The relevance of stakeholder analysis for Open Innovation

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Open Innovation (OI) opens a company's innovation process to its environment and enables the purposeful collaboration with external partners, such as suppliers, customers, consumers, universities or even competitors. This allows the utilisation of external expertise and creativity. In a qualitative study, we identified the selection of suitable OI-partners as one of the main challenges for companies conducting OI – especially when no or only little experience with OI. A common mistake is focussing only on OI-partners for solving the (technical) task and neglecting strategic-political relevant OI-partners. This could mean that only users of a product were involved while the actual buyers of the product were another group and not involved. However, another mistake was focussing on external OI-partners and not considering internal OI-partners sufficiently, such as employees or superiors.

Thus, we developed an OI-specific approach for identifying relevant OI-partners for an OI-project. Besides identification methods from OI and Lead-User approach for assessing the "technical" solution-oriented skills and expertise of OI-partners, stakeholder analysis assesses their strategic relevance. At the example of five industry cases, we evaluate our approach and the relevance of a combined consideration of technical solution-oriented potential and strategic relevance of OI-partners. At this, stakeholder analysis does also focuses on the identification of internal OI-partners, who are necessary for developing a solution for the OI-project's task. However, they might also be relevant for reducing internal barriers such as Not-Invented-Here syndrome or resistance against change.

1. Introduction

By the use of Open Innovation (OI), companies systematically open up their innovation processes in order to collaborate with external OI-partners (Chesbrough and Bogers 2014), (Dahlander and Gann 2010). These can be suppliers, customers, users, companies from other industries or even competitors (Huizingh 2010). Besides single / selected partners, OI also supports the collaboration with crowds, which can be unspecific or partly focused, e.g. users of a particular product (Sloane 2011). This collaboration allows different advantages, such as using external expertise, increased creativity, reduced flop-rates and others (Braun 2012), (Enkel 2009).

However, the performance and success of OI directly depends on the choice of the right OI-partners (Huizingh 2010). It defines the quality and quantity of the OI-input and the long-term success of OI as well as cooperation among OI-partners and risk management strategies. Different studies revealed that a sufficient planning of OI-projects is still challenging for companies, especially the selection of suitable OI-partners and OI-collaboration methods (Enkel 2009), (Guertler et al. 2014a), (Huizingh 2010), (van de Vrande et al. 2009). The OI-planning phase defines the frame and settings of the following OI-project. Regarding mistakes are usually difficult and expensive to correct afterwards. Industry reports from the study showed that there is the risk of choosing OI-partners, who cannot contribute to a solution, or missing OI-partners, who could contribute to a solution or who are crucial from a strategic point of view. Guertler et al. (2014a) describe the case of a manufacturer of wheel-walkers. It focused on collaborating with users to improve the existing product, but neglected the fact that those were not the actual buyers of the product. These had varying demands, which were not considered sufficiently and thus negatively influenced the market performance. In summary, general problems of OI-projects are (1) focussing on technical skills and experience of OI-partners and neglecting a strategic perspective; and (2) focusing solely on external OI-partners and ignoring internal stakeholders.

To solve these and other demands, identified by Guertler et al. (2014a), we developed a methodical procedure model called "Situative Open Innovation" (SOI) (Guertler and Lindemann 2013), (Guertler et al. 2015). It supports teams from academia and industry planning OI-projects in terms of analysing situation-specific boundary conditions and selecting suitable OI-partners and OI-methods. Based on (Guertler et al. 2014f), this paper presents an integrated search methodology for identifying suitable OI-partners by combining OI-based identification approaches with stakeholder (SH) analysis. SH-analysis supports identifying and analysing current stakeholders (SHs) and their dependencies as well as assessing the strategic relevance of all potential OI-partners. A resulting SH-portfolio supports the selection of OI-partners and deriving of generic collaboration strategies.

The methodology was initially evaluated in the context of five industry projects with different OI-goals and OI-situations. The evaluation proofed the relevance of a combined strategic-technical perspective but also revealed points for further improvements.

Within this publication, the **"technical solution-oriented" perspective** summarises skills and expertise, which are necessary to solve the task and issue of an OI-project. In opposition, the **"strategic" perspective** considers the influence and interest of potential OI-partners regarding the OI-project.

2. General research design

This research is based on the Design Research Methodology (DRM) presented by Blessing and Chakrabarti (2009). It is located in the Descriptive Study (DS) by developing a methodical support to solve the demands and research gaps, which were identified in the Prescriptive Study 1 (Guertler et al. 2014a). The presented research is part of a two-years research project with three German SMEs from the field of mechanical and plant engineering ("KME – Open Innovation"). The overall goal of the research project is the development of a methodology for planning OI-projects. Within three OI-pilot-projects (within the KME project), we evaluate and enhance our methodology by applying it to different use cases, e.g. technical product improvement vs. service development. In parallel, we also evaluate parts of our methodology in additional projects with other industry partners.

