, who, for example, demands to have knowledge generated on pre-defined themes or who wants smaller companies to profit from the slipstream of innovations generated by larger companies. This may (in the first case) lead to awkward partnerships, such as between competitors who are temporarily collaborating, but who are avoiding to share confidential, yet necessary content (reported by companies 3 and 4). In the second case, the terms of external financing demand collaborations between large and small companies who completely differ on an organizational level, which may result in general misunderstanding and unaligned processes (reported by company 4).

3.3 Getting started - ways to begin a networked project

The companies used different approaches to start a networked innovation project. We noted several independent factors that determined the way a networked project begun. The first had to do with the stage the collaboration started: at the fuzzy front end, or close to the business case. In the first case, partners will define main innovation themes together, not knowing where the innovation finally will lead. In the second case, one of the partners is likely to have already predefined the innovation scope. A second factor is the way a project is financed: autonomously, by the innovation partners themselves, or externally. The third factor is the way a project is organized: again, autonomously, or with the aid of a supporting agency. We found three different ways to start up networked innovation at the fuzzy front end and two closer to the business case. It may be noteworthy to say that most companies avoid to make any formalized agreements at the early conceptual stages of networked projects. In their experience, contracts and legal caution stifle the atmosphere of openness developing concepts of the future demands. However, the closer to a business case, the more agreements are being made.

3.3.1 Fuzzy front end (1): organizationally and financially supported networks; passive partner approach

The most provided way to start innovation networks is offered by the consultancies 7, 8, 9. They prepare the start of a collaboration even before a network is formed, by doing preliminary research into themes which may be relevant to future innovations. Then, interested companies are invited to kick-off meetings. The government-based foundation 8 also encourages its participants to bring in their own innovation themes. Kick-off meetings consist mainly of guided brainstorms in a workshop setting; in this way, potential partners can make first acquaintances and the broadly formulated

innovation themes may be narrowed down. In the next step, teams are formed, either by the participants themselves (consultancy 7) or by the facilitating consultancy (8 and 9). There is a calculated efflux at this point: not every participant is able to identify with the innovation themes or is able to find a suitable partner. Consultancy 7, the regional network of entrepreneurs, stops its facilitating activities at this point. It is convinced that companies have to push through this step actively to build successful networks; besides, its managers reported that their members would not appreciate a third party meddling with their businesses. Consultancy 8 is bound by the terms of the foundation to limit its support to the pre-competitive stage and facilitates innovation team meetings up to the business case. Consultancy 9 offers its services even further into product development.

3.3.2 Fuzzy front end (2): self-organizing and externally financed networks; active/passive partner approach

The participation of all interviewed companies in externally financed projects has already been mentioned. Company 4 describes how an externally financed consortium is built in automotive industry: when a new project is made known by a tender, interested companies start to exchange ideas about the possible content, which at that moment are still unstructured. This sector has several commonly accepted leaders who will consequently take leadership in the project. It takes years to become a leader and requires that a company has previously conducted successful projects and that it can handle the pressures of project management in terms of competences and capacity. The leaders take initiative during the process: they define themes, ask other parties to join and they subsequently direct a project. Company 4, who is not one of these leaders itself, is often asked to join as a project partner. In this role, they get the opportunity to choose other partners (for example, knowledge institutes or smaller companies) within a work package, which still remains a strenuous process for company 4.

3.3.3 Fuzzy front end (3): organizationally and financially autonomous networks; active partner approach

Two companies, the electronics manufacturer (1) and the design agency (6) start networked innovation projects completely autonomous. As soon as company 1 receives signs about potentially interesting developments, it begins to contact other companies or knowledge institutes with state-of-the-art knowledge. When this knowledge network is activated, the networked innovation route begins. Company 1 uses a structured approach with gates to determine if both, the goals of the innovation project as well as the collaboration with the partner, reach the desired quality level. Company 6 follows a similar approach: it researches innovation themes which are relevant for its business sector and develops scenarios around possible problems of their potential clients. Up to this step, company 6 operates without the involvement of partners, because it has made the experience that too early collaboration impedes innovation. In the next step, possible partners are approached and the preconditions of a project are established. Preconditions may be the relevancy of a theme, the definition of a business case, the investment volume of each partner and task distribution.

