
OI - risk and chances: Theoretical evidence meets practical relevance

André Ullrich*

University of Potsdam, August-Bebel-Str. 89, 14482 Potsdam,
Germany.
E-mail: aullrich@lswi.de

Gergana Vladova

University of Potsdam, August-Bebel-Str. 89, 14482 Potsdam,
Germany.
E-mail: gvladova@lswi.de

Marcus Grum

University of Potsdam, August-Bebel-Str. 89, 14482 Potsdam,
Germany.
E-mail mgrum@lswi.de
* Corresponding author

Abstract: This paper presents a study that aims to investigate which chances and risks of Open Innovation (OI) projects are of practical relevance and how is their respective weighting. The specific goal of this submission is the discussion of the current understanding of the relevance of particular chances and risks for the open innovation projects success, based on empirical study results. For this purpose, a survey was conducted to gather data sets that have been analyzed afterwards. In the light of potential open innovation project participation, enterprises need a well-structured decision-making basis. Thus, they can use the opportunity to compare their own understanding regarding the importance of particular chances and risks with the understanding of other OI-experts.

Keywords: Open Innovation; OI Participation; Chances; Risks; Empirical Survey.

1 Introduction

Enterprises, particularly small and medium sized (SMEs) are expected to gain most from Open Innovation (OI) collaborations due to their inherently limited capabilities. However, they also face miscellaneous 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.

The advantages as well as the „dark sides“ of OI projects are widely discussed in innovation management research and practice (e.g. Man and Duysters, 2005). Although

various chances and several risks are stated in OI research, they have not yet been comparatively surveyed. Thus, generalizable statements regarding the weighting of the chances and risks as well as evidence regarding their respective practical importance are missing. However, in the light of potential open innovation project participation, decision makers need a well-structured decision-making basis.

This paper presents a study that aims to investigate which chances and risks of OI projects are of practical relevance and how is their respective weighting. The specific goal of this submission is the discussion of the current understanding of the relevance of particular chances and risks for the OI projects success, based on the empirical study results. For this purpose, a survey was conducted to gather data sets that have been analyzed afterwards. Result of this paper is an overview of chances and risks of OI projects and their respective weighting, that are considered as relevant from a practitioners perspective.

The remainder reads as follows. Section 2 emphasises relevant theoretical aspects of OI. Section 3 describes the methodological approach of the study, Section 4 illustrates and discusses the results, and the conclusions are exemplified in Section 5.

2 Risks and chances of OI

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 by the theory of Open Innovation, which emphasizes the significantly higher importance of external resources (Chesbrough 2003).

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, e.g. risk reduction through error compensation and investment sharing, cost advantages, wider development potential, increased market penetration, application of so far unused technologies, are widely preferred topics in the literature (e.g. Lee et al. 2010). Table 1 depicts some of these OI “chances”, structured into the categories: *organizational* and *process-related*.

Table 1 Chances of OI

<i>Organizational</i>	<i>Process-related</i>
Diversification of R&D investments	Availability of external experts
Technological synergy effects	Shorter product development times
Benefit from foreign cultures	Identification of further potentials

Source: Own representation following the above cited references.

On the other hand, the risks (cf. Table 2) of OI projects, such as high transaction costs, difficulties in finding the right partner, insufficient time and financial resources, leakage of critical internal resources (e.g. Huizingh, 2011; Veer et al., 2013) is also important.

Table 2 Risks of OI

<i>Organizational</i>	<i>Process-related</i>
Opening of enterprise boundaries	Decreasing innovation capability
OI implementation costs	Slower product development
More faults in routine workflows	Pursuing unattractive ideas

Source: Own representation following the above cited references.

As briefly introduced above, several chances and risks of OI project participation exist in literature and in practice. However, it is not clear which are the most important risks and chances from a practitioner's point of view.

3 Methodology

The present study is part of a research project (cf. Vladova and Ullrich 2015) that aims to enable enterprises, especially SMEs to weigh up 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. For this purpose, the identification of practical relevant chances and risks of such projects as well as their respective weighting are necessary steps.

With this in mind, firstly, a literature review regarding chances and risks, phases and evaluation of OI processes, internal and external knowledge interfaces, main actors, positive and negative aspects of OI was conducted to establish a theoretical background. Additionally, an analysis of real OI processes of 15 SMEs, on the basis of 35 interviews with decision makers and employees regarding occurred chances and risks, was conducted. Afterwards, the planning and preparation of the empirical study, emphasizing the determination of the survey method, the construction of the survey, the specification of the study design and a pretest, took place (Fig. 1).

The survey was conducted to collect and analyze the practitioners' perceptions towards the chances and risks of OI projects in the period from June to August 2016. The tool "lime survey" was used to create and host the survey. Using contact databases from research organizations in the DACH-area (Germany, Austria, Switzerland), the link to the online survey was distributed via email to 24.312 target group recipients in total. 348 data sets were responded, which constitutes a respondent rate of 1,44% after two waves of solicitations.

Of the total 348 responses, 112 were removed, 65 dropouts occurred after completion of the demographic information. Correspondingly, the number of relevant data sets lies between 171 and 155.

