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# Innovation intermediaries: a process view on open innovation coordination

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The paper reports an action study of seven innovation projects with collaborative partnerships in inter-organisational networks that are facilitated by innovation intermediaries. It contributes to open innovation literature the understanding of innovation processes as nested processes of co-creation on the one side and economic exchange on the other side. While innovation project management and (online) market places are well researched as distinct strategic positions, our observations suggest a third strategic position for innovation intermediaries as process coordinators with strategic innovation capabilities. The paper identifies matchmaking and innovation process design, management of collaborative projects, project valuation and portfolio management as three such strategic capabilities and identifies directions for future research on this emerging phenomenon.

**Keywords:** open innovation; collaboration; innovation process; innovation value chain; SME; deal flow portfolio; innovation valuation

## 1. Introduction

Within the scholarly domain of R&D management, open innovation (Chesbrough 2003) is discussed as a strategy to increase returns from innovation through exchange across firm boundaries. Such exchange can be beneficial in both directions (Dahlander and Gann 2010): outbound through the independent external commercialisation of internally developed intellectual property that does not readily find application in the firm's own product portfolio,e.g. through online market places such as NineSigma; or, inbound, adoption of external developments benefits the firm's products, e.g. through online market places such as Innocentive. In both cases the firm boundaries are opened up for innovation which is a recent development, but mainly to large firms. Small and medium sized firms (SMEs), whether they have been in existence for a long time or have recently launched as start-ups, always had a stronger need to collaborate owing to their lack of internal resources. While collaboration has formerly been looked upon as a strategic necessity to compensate for the lack of resources (Eisenhardt and Schoonhoven 1996; Das and Teng 2000), the focus on open innovation now puts strategic opportunities in innovation markets into focus for SMEs as innovation suppliers.

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The systemic setting for innovation, much like all markets, only runs with the necessary intermediaries in place that make interactions and matching of partners possible. According to new institutional economics this is a way to minimise asymmetric information on the market (Spulber 1999). It therefore is not surprising that scholarly discussion on the role and functions of intermediaries has intensified in various fields at the same time (Howells 2006; Lopez and Vanhaverbeke 2009; Roxas, Piroli, and Sorrentino 2011; Zhao and Zheng 2011). Innovation intermediaries are no new phenomenon and there is a formidable variance of agents. Because innovation has for long been seen as a domain of market failure it is a public priority to support especially resource-limited SMEs through technology transfer offices, business incubators, or entrepreneurship centres. These have been strategically positioned close to universities and research centres, where the technology-based start-ups emerge. Others, such as science parks or development agencies have been positioned in often local or regional SME networks (Lee et al. 2010). Given their strong public funding, many have a legal and governmental non-profit structure. In contrast, younger innovation intermediaries such as the above-mentioned examples of NineSigma or Innocentive have a commercial structure and operate on the basis of reward fees that they receive for exchange deals between knowledge and technology supplier and customers. Their success – and with no doubt current public budget austerity – provides theoretical and practical motivation to understand the changes in collaborative innovation processes and the 'shift from being a mere facilitator of innovation to being also a source and/or carrier of innovation' (Klerkx and Leeuwis 2009).

The aim of this paper is to explore collaborative innovation processes in open networks and especially the strategic implications for involved SMEs and intermediaries. The focus of this research is on the early stages of the innovation process in which technology based SMEs are particularly involved. The generally attributed advantage of SMEs in this stage is their agility in the creation of innovation (Lawton Smith, Dickson, and Smith 1991; Alvarez and Barney 2001; Minshall et al. 2008), a reason for which we found large firms interested in cooperation with SMEs. Again the typical SME resource constraints were in place, e.g. when SMEs were not able to pay the fees for the innovation market portals. As a result of the recent emergence of open innovation and the dearth in identified and described innovation cases in open innovation, we have undertaken an action research study. The research team has participated in open innovation processes to gain in-depth knowledge through direct experience in a total of seven cases in two settings: one setting in which large firms search for SMEs to cooperate with, and the other setting where start-up firms are promoted to find collaboration partners for growth.