To specify the goal of our research, we conducted a requirement analysis with the three KME industry partners. The main requirements were:

- R1: Usable and comprehensible also for unexperienced users of the methodology
- R2: Adaptable and scalable to different OI-situations
- R3: Lean setup: avoiding redundancies of data input and assessments
- R4: Limited effort for assessing potential OI-partners due to limited resources (time, workforce)
- R5: Applicable also with limited access to information about potential OI-partners

3. State of the Art

In the following, we present two established approaches for identifying and assessing potential project partners: Lead-User identification from the field of OI and stakeholder (SH) analysis from the field of project management. Already Gould (2012) stressed the relevance of SH analysis for OI. However, he also stated that SH analysis cannot be applied directly to OI. Thus, Guertler et al. (2013) analysed different SH analysis and Lead-User identification processes, compared them within each domain but also between the two domains. By this, dis-/advantages were analysed and the complementary character of them could be proven.

3.1 Lead-User Identification

von Hippel (2005) defines Lead-Users as users, who shows needs long before the majority of normal users do. In addition, Lead-User have the motivation and expertise to contribute to a solution for their needs. Hence, by identifying and collaborating with them, companies can gain time and competitive advantages over other companies. However, their identification is complex and involves the risk of identifying false Lead-Users.

Thus, there are different methods of Lead-User identification, such as:

- **Pyramiding**: Based on a snowball principle, potential Lead-Users are asked for further actors, who are more skilled than they are. Those are asked the same and so on. (von Hippel et al. 2006)
- **Netnography**: A community is analysed regarding current trends, problems, ideas and outstanding users (Belz and Baumbach 2010),

(Langer and Beckman 2005).

- **Broadcast search**: Based on a self-selection process, a task gets published inviting people to submit regarding solutions (Diener and Piller 2010).
- **Screening**: It is not a primary search method. Instead, an existing pool of users is analysing regarding priory defined criteria (von Hippel et al. 2006).

In general, Lead-User identification focuses an skills and expertise of potential partners, and identifies experts, who can contribute a solution to a specific task (Guertler et al. 2013).

3.2 Stakeholder (SH) Analysis

Stakeholders (SH) represents all individuals and groups, who have an interest, affect or get affected by a specific company, project or product (Freeman 2010), (Bryson 2004), (Lewis et al. 2007), (Mitchell et al. 1997), (Varvasovszky and Brugha 2000). SH-analysis focuses on their identification and analysis as well as their dependencies. It is a central part in different product development approaches, such as requirement analysis and systems engineering.

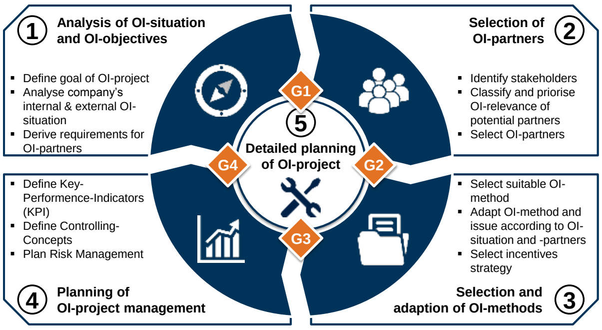
There are different methods for identifying SH, such as graphical mindmaps (Freeman 2010, p. 6), (nine) search directions (De Vries et al. 2003), search dimensions (internal, external, inter-firm network) and selection criteria (functional, geographical location, knowledge/abilities) (Ballejos and Montagna 2008).

In general, SH-analysis focuses on power and importance of potential partners, and identifies partners who can give advice or strategic support to a project (Guertler et al. 2013).

4. Situative Open Innovation (SOI)

Based on the identified needs ((Guertler et al. 2014a) in consistency with (Enkel 2009), (Huizingh 2010), (van de Vrande et al. 2009), we developed a methodology for systematically planning OI-projects (Guertler and Lindemann 2013), (Guertler et al. 2015). Its name “Situative Open Innovation” (SOI) stresses the importance of considering the company- and project-specific boundary conditions of each OI-project. Figure 1 illustrates the setup of SOI. The outer ring of SOI 1 to 4 represents the rough planning of the OI-project, which gets detailed in the central phase SOI 5. In the beginning, SOI 1 analyses the OI-situations (internal and external context factors) and the specific task of the OI-project. Based on this, SOI 2 identifies and assesses OI-partners, while SOI 3 derives suitable OI-methods. SOI 4 contains the planning of the project management, controlling and risk management. Within the detailed planning in SOI 5, e.g. the start and end of OI-methods are defined as well as the acquisition of OI-partners.