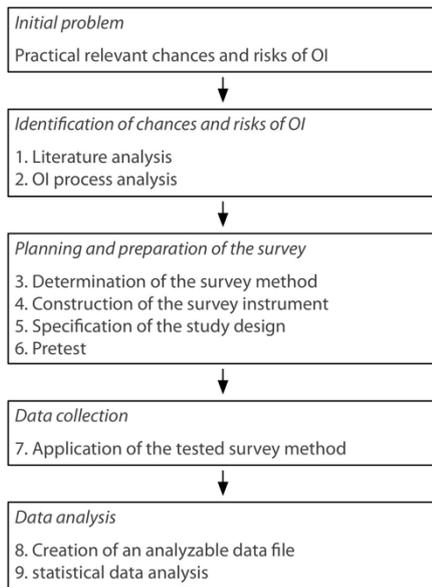


Figure 1 Methodological approach.

4 Results and discussion

With the intention to gain insights about the practitioners' perception of OI chances and risks, the following, firstly, introduces an overview about the demographic structure of the participants. Secondly, tables are presented that show the general perception of chances and risks.

Fig. 2 (a) visualizes the allocation of the participants to enterprise size categories. 36% of the participants are working in enterprises having less than 50 employees, 47% in enterprises with more than 250 employees and 17% belong to sizes in between. Fig. 2 (b) illustrates in which industrial sector the participants work. Sectors that are mostly represented are: information and communication technology (34%), automotive (5%), chemical industry (5%), and machinery and equipment industry (5%).

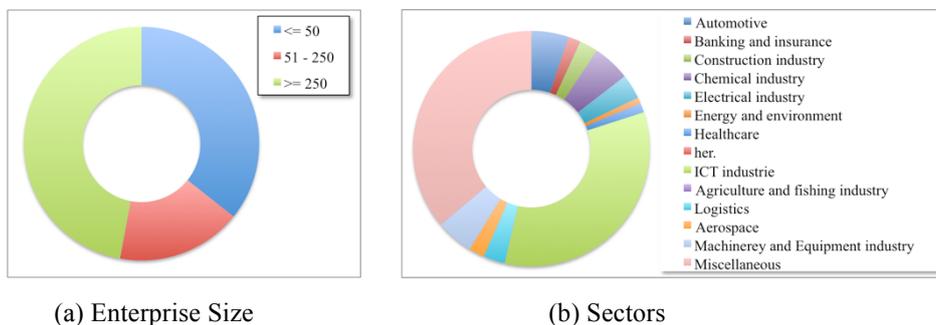


Figure 2 Demographic overview of participants.

Tables 3 – 6 visualize the general perception of chances and risks of OI projects over all survey participants. Each is showing the chance or risk, the *n*, and the percentage agreement of the participants to the respective chance or risk with respect to the question if this chance or risk is relevant for a successful realization of OI projects.

Table 3 depicts the respective percentage relevance of 19 organizational chances. Assuming that every item with an agreement of more than 75% is considered as very relevant, an agreement between 50% and 74,9% as relevant, and an agreement less than 50% as little relevant, ten chances can be identified as very relevant, seven as relevant and two as little relevant. By average, the items have a relevance of about 72%.

Table 3 Organizational chances.

<i>Organizational chances</i>	<i>n</i>	<i>%Agreement</i>
Inclusion of external experiences	170	97.1%
Expansion of the own knowledge base	170	94.7%
Filling of internal knowledge gaps	170	90.6%
Access to new product- and production technologies	170	88.2%
Improvement of market knowledge and market requirement detection	171	84.8%
Technological synergy effects	171	83.6%
Extension of the own range of products and services	171	82.5%
Benefit from the partner's network	170	82.4%
Advantages in technology transfer	171	79.5%
Achievement of a higher market acceptance by reference effects	171	76.6%
Usage of the partner's intellectual property as a strategic asset	171	71.3%
Improvement of the organizational culture	170	66.5%
Better forecasting of future developments	171	65.5%
Easy benchmarking of competitors	171	55.0%
Benefit from foreign cultures	170	54.1%
Risk diversification	170	52.4%
Usage of competitive synergies	170	51.2%
Enforcement of standards and designs for new products	171	48.5%
Synergy gains by patent pooling	170	46.5%

Table 4 depicts the respective percentage relevance of ten process-related chances. Four items can be identified as very relevant, four as relevant, and two as little relevant. By average, its elements have a relevance of nearly 66%.

Table 4 Process-related chances.

<i>Process-related chances</i>	<i>n</i>	<i>%Agreement</i>
Availability of external experts	164	93.9%
Increasing the innovation performance	164	90.9%

Improvement of products or services	164	87.2%
Identification of further potentials during the innovation process sequence	164	83.5%
Enrichment of project evaluations with various facets	164	59.8%
Establishment of a multifaceted decision making	164	58.5%
Shorter product development times	164	57.3%
Process improvements by process design by the partner	164	50.0%
Faster time to market	164	45.7%
Usage of the advantages of external IT infrastructures	164	31.7%

Table 5 depicts the respective percentage relevance of 17 organizational risks. Two items can be identified as very relevant, ten as relevant, and five as little relevant. By average, its elements have a relevance of nearly 54%.

