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Decisions in Doubt – Weighing Pros and Cons of OI Projects

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Abstract: The positive aspects of Open Innovation projects are widely discussed in innovation management research and practice by means of case studies and best practices. However, enterprises, particularly SMEs also face miscellaneous challenges in Open Innovation practice, leading to uncertainty and even renunciation of OI project participation. Thus, it is essential for SMEs to find the right balance between positive effects and possible negative consequences ("dark sides") of Open Innovation project participation. However, appropriate methods are still lacking. This paper discusses the hubris of *ex ante* assessment of Open Innovation project participation by presenting a conceivable solution approach. As a result, a methodical Open Innovation project assessment procedure is presented.

Keywords: Open Innovation, OI Participation, Guidance Application, Risks, Benefits

1 Introduction

The advantages of Open Innovation (OI) projects are widely discussed in innovation management research and practice (e.g. Man/Duysters, 2005). Particularly, small and medium sized enterprises (SMEs) are expected to gain most from OI collaborations due to their inherently limited capabilities (Lee et al. 2010, van de Vrande 2009). However, these enterprises also face manifold challenges in OI practice, leading to uncertainty and even renunciation of OI project participation. Thus, SMEs often deal with the decision dilemma of having to cooperate with external partners in order to improve their own innovation capacity, regardless of their ability to cope with the correlated risks.

Although it is essential for SMEs to find the right balance between positive effects and possible negative consequences ("dark sides" of OI (Huizingh, 2011)) of OI project participation, appropriate methods are still lacking.

The research project "Open Darkness" was initiated with the goal of enabling SMEs to weigh the risks and benefits of OI participation by developing (1) a methodical

procedure and (2) a guidance application which structures and supports the decision process. In order to tackle these targeted outcomes, an interdisciplinary (legal, innovation and knowledge management) consortium facilitates a multi-perspective and an integrated holistic research approach.

Given the importance of strategic thinking and of tacit knowledge in decision making, decision outsourcing from a person to a tool is inherently erroneous. Accordingly, it is explicitly not intended within the application to automate and process decisions, thereby removing human responsibility. Thus, it is envisaged, to reduce insecurity in decision making for OI participation by providing a support structure, which identifies causalities and alternatives and leads to the identification of action alternatives.

The goal of the present paper is to discuss the hubris of an *ex ante* assessment of OI participation against the background of the impossibility to either predict the future or to capture all necessary environmental information as well as the serious need of SMEs for aid in this matter. This will be conducted by explicating a conceivable solution approach for a methodical assessment procedure and put it up for discussion.

The paper is organized as follows: Section 2 emphasises relevant theoretical aspects of OI. Section 3 describes the methodological approach within the study, Section 4 depicts a possible solution and the conclusions are exemplified in Section 5.

2 Specify the Problem

According to conventional understanding, primary causes for successful and innovative enterprises are their employees, R&D divisions, and a fault-tolerant corporate culture. This kind of innovation refers to the closed innovation paradigm (Chesbrough 2003). Due to an increasing trend towards globalisation, new market participants and simultaneously shorter product life cycles with correspondingly increasing R&D costs, the closed innovation paradigm was superseded last century (Gerybadze and Reger, 1999) by the theory of open innovation, which emphasizes the significantly higher importance of external resources (Chesbrough 2003).

Bright and Dark Sides of Open Innovation

Open innovation "is the use of purposive inflows and outflows of knowledge to accelerate internal innovation" Chesbrough et al. (2006, p.1). Thus, OI can be described as an interactive and collaborative innovation process with external partners (Veer et al. 2013).

The positive aspects of OI for SMEs are widely discussed (Lee et al. 2010). Table 1 depicts some of these OI "bright sides", structured into the categories: organizational, knowledge management, legal aspects.

Table 1 The bright sides of OI

Organisational	*Knowledge Management*	*Legal*
Diversification of R&D investments	Broader base of ideas	Use of intellectual property as strategic assets
Easier market entry	Technological synergy effects	Monitoring of the uncertainty of value and protection level of others' patents
Resource acquisition advantages	Improvement of the internal learning capacity through the transfer of external knowledge and learning routines	

Source: Own representation following the above cited references.