We observed that those cases did progress well in which the intermediary could show to both collaboration partners tangible outcome with clear economic value, so that we refer to it as 'deals'. We found that those deals can be made in the very early stages of the innovation process, for example, in the form of a price in an idea competition. More deals in later stages provide new valuations and progress measures, but unlike in pure online markets the intermediary got involved not only in brokering transactions but also in the creation/production part of the innovation process. What looks at first sight similar to the publicly financed facilitation and SME support, emerged as a value creating service based on competences such as matchmaking, innovation process management and portfolio management on which intermediaries built a sustainable competitive position. From planning action interventions during the study we experienced that young start-up teams, existing SMEs and large firms alike prefer commercially viable innovation value chains that allow for the definition of viable strategic positions, including for intermediaries. We equally experienced that engineering and execution of such collaborative innovation processes is conceptually and practically underdeveloped.

The paper aims at contributing to academic understanding of the managerial issues in open innovation processes, starting with building processes from within open network to managing their execution. The paper aims at contributing to practice guidance in the definition of business strategies for innovation partners, especially intermediaries from a set of capabilities such as holding portfolios of innovation projects, matchmaking and innovation process/project management. The remainder of the paper is structured as follows. We set the scene with a review of literature on open innovation and in particularly the role of intermediaries on one side and the management of innovation processes on the other. We then introduce settings and method of the action research study and give a short narrative of the cases. The paper is completed with a discussion of observations from the study, conclusions and directions for future work.



## 2. Open innovation and innovation process management

Open innovation thinking offers a framework in the tradition of Smith (1776) in that increasing work specialisation, here for innovation activities, is combined with improved market exchange mechanisms to strategically leverage the outcome of innovation efforts (Gassmann, Enkel, and Chesbrough 2010). A set of tools such as technology trading, know-how, patent and licensing markets (Chesbrough 2003) are proposed together with quite normative recommendations for change in organisational culture and corporate governance to make such open innovation successful. Market relationships are facilitated, for example, by recent online market places such as Innocentive or NineSigma that are reported to have received over 20,000 innovation proposals from all over the world and facilitated over US$12 million in contract awards with mostly large firms such as Kraft, Philips or Unilever (Lopez-Vega and Vanhaverbeke 2009). These platforms act as market brokers that match innovation problem owners as customers with solution providers as suppliers and get remunerated through transaction fees. Their source of competitive advantage is a monopolised portfolio of supply and demand from which deals can be generated. The examples suggest that market transactions are well suited to generate such deals, but matchmaking is only a part of the transaction costs in the innovation process. It does not surprise therefore that warnings are issued on other costs of coordination if the production or co-creation process of innovation is included in the analysis as a 'conceptual frame for open innovation from the perspective of product/technology lifecycles and the different phases through which an innovation evolves from conceptualization to commercialization' (Dahlander and Gann 2010).

In the words of Van de Ven innovation management is the 'managing of new ideas into good currency' and fundamentally a problem of process understanding (Van de Ven 1986). His study was focused on processes within organisation. Innovation can be seen as a process similar to other business processes (Hammer and Champy 1993) so that techniques of processes and quality management should be applicable. For example, innovation processes are enabled by promoters from all hierarchical levels (Witte 1973; Fichter 2009) who can be compared with supply chain managers and quality managers. Another central thought of quality management is statistical process control (Deming 1986) that posits that process coordination is based on quantitative measures of outcome and intermediate progress. Fields such as production or supply chain management, in which statistical process control has successfully been applied, map process steps along the value chain in great detail and establish quantitative measures for each of them. Such coordination is not necessarily effected through supervision in organisational hierarchies. For innovation, process overview models exist for aspects such as technology brokering, competency rallying (Katzy and Crowston 2008) and open innovation (Chesbrough 2003) but the maturity of understanding in the

innovation process that is sufficient for strategic business process reengineering still needs to be developed.

Coordination of innovation processes is often provided in open networks or innovation systems at the regional or national level (Edquist 1997). Such systemic understanding of innovation stresses the interactions between firms and other stakeholders relevant to the social system. Like open innovation this is a view on inter-organisational innovation processes across the borders of single firms and into a broader, but coordinated network of stakeholders including governments, industry and science/academia in 'triple helix'-interrelationships (Leydesdorff and Fritsch 2005) where knowledge, resources and capabilities are exchanged.