Table 5 Organizational risks.

<i>Organizational risks</i>	<i>n</i>	<i>%Agreement</i>
Selection of wrong partners	158	80.4%
Unclear communication of OI goals	158	75.9%
Insecurities regarding inclusion of the external partner	158	66.5%
Unintended knowledge drains	158	63.9%
Coordination problems	158	62.7%
Partner specific threads	158	62.0%
Lack of cultural values	158	61.4%
Integration of security-critical partners	158	58.2%
Rejection of the process opening by employees	158	54.4%
Inefficient resource allocation	158	53.8%
Submergence of enterprise and OI strategy	158	52.5%
Opening of enterprise boundaries	158	50.0%
Dependence on external alliances	158	43.7%
Increase of the employee's needs for training and motivation	158	41.1%
Monetary inefficiency	158	39.9%
Information overload	158	32.9%
Financial bottlenecks	158	20.9%

Table 6 depicts the respective percentage relevance of eleven process-related risks. None risk can be identified as very relevant, one as relevant, and ten as little relevant. By average, its elements have a relevance of nearly 40,9%.

Table 6 Process-related risks.

<i>Process-related risks</i>	<i>n</i>	<i>%Agreement</i>
Delays with effects on the project progress	155	63.2%

Inefficient integration of internal and external IT systems	155	49.0%
Insecure and wrong decision making by more complex decision structures	155	47.1%
Unused result potentials	155	41.9%
Non-consideration of innovation potentials during the process sequence	155	40.6%
Pursuit and realization of unattractive ideas	155	40.6%
Slower product development	155	38.7%
Outflow of employees with expert knowledge to the partner	155	38.1%
Deficits in project evaluation by wasted potentials	155	34.2%
Inefficiencies in production and distribution	155	33.5%
Decreasing innovation capability	155	22.6%

The analysis of the results shows that the current understanding regarding existing chances and risks found in the literature corresponds to the chance-risk-perception of the OI-enterprise practice. Furthermore, the agreement regarding the best-rated chances is more consistent (starting by an agreement of 97%) than which regards the best-rated risks. Knowledge – tacit (e.g. external experts and expertise) as well as explicit (e.g. information, technology and products) – remains the most important issue within the OI-concept. On the other hand, unintentional knowledge leaks are also one of the most important risk factors, together with (as well as a part of) the insecurity regarding the selection of appropriate and trustful OI-partners and the communication with them. In contrast, the voice of the practice identifies possible general synergy effects (competition, patent pooling, infrastructure) as less important chances. Regarding the risks, monetary and financial risks especially have been assessed to be well controlled. Respectively, for the process risks dimension can be concluded that the flow, outcome and quality of internal innovation processes have not been deeply impacted by the cooperation with external partners.

5 Conclusions

This paper presents first empirical findings regarding the practitioners' perspective towards chances and risks of participating in OI projects. Emphasis, hereby, lies on the studies' methodology, the data set, and the respective relevance of the chances and risks.

The novelty of this study lies in its structured empirical assessment. The results represent the current understanding of innovation managers and workers regarding the impact of the chances and risks on OI project's success.

The results enable SMEs to gain an understanding of which aspects they particularly have to focus on. Enterprise can use the opportunity to compare their own understanding regarding the importance of particular chances and risks with the understanding of other OI-experts.

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References and Notes

Chesbrough H. (2003) *Open Innovation. The New Imperative for Creating and Profiting from Technology*. Boston.

Chesbrough H.W., Vanhaverbeke W.P.M and West J. (Eds) (2006) *Open innovation: Researching a new paradigm*. Oxford University Press, Oxford.

Enkel E., Gassmann O. and Chesbrough H.W. (2009) *Open R&D and open innovation: exploring the phenomenon*. *R&D Management* 39 (4), 311–316.

Huizingh, E.K.R.E. (2011) *Open innovation: State of the art and future perspectives: Open Innovation - ISPIM Selected Papers*. *Technovation* 31 (1), 2–9.

Lee, S., Park, G., Yoon, B. and Park, J. (2010) *Open innovation in SMEs—An intermediated network model*. *Research Policy* 39 (2), 290–300.

Man, A.-P. de and Duysters, G. (2005) *Collaboration and innovation: a review of the effects of mergers, acquisitions and alliances on innovation*. *Technovation* 25 (12), 1377–1387.

Veer, T., Lorenz, A. and Blind, K.B. (2013) *How open is too open? The „dark side“ of openness along the innovation value chain*. 35th DRUID Celebration Conference.

Vladova G. and Ullrich A. (2015) *Decisions in Doubt – Weighing Pros and Cons of OI Projects*. In: Huizingh KRE et al. (Eds.) *Proceedings of 7th ISPIM Innovation Symposium*, Australia.

Areas for feedback & development

Do the results meet your expectation regarding the importance of particular chances and risks and if not how could you explain the differences?

Do you agree with the process orientation of our research design or are there other possibilities to structure the practical investigation of chances and risks?