Comparatively, the so called "dark sides" (cf. Table 2) of OI processes (cf. Veer et al., 2013; Enkel et al., 2009) have thus far been neglected (e.g. the legal OI relevant aspects are even not structured or placed under the umbrella of OI research (Müller, 2013)).

Table 2 The dark sides of OI

Organisational	*Knowledge Management*	*Legal*
Process coordination costs	Strong dependence on external knowledge	Lack in legacy for additional tasks
OI implementation costs	Loss of key knowledge control	Intellectual property spillover
More faults in routine workflows	Loss of flexibility, creativity and strategic power	Different levels of contractual experience compared to big enterprises (as potential partners)

Source: Own representation following the above cited references.

Evaluation in Innovation Management

Broad evaluation is a crucial challenge of innovation management (cf. Adams et al., 2006), particularly for assessing an enterprise's situation and developing suitable improvement measures. Existing approaches focus either on isolated aspects of innovation management such as idea evaluation or consider the innovation process as an internal activity (Afuah 2003). They can however be adapted for OI processes.

Business modelling with a focus on knowledge intensive processes (such as innovation processes) provides another path to analyse and evaluate the current situation in an enterprise. Although OI literature describes innovation processes with specific phases, in reality, SMEs innovation processes are often unstructured. Thus, such an analysis is an essential starting point for evaluating knowledge and information flows, business processes and personnel interactions (Gronau 2012).

Conclusions and areas requiring further research

The openness of innovation processes is associated with uncertainty regarding positive and negative consequences of the project design. Thus, enterprises often need methodical support within the decision process of OI project participation. However, according to a conducted literature review, no approaches for weighing the risks and benefits of OI project participation exist.

3 Tackle the Problem

The lack of a decision support framework for weighing benefits and risks of OI participation leads to the contributions' underlying question:

- In terms of a decision support guidance application for SMEs - to evenly capture, analyse, and weigh chances and risks of OI projects - how should an evaluation methodology be designed?

Methodological approach within the study

To ensure theoretical and practical relevant aspects within the evaluation methodology and the guidance application are not neglected, the research design includes a combination of qualitative, quantitative and software development methods:

1. A literature review on the following topics: phases and evaluation of OI processes in SMEs, internal and external knowledge interfaces, conditions of participation, measures for participation and risk reduction, positive and negative aspects of OI.
2. Modelling and analysis of existing OI processes for 15 SMEs, on the basis of >35 interviews with decision makers and employees. The main result of Step 2) combined with Step 1) is the identification of OI process assessment indicators for SMEs including knowledge management, organizational, and legal aspects.
3. Indicator evaluation, through a survey and interviews with OI experts. Part of this step is the establishment of a community of OI experts, which acts as a supervisory body and validation group.
4. Development of a methodological procedure with the aid of an evaluation catalogue, ratio systems and implementation procedure models for SMEs.
5. Requirements determination and development of the guidance application, based on the SCRUM software development framework.

4 Approaching a Solution

Due to the wide heterogeneity of OI situations and innovation processes it would be foolhardy to assume that a software tool could take the entrepreneurial decision and, thereby, simply solve the complex decision problem of OI participation. Hence, a solution needs to assist SME innovation managers by providing them with an evaluation methodology to guide through the weighing process and enable a comprehensible

decision. The methodology (cf. Figure 1) is structured in 5 steps, which are described below:

1. **Identification of innovation goal, degree of innovation, risk propensity, and strengths and weaknesses analysis:** Primary and secondary value chain activities constitute the framework to identify enterprises' OI specific strengths and weaknesses (e.g. innovation project experience, own innovation process structure, resource allocation). Profile tables and process analysis models will be used for these queries.

   The innovation goal will be divided into output, input, and process goals; the degree of innovation into incremental, radical and corporations' innovation intensity. The risk propensity categories are: risk seeking, -averse, -neutral. These aspects will be queried by closed direct or indirect questions.

2. **Identification of benefits and risks as well as assessment of their occurrence probability:** Specific risks and benefits of OI cooperation will be prompted by using a predefined catalogue. Additionally, their respective occurrence probability will be estimated by indirect closed questions e.g. regarding past experiences with project partners, criticality of knowledge and information and assessment of their actual situation and existing protection measures.