In contrast to open innovation with its strategic view on firms that create superior economic rents from innovation, the outcome of innovation systems is often modeled as shared knowledge gain from a 'non-linear learning process' (Asheim 2004). This is especially interesting to young ventures and SMEs with limited resources for basic research, as they often do not have their own R&D department or the necessary financial background for it. Therefore partnerships with established companies or collaborating in SME networks is seen as a possibility for combining complementary resources and thus create higher – but shared – innovation performance (Rothaermel 2001, 2002; Edwards, Delbridge, and Munday 2005). Networks are a double-edged knife because of the difficulty in attributing individual economic ownership that emerges from spill-over effects. As a substitution to the economic motivation, social production of knowledge is therefore seen as public responsibility and justification for public research funding. Still, it requires trust especially on the side of participating SMEs that benefits do outweigh cost in open innovation type collaborations.

SMEs especially fear losing technological competence as their sources of competitive advantage in collaboration with large firms. This is one reason why they would rather pursue cooperation at the commercialisation stage than at the creation phase (Lee et al. 2010). Lee et al. therefore suggest a network model with a trust building intermediary that facilitates the identification and matching of collaboration partners, the evaluation of collaboration projects and the development of an information database.

From the review so far, coordinating the interrelationship of creation and commercialisation of innovation emerges as the central concern of innovation in open networks. Another root motivation of open innovation is the lack of user orientation (Von Hippel 2005).While this is rather an effect of general lack of commercial orientation of R&D departments internal to large firms (Chesbrough 2003), it is for SMEs again a consequence of resource constraints that are limiting marketing and commercialisation possibilities. In the European public framework programme for innovation FP 7, the search for alternative combinations of the creation phase and the commercialisation phase of the innovation process is subsumed under the term Living Lab to which over 200 regions refer as 'environments for innovation and development where users are exposed to new ICT solutions in (semi-) realistic contexts, as part of medium- or long-term studies targeting evaluation of new ICT solutions and discovery of innovation opportunities' (Følstad 2008). With reference to the triple helix model the involvement of users in such co-creation process is called 'quadruple helix (public, private, government, and end user)' (Galbraith and McAdam 2011). The Living Lab is presented as a process coordinating innovation intermediary for '(1) closing the pre-commercial gap by manifesting initial demand for products and services, as well as (2) orchestrating the actions of disparate actors in order to gain critical mass for the creation of a product or service' (Almirall and Wareham 2011, 100).

There is broad agreement in literature that innovation processes in open networks are coordinated through a visible hand, often referred to as innovation intermediary. Fichter introduced

'networks of promoters in communities' and argues that structured processes in innovation systems do not emerge by themselves or through the invisible hand of markets, but have to be designed and managed (Fichter 2009). The intermediary is as well described as the broker and communicating entity between stakeholders of an innovation system, which typically have problems in finding the right innovation collaboration partner (Hargadon and Sutton 1997; Howells 2006; Lopez and Vanhaverbeke 2009; Shvaiko et al. 2010). Howells (2006) identifies further roles of 'intermediaries' as to 'perform a variety of tasks within the innovation process'. Bessant and Rush (1995, 101) add consultancy services as a main function of intermediaries 'which help to bridge the gap between technological opportunity and (often poorly articulated) user needs' (Bessant and Rush 1995, 101). Klerkx and Leeuwis point to the role of intermediaries to overcome various gaps among innovation system stakeholders that can lead to innovation system failures and reduced performance. They call for 'systemic intermediaries who connect the different components of international, national, sectoral and/or regional innovation systems' (Klerkx and Leeuwis 2009, 850).

Innovation intermediaries are described to provide a set of operative activities that link them to the network innovation processes, but literature provides only fragmented insight about the intermediary–process relationship. In contrast to supply chains, where seamless integration of partners into inter-organisational processes has been found equally important as process integration inside the firm (Chen and Paulraj 2004) there is little reported on how innovation intermediaries act as process managers or coordinators. The role as system level agent (Howells 2006) with an information and communication role has been studied, but it remains open whether an innovation intermediary remains passive with regard to concrete processes or actively engages as promoter or process manager. Do they only transfer knowledge and technology from one party to the other or do they also offer individual services to the stakeholders? A frequent conclusion is that the impact of intermediaries on the innovation process remains under-researched (Pittaway et al. 2004; Batterink et al. 2010).