Though SOI looks relatively linear, it supports and requires iterations, as indicated by the arrows. Iterations can e.g. be caused by changing context factors, updated planning data or when matching OI-partners and OI-methods. To ensure purposeful iterations, G1 to G4 represent adapted Stage-Gates (Cooper 2001), which allow measuring and controlling the planning progress.



Source: (Guertler et al. 2015)

Figure 1. Situative Open Innovation (SOI) for planning OI-projects

5. Identification and selection of OI-partners

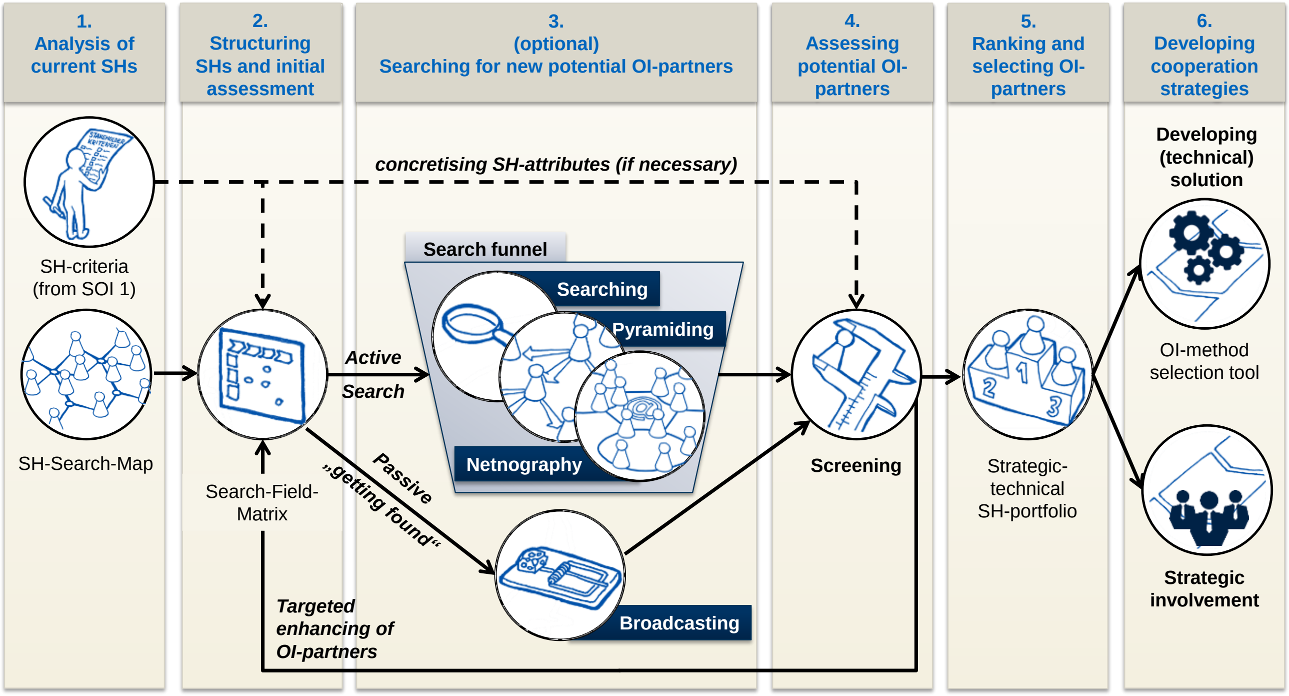
In the following, the phase of SOI 2 is explained in more detail. As depicted in Figure 2, it contains six sub-steps. It is based on the approach presented in (Guertler et al. 2015) but was slightly adapted based on the feedback from the subsequently presented industry evaluation. Depending on the specific OI-project, steps can be skipped or shortened.

In the following, we use the term **stakeholder** (SH) for all interest groups, individuals and partners who are already known to the company. In parallel, they represent **potential OI-partners**, whose pool can be enhanced by new, unknown groups and individuals. Out of them, the final **OI-partners** are selected, who are actually involved in the OI-project.