3.3.4 Closer to business case (1): organizationally and financially autonomous networks; active and passive partner approach

The food industry company 2 is always on the lookout to find promising product components which may contribute added value to their own core products. Sometimes, they are approached by companies or individuals which may deliver those components, but they are also regularly searching actively for them by literature and patent research. Once a contact is made, company 2 checks out the suitability of the potential partner. Generally, these projects will start with a collaborative research component, which will be continued in a commercial collaboration including product development and market introduction.

3.3.5 Closer to business case (2): organizationally and financially autonomous networks; imposed switch from supplier to partner

Company 5 originally had no intention to change its role into a partnership. However, its main customer had changed his business model one-sidedly into a networked innovation approach. The customer's former suppliers were invited to compete with other potential suppliers to become a partner in a collaboration that would be guaranteed for several years. Instead of developing upon specifications, they were asked to co-develop future concepts. The supplier with the best offers was finally chosen as a partner. This meant two major changes for the former suppliers: first, they had to specify all deliverables at cut-rate prices at a very early stage. Second, the former supplier had to focus on scenarios which lie farther in the future than they were accustomed to. Apart from the financial gain, the approach made the former customer profit in two ways: his risks will be shared and a partner company will have stronger interests in developments than a supplier would have.

4. Discussion

Looking back to the research questions, we now can compare the motives of the companies to start networked innovation to its payoffs, we learned how those nine companies look for partners, and we can distinguish several ways how networks are built.

4.1 Why networked? Expectations and outcomes

All of the interviewed companies were highly motivated to use innovation networks. They all wanted to pursue multiple purposes in doing so: to improve the products they develop, to expand their product range and to improve their innovation processes. The customer-supplier relationships they traditionally used, and for several purposes still use parallel to this innovation method were not sufficient anymore to reach their targets, according to the interviewed managers. However, when asked if the networked approach already had paid off, most of them declined.

4.1.1 Speeding up processes

The interviews showed that there were two steps in networked innovation that cost a company more time than they had expected: one was the building of a network, the other the innovation process in itself. Especially the companies who, due to their business sector, have a relatively small choice of suitable partners, had trouble to expand their network and to start the intended projects at all. Speeding up processes, on the other hand, was one of the main motivators.
When asked about the time a networked project took till its completion, the interviewed managers told that the time gain compared to their traditional way of operating was not significant. Sometimes processes even took distinctly longer. The company managers accounted the delay to not yet having found a good approach to handle networked innovation projects on a day-to-day basis. This was confirmed in the interviews with the innovation consultancies who, based on the same observation, are consequently lying the focus of their activities on the improvement of innovation processes.

4.1.2 Sharing expertise

The sharing of expertise that otherwise would have to be bought, or even would be inaccessible to a company, was rated as a positive aspect of networked innovation by all companies. We saw that this motivator was used throughout the innovation route: by some companies at the early stages of innovation, by others relatively close to the business case. There were different reasons to share expertise: collaborating with a partner at an early stage helps a company decide as soon as possible if the intended innovation should be pursued at all. An innovation that is not profitable enough, or that would lead to a business that is not interesting for the company in question, may consequently be stopped immediately. Even though not leading to product development, with this the collaboration helps a company to save time and money. This approach can be especially efficient in the early stages of innovation, when concrete goals are still undefined and broad knowledge areas have to be covered. In cases where the networked collaboration was continued up to product development, however, no time gain was experienced anymore.