   Within phase 1 and 2, indirect questions will be used to determine the enterprise's ideal-typical degree of openness. In addition, enterprises will be enabled to specify their OI goals and relate specific project benefits directly to them.

3. **Assignment of measures to benefits and risks:** Analytical findings will be considered to identify potential need for and comparative advantages of protection measures. Thus providing the basis for the assignment of relevant measures. If each risk and each benefit can be associated with corresponding specific measures in order to either avoid or enable them, (1) already existing enabling or protection measures within the enterprise will be discovered and (2) missing measures and necessary investments and efforts for their establishment will be revealed. Based on the present innovation process structure, potential partner profiles, knowledge and information flows, and legal situations, the enterprises' risk position will be clarified.

4. **Presentation of analysis results:** Based on the evaluation of the aforementioned steps three major results will be depicted: (1) the optimal degree of openness (by the aid of a type classification proximity/formalization (Diener 2015)), (2) expectable efforts for necessary, promising and risk propensity dependent measures to enable context-specific optimal degrees of openness and innovation and 3) depiction of advantages and disadvantages of the OI corporation project under consideration.

5. **Come to a decision:** Condensed information will be provided and decision made.

This framework fulfils three functions (1) provision of understanding for the present situation and within this (2) reduction of the perceived risk of OI project participation and

(3) general recommendation for action which serves as decision support for the innovation manager.

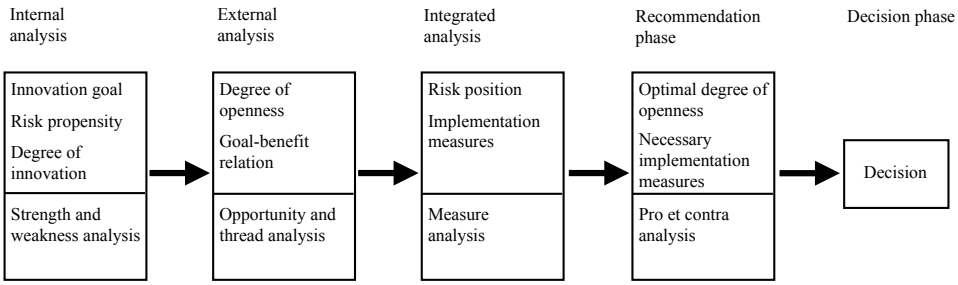

Figure 1 Methodical assessment procedure for OI projects.

The methodology described aims to expose the current OI situation and future OI goals of SMEs by addressing and answering the following question regarding a concrete OI project: How structured is the current (OI) process? How open could and should the innovation process be? What specific risks regarding i.e. potential partners, knowledge and information losses exist? What is the level of preparation required to avert these risks? What kind of improvement can be expected from cooperation with external partners?

The methodology can provide a broad, evaluative foundation to assist with the complexity of the decision making process, but it cannot provide a definitive answer to the closing question: Whether or not to participate in an OI project?

5 Conclusions and Outlook

Whether a decision made in doubt was really good, accurate, or solely sub-optimal, remains highly subjective simply because of the lack of the opportunity to compare real-world situations. There is only one real time occurrence and no reliable further information about alternative scenario developments available. Thus, guiding entrepreneurial decision processes is particularly beneficial (Simon 1979).

Although there is a plenty of research dealing with the assessment of positive aspects of OI processes as well as some research with emphasis on the "dark side" of OI, the novelty of this approach is the analysis on the interdependencies of both facets and their combined impact on the OI project's chances of success.

SMEs are particularly addressed because they are economical backbones and will benefit more than corporations with economies of scale. Whilst facing similar challenges, each is unique and requires tailored recommendations for improvement.

After establishing the theoretical background, the approach and the process model, the next steps include their evaluation from the practical point of view. This is ensured by a close collaboration with enterprises (especially SMEs) and innovation experts.

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Areas for feedback & development

Is the methodological approach appropriate to answer the research question?

Which requirements should the guidance application meet?

Which further aspects have to be considered within the evaluation methodology?