5.1 Problem analysis (part of SOI 1)

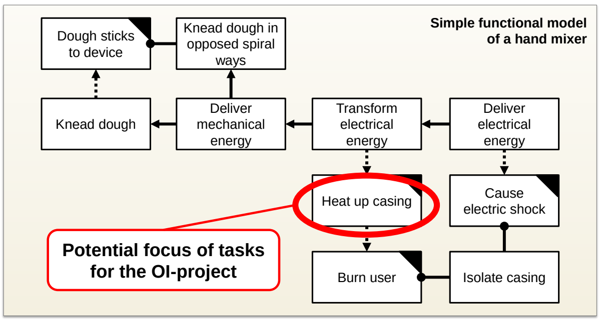
The basis for the systematic identification of OI-partners is the analysis of the OI-goal and a more detailed problem analysis. This concretises the project’s issue and derives specific tasks for the OI-partners. Depending on the OI-issue, the intensity of the analysis can vary. For instance, for technical product-related issues a component and function analysis from TRIZ can be useful (Altshuller et al. 1997), (Lindemann 2009). Figure 3 illustrates an exemplary function model of a hand mixer. The function analysis allows the deriving of useful functions, which shall be improved (e.g. increasing “creating heat”), and harmful functions, which shall be avoided or reduced within the OI-project (e.g. reducing “heating up the casing”).

Based on this, “technical” solution-oriented SH-criteria are defined, which potential OI-partners need to fulfil to able to contribute to a solution.



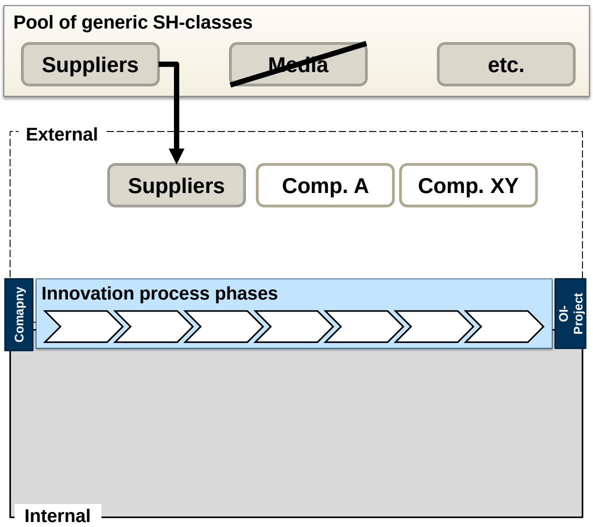
Source: enhanced version of (Guertler et al. 2015)

Figure 2. Integrated methodology of identifying and selecting OI-partners



Source: based on: (Lindemann 2009)

Figure 3. Simple functional model of a hand mixer



Source: (Guertler et al. 2014f)

Figure 4. SH-Analysis-Map with generic SH-classes

5.2 Analysis of current SH

In the beginning, a SH-analysis identifies and analyses all relevant SH of the company and the OI-project. To provide guidance and support an industrial application, we combined several search strategies from SH-analysis to a SH-Analysis-Map (Guertler et al. 2014f). As depicted in Figure 4, it contains three areas: external SH, internal SH and a simplified innovation process. After defining company-specific relevant process phases, companies can systematically identify internal and external SH for each phase. As additional support a pool of frequent SH-classes from literature is provided, e.g. from (Freeman 2010). Companies can decide whether to concretise relevant or to delete irrelevant SH-classes as well as adding new ones. Subsequently, dependencies between SHs and SHs as well as SH and process phases are analysed. A software-tool implementation, using Soley Modeller, is depicted in Figure 7.

5.3 Structuring SHs and initial assessment

This step defines project-specific search fields from a technical solution-oriented perspective of developing a solution. They help to structure identified SHs and serve as an initial assessment if the pool of potential OI-partners is large enough. Otherwise, they indicate potential fields for searching for new OI-partners.

The regarding tool is the Search-Field-Matrix, as shown in Figure 5. It is based on a Domain Mapping Matrix (DMM) (Danilovic and Browning 2007). The x-dimension are the innovation process phases from the SH-Analysis-Map. The y-dimension are the solution-oriented SH-criteria from the problem analysis in

SOI 1. The Search-Field-Matrix gives an overview, (1) which potential OI-partner is suitable for which task, (2) in which fields, a sufficient number of SHs are known, and (3) in which fields, no or only a few SHs are known. These “white” fields can indicate potential fields for further targeted searches, which can then easily delegated to different persons.

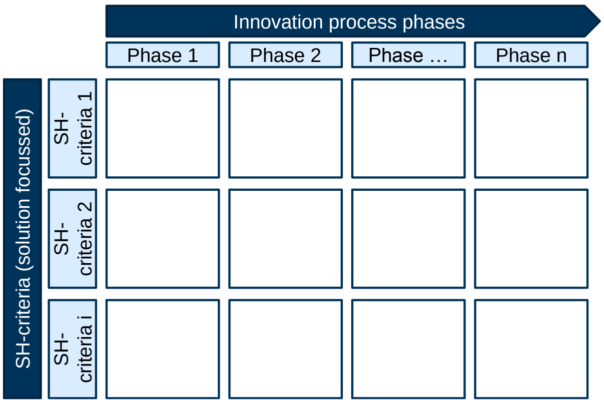


Figure 5. Search-Field-Matrix

5.4 Searching for new potential OI-partners

Based on the specific OI-goal and the initial assessment of the pool of potential OI-partners, the responsible OI-team in the company can decide, whether to skip this step or to search for new potential OI-partners within the priory defined search fields.