This is equally true concerning the question of how intermediaries contribute to the creation of innovation processes. This is in contrast to supply chain management literature which provides various supplier selection models (Liang-Chuan 2009; Luo et al. 2009). Fichter describes that promotors contribute to their generation through micropolitical action (Fichter 2009), but there are doubts on how the intermediary should get involved with individual partners in concrete processes. Lopez-Vega and Vanhaverbeke (2009, 30) formulate the open research question '*How do companies identify, select and interact with innovation intermediaries?*' The pre-collaboration phase especially, with the search for and matching of potential partners, is little researched for innovation partnerships.

## 3. Research approach and case data

Our study follows an action research design (Susman and Evered 1978) to study the management of innovation processes in networks where the researchers are embedded in real projects and interact in real-life settings to help solving problems and learn from this experience (Ottosson 2003). This is a suitable approach for the given research question as it helps developing a holistic understanding of the identified problem (Coughlan and Coghlan 2002). The rigorous structure of action cycles with the four steps of problem analysis, action planning, action intervention and reflection helps organising research at the interface with practice and to separate scientific learning from practical problem solving. In a first, more explorative action cycle, we developed the pre-understanding for gaining insights to specific problems or situations (Gummesson and Van Maanen 2000). Our second action learning cycle is driven by deliberate planning of theoretically

Table 1. Research design.

| Setting | SME – network | SME – large firm |
|---|---|---|
| Sample | Five collaborations between SME and Living Lab | Two open innovation collaborations between large enterprises and start-ups (start-ups selected among 205 candidates) |
| Data collection per case | Two semi-structured interviews with CEOs and project managers<br>One mid-term report<br>One final report<br>1–2 personal meetings<br>>3–4 telephone/skype group conferences<br>>3 bilateral conversation<br>>50 email correspondence | Two semi-structured interviews (1 CEO, 3 innovation manager)<br>Four questionnaires<br>Seven personal meetings<br>>5 individual phone calls (mostly with young entrepreneurial firms)<br>Two organised matching events<br>>50 email correspondence |
| Data analysis | Document analysis<br>Cross-case analysis | Document analysis<br>Web content analysis<br>Cross-case analysis |



motivated interactions. Action reflection cycles were established in the form of regular meetings by the research team, the authors. In total we have engaged in seven cases which can be grouped in two settings, one in which SMEs cooperate with large firms, and the other where start-up ventures are supported in entrepreneurship networks. In the second cycle deliberate and explicit planning was enforced by project plans that were requested by European and national funding bodies.

As typical with action research, data collection in the study is accomplished in a number of complementary ways (see Table 1). Structured and semi-structured interviews were regularly undertaken to understand the network situation. From participating in projects, minutes of meetings, field notes from attended meetings and bilateral interactions as well as document analysis of email conversations, project plans and similar documents were collected. Data were subsequently coded and processed from which research relevant issues emerged, which gave rise to additional literature research. Through this the study is designed so that the research scope enhances by iterative learning cycles over time (Kock, McQueen, and Scott 1997).

### 3.1. *The study setting in European regions of knowledge*

The study takes place in Europe, where innovation networks are an explicit element of innovation policy. In 1999 Europe released the Lisbon agenda as its explicit innovation policy and again confirmed it in 2009. One of the pillars of this policy is the strengthening of regional innovation systems, networks, clusters or regions of knowledge (Röttmer 2011) because a majority of European innovations have been found to emerge from geographical areas with a high density of large and small firms, universities and research centres. Policy implementation is undertaken through a set of grant programmes from different European Commission Direction Generals (DG), which are the European-level analogy to state ministries. For example, DG Research has created the regions of knowledge programme, the aim of which is to strengthen innovation in regional networks. DG Information Society has created an action line 'Living Labs' in its information and communications technology (ICT) grant programme and so forth. National government programmes

increasingly align their policy objectives with the European level and create own programmes such as the German FHprofUnt-program, which aims at strengthening the position of universities of applied sciences in collaborative innovation networks especially with SMEs. All this reaches industry and universities in the form of public grant projects.