4.1.3 Building scenarios of the future

A distinct advantage of networked innovation was found in the aircraft sector. Operating in this mature industry, companies are mainly accustomed to rather incremental innovations upon specifications from their customers. The two companies from aircraft industry, however, have started to develop future scenarios together with innovation partners. Instead of exclusively working on short-term goals, the collaboration allows them to broaden their perspective onto medium- to long-term developments, and to define the role they want to have in them, which, according to the interviewed managers, helps to improve their market position considerably. An added advantage is that in this way, content can be developed together without the menace of trust issues. The consultancies affirmed that networked innovation's potential to develop future scenarios can also be an important asset to SMEs. They remarked that smaller companies mainly focus on filling their order portfolio on the short term (which of course is quite understandable in economically tough periods as these) and forget to invest on the role they want to play in the future. They recommend to free some time to develop future scenarios together with network partners. As far as the interviews show, developing valuable expertise together on a relatively cost-free basis seems to be one of the most rewarding incentives to start networked innovation.

4.2 Finding the right partners

The study showed that the interviewed companies mainly depended on their existing business networks to find partners for networked innovation projects. To know what a potential partner can offer, and above all, his trustworthiness were the given main reasons why a company is reluctant to search for new partners. However, for the companies that operate in relatively small and regulated sectors, the existing network can be too small to find suitable partners at all. The interviews indicated that companies who had these problems were largely focused on developing their desired innovation content and gave less attention to the development of a network with relevant stakeholders.

Altogether, compared to the efforts the companies put into realizing their goals in networked innovation, we found it remarkable that most of them had no clearly defined concept of (i) who their possible partners could be and (ii) of the motivations of the partners to enter a network. Paying more attention to the partnership itself may be a main factor to improve the success rate of networked innovation. It certainly is worthwhile to investigate whether a clearer view of what a company wants to achieve by the innovation and who the best partners are in doing so can help to improve this situation.

4.3 Ways to start a networked project

The study also showed that there is not one general practice to begin networked innovation projects. We found several ways in which networked innovation is started up, from projects that are financially and organizationally supported by professional innovation consultants, via externally financed networks up to those that operate completely autonomous. All in all, we could not detect network forms that were distinctly better than others: each form has its own pros and cons and is used by the companies accordingly. Networks that are organizationally supported offer an accessible way to networked innovation. Even in the first meetings, large amounts of ideas are developed and participants do not have to bother to find like-minded people. On the negative side, we saw that those networks are relatively unstable and that the guided process easily causes a certain passivity among the network participants.

Externally financed networks can be awkward for the participants, depending on their terms: companies are temporarily partnered with those that would be out of the question otherwise (such as competitors or companies with inadaptable organization forms). Yet, they offer a low-risk way to gather new information on topics relevant to the industry sectors in question. Despite their drawbacks, all interviewed companies made use of them.

Autonomous networks mostly appeared closer to the business case. At the fuzzy front end, only two companies were operating autonomously. They had a clear picture of what they wanted to achieve by networked innovation and took efforts to experiment (thus investing lots of time) to find a suitable process. In these networks, being completely able to define the content is balanced against efforts to

steer through novel processes that are unlike traditional innovation processes and to be able to finance a project for unforeseeable length.

5. Conclusion and future work

As indicated, this explorative study is embedded in a large project on networked innovation, which researches the way networked innovation is actually carried out from various viewpoints. A multidisciplinary research team was put together to get new insights about this form of collaborative innovation related to different organizational levels in a four-year long research project.
The exploration indicated the practical relevance and urgency of the subject at hand. All companies regarded networked innovation as important and necessary. However, they also stated it to be different from established approaches and to be much more complex. The research project as a whole therefore aims to develop tools and techniques for networked innovation.
Different types of networks exist and all in all, the authors could not detect network forms that were distinctly better than others: each form has its own pros and cons and is used by the companies accordingly. A more in depth analysis of this can be found in [Maurer and Valkenburg 2011].
An interesting notion from the explorative study is that at large, little attention is paid to the development of a network with relevant stakeholders. This finding led to a sequential research project, which focuses on the way networked innovation projects can be carried out by companies that experience main challenges: namely, those operating within relatively small and regulated business sectors. The paper at hand discusses their problems in building a partner network. Together with several companies and other researchers the authors are currently developing and testing methods that are bound to get a clearer picture of the position a company wants - and is able – to achieve by innovating in networks. Another aspect in this current work is to develop ways how partnerships can be created that offer a sustainable value flow for all stakeholders in the innovation networks.

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