The OI-team can choose between two basic search strategies: (a) an active search by the company, and (b) a passive, self-selection-based “getting-found” by OI-partners. Each strategy itself contains different search methods.

5.5 Assessing potential OI-partners

This step assesses the potential OI-partners from a strategic and a solution-oriented perspective. For the strategic assessment, SH-criteria from SH literature are used (power/influence, interest and attitude) (Elias et al. 2002), (Mitchell et al. 1997). The solution-oriented assessment uses the SH-criteria from the problem analysis – in some cases, a concretisation of SH-criteria can be necessary. We recommend an assessment of strategic SH-criteria for all SH / potential OI-partners to reduce the risk of missing relevant ones. However, to reduce the assessment effort, the solution-oriented SH-criteria are classified as KO-criteria, performance criteria and “nice-to-have” criteria (based on the basic idea of KANO (Lindemann 2009)). Only if the KO-criteria are fulfilled, potential OI-partners are assessed in more detail by performance criteria. “Nice-to-have” criteria support the following decision between two similar ranked OI-partners.

5.6 Ranking and selecting OI-partners

To allow a systematic selection of OI-partners, a Strategic-technical SH-portfolio is used for ranking potential OI-partners. Based on the strategic SH-criteria, the strategic relevance (y-axis), and based on the solution-oriented SH-criteria, the solution-oriented potential of each OI-partner (x-axis) is derived, as depicted in Figure 8 (Guertler 2014). At this, “**solution-oriented**” or “**technical**” indicate an OI-partner’s capabilities to contribute to a solution of the OI-goal. In addition, dependencies between SHs are modelled, based on the SH-Analysis-Map. The position of each potential OI-partner and links to other SHs in the portfolio indicate their suitability to the OI-project.

5.7 Developing cooperation strategies

In parallel, the Strategic-technical SH-portfolio supports the derivation of generic cooperation strategies, based on strategies from SH-analysis (Guertler 2014). SHs with a high strategic relevance but low technical potential should be involved in a strategic way, e.g. by informing or for acquiring other OI-partners. OI-partners with a high solution potential should be involved into the development of a solution of the OI-goal. To derive regarding, suitable OI-methods, we developed a spreadsheet-based OI-method selection tool.

6. Industrial Evaluation

In the following, we present the results of five industrial evaluation projects. In this publication, we set the focus on comparing different application contexts of our methodology. Due to space reasons, detailed descriptions of each industry case are presented in separate (future) publications ((Guertler 2014), (Guertler et al. 2014f), (Guertler et al. 2015)).

5.1 Looking for multiple new OI-partners

Our first industry partner was a manufacturer and supplier of mechanical connection elements for B2B customers. The product itself had no direct contact to end users, which limited the possibilities of the OI-partner search. Another limitation was the high competitive intensity in the market, which required a high degree of concealment. The goal of the OI-project was the development of a new material and regarding industrial production process (radical innovation), and the identification of experienced OI-partners for a regarding R&D cooperation.

Since none of the known SHs had regarding experience, the OI-partner search had a broad scope aiming at identifying as many new potential OI-partners as possible. The SH-analysis supported the reflection, discussion and documentation of existing

SHs and their dependencies. This revealed potentially risky dependencies between e.g. suppliers and competitors and served as a starting point for the subsequent search. By the use of the Search-Field-Matrix, promising search fields could be identified as well as SHs, who could be utilized as support. For instance, universities and trade fairs served as a basis for Pyramiding searches.

Due to the broad search, a multitude of potential OI-partners was identified (ca. 180). To keep the assessment effort manageable, a pre-assessment with KO-criteria was crucial. This reduced the number to ca. 55 potential OI-partners, which were then discussed internally by the industry partner. They derived their TOP5 potential OI-partners, who are contacted to gain information for a detailed assessment. Due to the high need of concealment, the industry partner could not directly contact the OI-partners. Thus, we established the first contact as a kind of intermediary. A SH-portfolio was not created since almost none of the interesting potential OI-partners had any link to the industry partner or SH.

Figure 6 illustrated the ca. 180 identified and pre-assessed potential OI-partners, who were clustered regarding their geographical location and their type. This supported a structured discussion in the company.