Most innovation networks are designed with an industry or technology focus. In our study, the automotive industry with its tiered supplier structure provided the setting for the SME–large firm cooperation, with an original equipment manufacturer (OEM) and a tier-1 supplier participating as large firms. The start-up network setting has a technology focus on applications for Europe's satellite navigation system GALILEO/EGNOS, the equivalent to the US geostationary positioning system (GPS). When operational in 2013 it is supposed to create over 100,000 jobs of which over 90% will be in application products and services provided by SMEs. DG Industry in the European Commission therefore stimulates start-up ventures and SMEs from the broadest possible range of application domains but from a limited, steadily increasing number of regions, to adopt satellite navigation technology in their product and service range.



### 3.2. *First action cycle exploration of start-ups collaboration in Living Labs*

The first two cases of this study were generated in reply to a business idea competition called Galileo Masters, which has been organised since 2006 in about 20 European regions in order to stimulate adoption of satellite navigation technology. Each region selects a winner and runner-up, from which a European winner is chosen. The prize is a package including a cash prize, European media coverage, free incubation services in one of the regions and potentially matching for venture funding. Both cases were regional winner teams and their projects, one in the location-based service industry with a mobile phone application that allows finding restaurants, public transport and other points of interest in a vicinity. The other case is in the agriculture industry with an application that allows farmers to automatically generate the legally required reporting on pesticide application to fields from combining position and applied amounts already on the tractor.

The first case emerged from a business planning lecture at university, while the second was generated by an existing SME. Both got in contact with one of the authors and were initially supported in their application process towards the Galileo Master competition. After their success they asked for further support with the next step in the innovation process, the development of the product based on their idea. We supported them in joining the regional Living Lab for this step. In both cases the same Living Lab got involved. The specific composition of technology institutions and universities did fit the location based service team so that they used the Living Lab throughout the product development and testing phase. The agriculture team did initial prototyping and user testing in the Living Lab for about one year and moved on for hardware development of the tractor on-board unit with selected global suppliers. Both teams emphasised the importance of appropriate and extensive testing to the success of their innovation. The location-based team continues to use the 'real-life' environment of the Living Lab for software and concept testing. Priority for the agriculture team switched to hardware testing for which the team was referred to the European Space Agency which provided the necessary facilities. Both ventures have achieved the market introduction milestone.

Action learning results from the first cycle is on the one hand, that action intervention namely occurred for overcoming gaps in the innovation process and that organising seamless processes in an open network benefited the SMEs most. On the other hand, the known issue of orienting innovation projects to user demand early proved highly relevant.

### 3.3. *Second action cycle of innovation collaboration in networks*

The second action cycle started in 2009 with action planning in the form of designing projects in reply to new calls for proposals from the public innovation programmes. The satellite navigation competition had successfully mobilised numerous innovative product and service ideas for some of which product development in Living Lab would provide valuable support. Therefore the intermediary organising the satellite navigation competition and the network of Living Labs agreed to team up as two stages of the innovation process that they call 'innovation highway' (Katzy and Turgut 2010). Institutionalising regular cooperation across Europe required considerable detail in process planning. For example, a special Living Lab prize was created and three first prizes were awarded to start-up teams, which became cases of this study. One case is a location-based eHealth application, the second is an application to help car drivers reduce $CO_2$ emission and the third is a city tourism application. Upon the selection of the idea winners all European Living Labs were invited to submit their application for hosting field trial and prototyping. From all submissions, one Living Lab was selected as partner for each start-up team and awarded a grant to partially cover the cost of executing the next stage. Expectation is that in the selected Living Lab the promising idea will achieve the milestone of prototype development and validation through its user community. Action intervention in this phase was for example during a first introductory get-together of interested Living Labs with the prize winning start-ups, contribution to process development and the development of selection criteria for business ideas and Living Labs, contribution to the agreement between start-ups and Living Labs, and eventually coaching of the collaboration process.

At the same time, interest in understanding and developing collaborative innovation processes with SMEs was voiced in the automotive industry. Car manufacturers and their first tier suppliers typically assume the coordination role for large supplier networks and constantly search for new SMEs to join. Problem analysis showed that the large firms face challenges in establishing the innovation network for several reasons, e.g. because finding the right SME is difficult and costly especially when they come from remote industries. In addition, reluctance of SMEs to engage with the much larger enterprises posed an obstacle. The focus of action planning, which again was documented in a project plan, was therefore on designing innovation processes that are facilitated by neutral intermediaries, which in the overall structure is not much different from the satellite navigation competition where as well large firms do offer their resources to find and invite start-ups and SMEs for collaboration. The two concrete cases of our study are first an exploratory study where the marketing department of the established company is searching for new services and technologies for future positioning of their products in new market niches with new business models. The other project is from a manufacturing department that is in search of unconventional solutions for a defined technological problem in the production process. In both cases, action intervention entailed innovation process engineering, support in the definition of objectives, search of suitable SMEs and establishment of the collaborative relationship.

## 4. Findings and discussion

From our action involvement three research issues emerged: (1) the role of the involved innovation intermediaries shifted away from neutral facilitation towards engaged innovation process management, which raises questions on the nature of open innovation processes; (2) matching complementary resources of the network partner and integrating them into a coordinated innovation process is an important capability; and (3) valuation of innovation projects at all stages and

management of the project portfolio, which could provide a solution candidate for the 'funding paradox' (Klerkx and Leeuwis 2009) for intermediaries in that it provides financial measure of performance from which revenue models can be derived.

### 4.1. *Innovation process management capability*

The original plans to establish collaboration between the satellite navigation competition participants and the Living Lab had foreseen support to demonstrate the process in a first round after which the cooperation projects were expected to be self-coordinating. Experience showed quickly, however, that collaboration partners had an essential demand for continuous collaboration support and process management so that new plans have been drafted to incorporate their requests for future years. The large firms in the automotive industry voiced similar expectations:

> *… I expect you to have a portfolio of start-ups and a structured process […] like the professional agencies which already offer similar services ….* [meeting/field note]

In fact, all industrial partners did call for an 'intermediary' not unlike how they are described in innovation management literature (Howells 2006; Batterink et al. 2010). Namely the expectation was to integrate various functions along the innovation value chain (Hansen and Birkinshaw 2007; Roper, Du, and Love 2008) toward concrete outcomes. In contrast to the literature, which mostly assumes that innovation processes are internal to one organisation, open innovation processes are in the inter-organisational network environment, which however did not moderate expectation on coordination efficiency. Table 2 summarises what expectations firms openly addressed towards the intermediary. In none of the projects had the role for such an intermediary been pre-assigned during action planning. Only during action reflection did it emerge that such a coordination function in the innovation value chain is only addressed implicitly, if at all.

Table 2. Innovation process coordination perception by case managers.

| | Start-up | SME | Big firm |
|---|---|---|---|
| Commercial broker services | Limited attractive for partner finding, owing to limited financial resources | Moderate attractive for solution finding, within limits of financial resources | Very attractive for solution finding and full service provider |
| Network facilitation services | Very attractive especially in form of publicly financed coaching services | Attractive especially as consulting services, but sometimes limited by financial resources | Very attractive as full service provision of external idea sources |
| Broker services | Very attractive for further value creation, owing to the fact, that early stage innovation is valuated | Very attractive for running the innovation process more efficient through network access | Very attractive for running the innovation process more efficient and fast partner finding |
| Collaboration services | Promoting contacts with decision makers in large firms or network | Promoting access to collaborative network facilities, innovation partners and complementary resources | Efficient identification of innovations and qualification for cooperation of partner and solution |

*… I need more transparency for a better understanding […] how you systematize the profiling of our requirements and the search for new ventures …*. [personal interaction/field note]

In a series of action-intervention meetings firms stressed the importance of explicit explanation of the innovation activities from which the process description in the upper part of Figure 1 emerged as a blueprint for running projects. In other words, partners in the innovation process approached innovation intermediaries as service suppliers and requested certainty on approaches, quantified prospects of results, as well as business references. In the course of the study, we observed that intermediaries listed in the lower part of Figure 1 describe projects, like the seven cases in which we participated, as their reference portfolio.