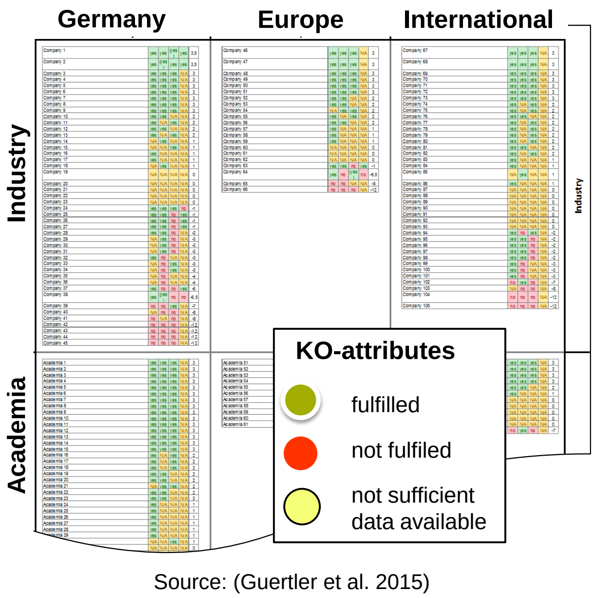


Figure 6. Potential OI-actors, after KO-criteria assessment

5.2 Solving a technical OI-goal

The second industry partner was a manufacturer of facility equipment, which was bought by B2B customers but used by B2B and B2C users. The OI-goal was the improvement (incremental innovation) of a mechanical component. The regarding technical problem has been known for years, but no solution approach had been successful so far. Thus, the problem should be solved with new, hitherto unknown OI-partners.

The SH-Analysis-Map supported the identification of known SHs and existing R&D cooperations. Due to the complexity of the technical problem, a problem analysis was conducted to derive a Search-Field-Matrix. The problem analysis used a component model and a functional model, as illustrated in Figure 3. By this, relevant components and functions could be identified and regarding tasks and SH-criteria derived. An occurring challenge was a suitable definition of the SH-criteria. On one hand, they should be unspecific enough to allow a broad search. On the other hand, they should be specific enough to allow a sufficient assessment of identified potential OI-partners. To allow both, the SH-criteria were differentiated in criteria for the search (Search-Field-Matrix) and criteria for the assessment. The assessment SH-criteria were categorised into KO-, performance- and nice-to-have-criteria. An additional weighting of criteria was not done. Since our industry partner focused on new, unknown OI-partners, we also had strategic KO-criteria (e.g. “unknown to company”).

5.3 Solving a service-oriented OI-goal

The third industry partner was a manufacturer and service provider for production plants. The OI-goal was the development of new services. The newness of potential OI-partners was not in the focus. Figure 7 depicts the resulting SH-Analysis-Map and derived Search-Field-Matrix. In contrary to industry case 2, no complex problem analysis was necessary. The SH-criteria addressed aspects of: who would benefit by the new services, who had experience in that field, who would/could set relevant regulations, etc. In this case, also some strategic KO-criteria were defined, such as “not linked to competitors”. At this, the SH-Analysis-Map supported to identify and document regarding links.

Since the industry partner was not primarily interested in finding new OI-partners but in an expeditious OI-partner selection, the Search-Field-Matrix was enhanced to its current (parallel) role as initial assessment of the need for a further OI-partner search. By the initial assessment of all SHs regarding the SH-criteria and mapping them to the regarding search fields, the industry partner could deduce that there was no current need for a further search. By this, a lean methodology application was supported.

In parallel, in this case the SH-criteria were defined in such a way that they could be used for deriving roles of OI-partners (based on (Ballejos and Montagna 2008)), such as: future user of the services, regulator of the services, etc. Those can later also be used to delegate different tasks to OI-partners.