A priority in the discussions was the structuring of the innovation process to generate marketable intermediate results. The intermediaries involved did have a history in providing support and facilitation, e.g. as university incubator offering a wide range of start-up consultancy services, but those activities are not prepared to demonstrate results with realised value, making it impossible for firms to quantify economic value of collaboration with the incubator's portfolio. This changed with providing a first economic value to business ideas in the form of the cash prize, of project investment plans for the Living Lab trials and later valuations in financing rounds with investors. It became the role of the intermediary to demonstrate outcomes of stages of the innovation process and steer to have them validated by closing 'deals' between supplier and customers. The process manager in this way is a deal-flow manager visualising the value for all involved stakeholder to make deals happen. Identifying the right partners for such deals proved a highly debated issue in this context.

### 4.2. *Matchmaking capability*

Collaboration between participants of the business idea competition and Living Labs led to different outcomes for both teams: while it resulted in efficient prototype development in both cases, the European Space Agency and international hardware providers proved to be the right partners for the agriculture team's next development phase. The location-based team continued cooperation with the Living Lab. Based on this experience the process was organised more precisely in the second action research cycle: detailed criteria were established and the process was supported by the experts from the intermediary. The more successfully the intermediary organisations matched the

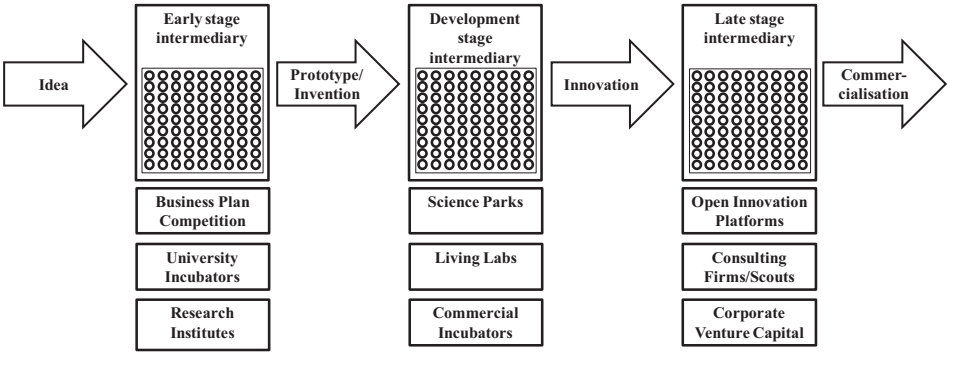


Figure 1. Innovation process model.

collaboration partners the more visible the efficiency of those intermediaries; or, as one manager put it:

> *Our problem is not to find sufficient innovation partners; we need to understand how to find the right one, because searching for suitable partners interferes with the actual innovation!* [meeting minutes]

Matchmaking is more than searching the right partner and a subsequent market transaction. The cooperation decision is a complex group decision-making process, in that managers are aware that the cooperation decision is path establishing (Sydow, Schreyögg, and Koch 2009) in that it is often bundled with decisions about technology or business model alternative that determine the future innovation direction. More research is needed to understand not only the strategic implications of this decision but also its group dynamics. A frequent request was to support the dynamics through social media and to allow for higher dynamics of the process.

### 4.3. *Valuation and portfolio management capability*

Besides the individual projects, it was the critical mass of concurrent projects on which the innovation networks of the study did thrive. It was the capability of the intermediary to translate the combined value of a portfolio of individual deals into individual benefits of the stakeholder in several ways.

The likelihood of finding matching partners for the initiation of a new innovation collaboration project increases with the number of available partners in the network. All intermediaries in the study therefore engaged in building critical mass portfolios. In this way the satellite navigation competition did invest in establishing a network of experts capable of assessing business ideas, just as the Living Lab network invests in laboratory infrastructure and user communities with different interests and qualification.

Portfolios of active and past deals as symbolised by the circles in the centre of Figure 2 were equally as carefully composed as the above-mentioned portfolios of the sources from which the deals can be matched. Portfolios of more than one hundred business ideas in the business idea competition or prototype developments in Living Labs each year allow analysis on technical and business trends. Knowing about similar projects prevents repeating experiences or double work and provides an insight on achieved technical capabilities and unsolved issues and challenges.