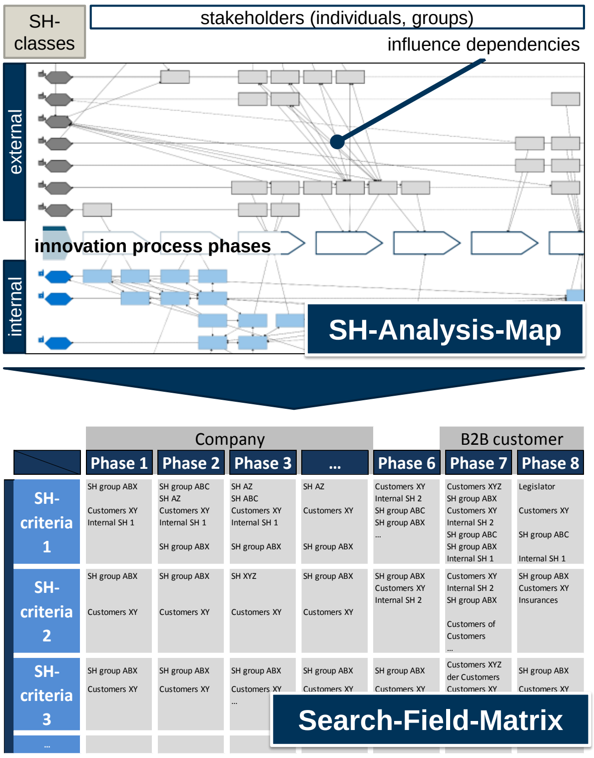
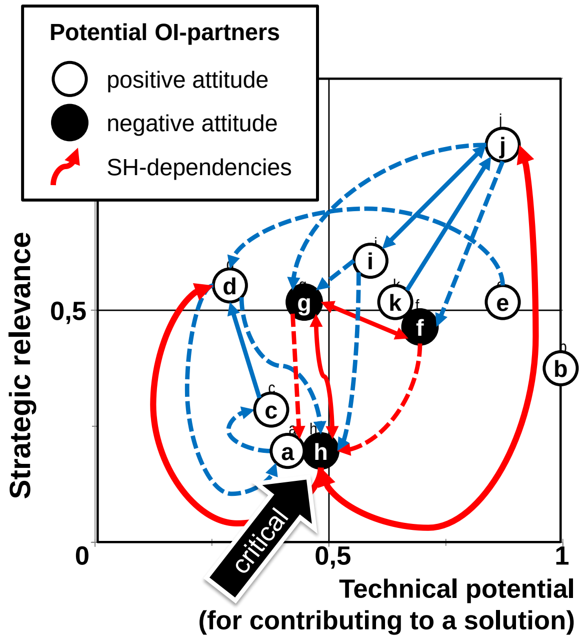


Figure 7. SH-Analysis-Map and Search-Field-Matrix



Source: (Guertler 2014)

Figure 8. Strategic-Technical SH-portfolio

5.4 Identifying negative SH-dependencies

The fourth industry partner was a vehicle manufacturer, which wanted to introduce a new product development sub-process within the company. In contrary to the other cases, this case is an example of "internal OI" between different departments and business units. The SH-analysis identified more than 150 SHs, who were pre-assessed and condensed. Figure 8 shows the SH-portfolio for a subset of 11 SHs / potential OI-partners. Based on the SH-portfolio generic cooperation strategies can be derived (Guertler 2014):

- **Upper right sector**: involvement for development of solution of OI-goal (primary)
- **Lower right sector**: involvement for development of solution of OI-goal (targeted enhancement, e.g. cross-industry partners)
- **Upper left sector**: strategic involvement
- **Lower left sector**: potentially negligible

Thus, e.g. SH "j" were a preferred OI-partner, while "a", "c" and "h" could have been neglected. However, by modelling the dependencies between SHs, a strong dependency between SH "j" and "h" could be identified. Since "h" had a strong negative attitude towards the OI-project and OI-goal, this was a potential risk when involving "j". SH "j" could have used its influence to negatively affect SH "j". Our industry partner had to decide whether to choose another OI-partner, influence the link between "h" and "j", or also involve "h" in a sufficient way.

5.5 Utilizing positive SH-dependencies

The fifth industry partner was a service provider from the transportation sector. The OI-goal was to survey B2B customer regarding their needs and wishes to develop new services. Though the target group of OI-partners was quite focused, an external and internal SH-analysis was conducted. This SH-analysis evinced to be valuable in different ways:

In the context of the internal SH-analysis, maintenance workers were identified, who complained about incorrectly filled damage reports from the customers. This stressed the need for the development of an app-based damage reporting, which was also derived from the customers' wished. In addition, the workers were valuable OI-partners for developing a solution. They ensured that all necessary fields and answering options were included into the app to allow a direct usage by the maintenance department.

Another demand from the customer survey was an electronic order processing. Thus, the old fax machine should be replaced by a new multifunction printer. However, the responsible head of maintenance opposed it because he was used to the old device and did not trust the new one. By the internal SH-analysis, a positive dependency between the head of maintenance and a friendly IT-admin could be identified. The IT-admin could easily be convinced of the new device's benefits. Afterwards, he himself convinced his friend. Hereby, the new device could be installed in a conflict-free way, which ensured a sustainable success and utilization. The involvement of the IT-admin is an example of a strategic involvement of OI-partners.

6. Overall discussion and limitations

Though the evaluation showed the general applicability and benefits of the OI-partner search methodology, it also revealed points for further improvements.