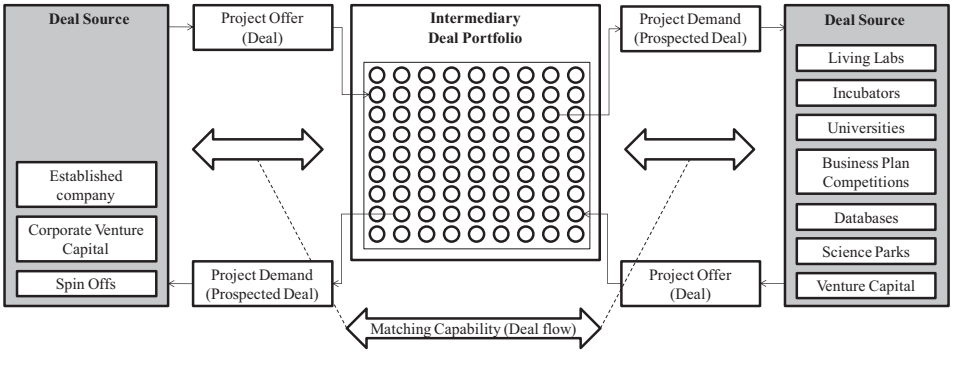


Figure 2. Deal flow portfolios for intermediaries.

The flow of deals, the number of successfully completed matching projects, at the same time proved a strong competence signal on the side of the intermediary. It can be used to evaluate the performance of intermediaries and can be measured by the size or value of the deal portfolios or the number of realised deals.

Deal flow portfolios establish financial valuations and therewith open ways for intermediaries to participate in the value created. In the course of the project two of the intermediaries entered into formal share participation of undertaken projects. It is too early to judge on the practical impact of such a mechanism, but it introduces the concept of building a position for intermediaries in the innovation value chain based on a share of the value created. Future research will need to address the question of how to establish those portfolios – in particular for not-(yet)-commercialised intermediaries.



## 5. Conclusions and future research

This paper explores open innovation processes through the depth of getting involved in seven cases of an action research study. All cases have in common that innovation intermediaries contributed to the establishment of the collaboration and the management of its operations. In some cases online innovation market places were used for selected stages but obviously explicit coordination was needed to integrate the innovation process. This coordination was provided to the studied networks by intermediaries that offer a wide range of known consulting and facilitation services (Howells 2006). Such facilitation is often provided through public funded agencies with no commercial intent. In the cases described here, however, intermediaries increasingly developed strategies to build viable positions in the innovation value chain. In this respect the study addresses a research gap on coordination in open innovation (Dahlander and Gann 2010).

In conclusion we saw that the prevailing facilitating rationale for intermediaries is replaced by a value creation rationale in the innovation value chain. Intermediaries developed capabilities of identifying collaboration partners, matchmaking, innovation process management and making innovation valuations visible in deals between innovation suppliers and customers. Investment in capability building was accompanied with a shift of revenue models from publicly funded facilitation to collecting transaction fees and taking co-ownership of innovations in the early phase, from which we hypothesise the existence of a strategic position of open innovation coordinator.

This study shares the limitations of naturalistic inquiries which provide deep insight in a small number of cases. Even more so, the study explores cases of recent changes of strategic behaviour of intermediaries that are motivated by practical need and the publications on the concept of open innovation. More research will be needed not only to generalise the findings through quantitative studies, but more qualitative studies are also needed to chart the evolution of the phenomena. Even if the phenomena should prove transient, it contributes an opportunity for theorising on the coordination of innovation processes. In this line there are more opportunities to research into open innovation processes and the strategic capabilities of partners in the value chain.

The paper makes a practical contribution to corporate innovation managers in defining their cooperation with partners in innovation networks. Notably it makes a contribution to research policy makers and decision makers, who search for alternatives in funding schemes, and strategic decision makers who search for sustainable business models for innovation intermediaries where public funding alone is no longer a reliable revenue source. The advice from this paper is to develop complementary market-based revenue streams from holding a portfolio of innovation projects.

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