The definition of SH-criteria turned out to be challenging: for the actual search, they should not be too narrow to avoid missing potentially interesting partners. However, for the assessment, they should be not too broad to allow a precise assessment. The differentiation of two different (but content-wise similar) sets of SH-criteria was successful in the second industry case and also is in line with the idea of an initial assessment by the Search-Field-Matrix. Still, it needs to be evaluated if it is applicable for all cases.

The categorisation of SH-criteria as KO-, performance- and nice-to-have-criteria in combination with a stepwise assessment proofed to be valuable for an industrial application. It reduced the regarding effort since only the reduced, pre-filtered set of potential OI-partners was assessed in detail. However, our industry partners stated difficulties in defining sufficient KO-criteria. The development of regarding methodical support needs to be addressed in future research.

In some cases, industry partners needed to be convinced of conducting the structured methodology. They actually would have preferred to start directly by involving well-known partners. The methodology was considered as additional effort and delay, and was primarily applied to satisfy academia. Despite the positive results in the end, providing sufficient incentives for using the methodology is crucial for its industrial application and long-term success.

At this, the adaptable and scalable character of the methodology proofed to be beneficial. By enhancing the Search-Field-Matrix as an initial assessment of potential OI-partners, it allows an overview of the need of a further partner search and regarding search fields. It is also possible to combine different steps of the methodology, e.g. to reduce the number of workshops. Therefore, within SOI 1 the OI-situations analysis, the problem analysis and the definition of SH-criteria can be combined; the SH-analysis, and definition and analysis of search fields; as well as the SH-assessment, ranking and selection.

Due to the current state of the methodology, different parts of the methodology are realised in different software tools. This complicated the usability and was criticised by some industry partners. It needs to be solved in the following research.

In general, the feedback from the evaluation was quite positive. Besides the “hard” results from the methods and tool, also “soft” aspects were stated as benefits: e.g. by discussing SHs within the SH-analysis, a homogenous level of knowledge within the OI-team was ensured. This is especially important when new employees or employees from different departments work together.

A main limitation was also that only the planning phase of the OI-project was evaluated. The evaluation of the OI-partner selection in the OI-project conduction phase is missing so far.

7. Conclusions

The choice of OI-partners is crucial for the success of an OI-project. It influences the quality and quantity of the gained OI-input from the OI-project as well as the collaboration between company and OI-partners and among different OI-partners. However, studies showed that selecting suitable OI-partners is still challenging for companies. Often OI-partners do not sufficiently contribute to the OI-project, or relevant OI-partners are neglected, which might risk the project’s success. Regarding methodical support is limited so far.

Thus, this publication presents a methodology for systematically identifying, assessing and selecting relevant OI-partners. It combines elements from Lead-User identification and stakeholder (SH) analysis. This publication especially focuses on evaluating the benefits of the SH-analysis in different application contexts. The methodology consists of six steps: beginning with analysing existing SHs and their dependencies, then analysing the need of searching for further potential OI-partners, including different search strategies, efficiently assessing and ranking potential OI-partners, and selecting relevant OI-partners as well as deriving generic cooperation strategies. For the selection of OI-partners, dependencies between SHs are crucial. As the industry cases showed, these dependencies can whether be negative and a potential project’s risk or positive and a support for accomplishing the OI-project.

The contribution to academia and industry is a methodology, which supports a systematic identification and selection of OI-partners. This reduces the risk of missing important OI-partners or choosing unsuitable ones. Single methods and tool within the methodology can also be used independently and adapted to other use cases. For instance, the SH-Analysis-Map can supports a structured identification of SHs for any kind of project as well as the Search-Field-Matrix. This matrix clusters potential OI-partners regarding different task areas of the OI-project. This serves as an initial assessment and reveals fields for necessary further searches of OI-partners. The single field can then be delegated to different members of the OI-team, who plans the OI-project. The explicit instructions of the methodology’s steps support especially users with no or only low experience. The discussions within the steps also ensure a homogenous level of knowledge within the OI-team. The adaptable and scalable character of the methodology allows the adaption to different application contexts.

In the short-term, we will develop a consistent software tool for all steps of the methodology, using Soley Modeller. This will allow a consistent use of insert data and avoid manual transfers from one tool to another. Though the actual search was not in the focus of this publication, we will enhance the current search strategies by elements from further approaches, such as supplier search or OI-intermediary selection. Since our methodology was mainly evaluated in the planning phase of the industry projects, the next research step is the observation of the following conduction phase of the OI-projects. This will show if the assumption and decision from the planning phase also work in the application phase or if the methodology needs to be enhanced accordingly.

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