

# Lead User in Open Organizations

## How a Refined Lead User Concept can help to Integrate Workshop Results

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### Abstract

*Having tried to apply the classical Lead User methodology to various cases, companies have called for changes. In the case of a large automotive supplier in Germany the management wanted to fill the innovation funnel with ideas created in a Lead User workshop. First discussions showed very soon that the general framework of the company does not allow for a classical Lead User workshop. The general framework of the department 'pre-development Human Machine Interface' in the company was analyzed and the classical Lead User methodology was adapted. The new concept was shorter, as we reduced the time to one day only, and additional participants, like start-up companies as well as the technical-solution-know-how of the company itself were integrated. After the workshop the results were analyzed and the reliability of the new workshop concept was evaluated and compared to the outcome of other Open Innovation methods. The general framework of that particular automotive supplier is very similar to many others in that industry, so the new workshop concept might be a solution to many other companies.*

### 1. Introduction

When talking to companies within the group of the German car supplier industry, almost all understand the benefits of Open Innovation (OI). Many have carried out various OI projects within the last 10 years, but very few will apply the measures taken again. In an interview study performed among budget managers at the beginning of 2016, 85% stated that the money

spent on OI projects within the product development process, does not lead to products of higher usability or better customer centricity. The open innovation information (OII) expensively collected does not show in the products at the end of the product development process.

One of the main reasons is the difficulty in integrating external knowledge, the open innovation information (OII), into the product development process.

When talking to the same managers about opening processes, we found that 76% are in favor of transforming their companies into a more open organization with larger possibilities of collaboration with other partners within and outside the company. The reason they give is mainly the demographical shift, which already makes it hard to find young highly educated and especially motivated employees. The integration of external knowledge, the reactivation of retired engineers and a stronger and more open collaboration within the companies with other departments are a first attempt to cope with this challenge. Hence, Open Organization is the consequent step of Open Innovation.

This development of opening up companies helps to attenuate the dilemma explained above. Companies, which are critical to OI projects, are opening up for different reasons, such as the demographic shift and as a result the opening process makes it possible to integrate the OII more successfully and helps the OI projects to succeed at last.

In this paper we will discuss the case of a German Automotive supplier, ZF Friedrichshafen AG. The

company already has experiences in OI Projects such as cross-industry projects but is still looking for new concepts to improve their OI activities and handle the difficulties that come along with these projects.

In order to find new ideas and boost the innovation process, the company came up with the idea of using an ideation workshop to generate those ideas, which are based on market needs. A classical Lead User workshop, where ideas are generated outside the company and then handed over in a leather bound book is regarded negatively by the management, as success rates of other companies, which have done the same, are considered low. But integrating external success directly into the company is seen as a much better idea. Bringing together internal engineers with solution knowledge – best from different business units –, external participants with market needs and startups having external solution knowledge is the concept the management supports, as it is based on the idea of Open Organization in the development process. The company will not only try to integrate external knowledge generated in an external workshop, but develop ideas and solutions together in an open environment.

By bringing together internal and external participants, the company is transforming the development process from a closed to an open organization. As a starting point we have taken the classical Lead User concept and have refined some of the aspects. This paper explains the development of the altered method, the identification of the participants for the workshop, the workshop itself and finally compares the results we obtained with the results of a classical Lead User workshop.

## 2. Current understanding of the classical Lead User Method

Lead Users by definition are “a special group of customers that experience needs unknown to the public, which they address by creatively using their technical expertise” [1], [2]. By putting the Lead-User-Method into practice this special group of customers can be identified and integrated within a Lead User workshop into the fuzzy front end of the innovation

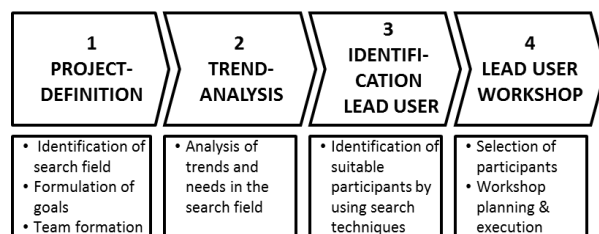


Figure 1, the process of the classical LU method, [11]

process of a company [3]. Hereby the classical Lead User method by Eric von Hippel follows the steps visualized in figure 1.

In phase 1, the project starts with the definition of the search field, the formulation of the goals and the formation of the team, which best consists of members from different departments. A KPI (key performance indicator) to easily integrate the results into the company afterwards is that, one or more representatives of the internal customer, e.g. an engineer of the R&D department, within the business unit, which will sell the newly developed product/service in the end, should be part of the team.

In phase 2 the trends and customer needs within the search field will be evaluated. Best are phone interviews with real customers or personal interviews at trade shows.

In phase 3 Lead Users are identified by using different identification methodologies.

Their specific knowledge about needs, the know-how and competence to meet their individual needs as well as their motivation enables Lead Users to develop radical instead of incremental innovations [4]. That is why Lead Users have important information which are helpful input factors for companies in the innovation process in order to create value [4]. The integration of Lead Users gives room for solutions to new products or services so that companies are enabled to innovative growth [3].

The classical Lead User workshop will generate new ideas for products which are characterized by changing customers’ needs and trends in the search field. The company will develop novel and radical innovation ideas in order to improve their innovativeness. Furthermore they will integrate these ideas into future specifications for new products for the automotive industry [5].

On one side the classical Lead User method helps to generate and evaluate ideas. On the other side it develops and proves concepts with customers [6]. If the change in the needs of the users within the search field is significantly high, the Lead User method can be applied in B2B as well as in B2C markets. [6], [7], [8]. By integration of Lead Users companies have the possibility of exchanging external know-how as well as cooperating with external partners [3], [9]. The creative potential of Lead Users is supported within a classical Lead User workshop by using group dynamic effects [3]. Therefore the goal is to identify the needs of Lead Users and develop them into solutions. In doing so, companies can reduce both “flop-rates” of future products and their “time-to-market” because they are

able to actively support a need oriented, more cost-effective and faster development of new products [3].

### 3. Adaptation of the classical Lead User method

The strategic goal the company's management set seemed to be reachable by applying the Lead User method. But looking at peers and the success rate of Lead User workshops and specially the difficulties in integrating the results the company's management questioned, even so having large experience in Open Innovation activities, if the classical method would bring the required results. Additionally, the company's management demanded an organizational framework for the workshop, which made changes to the classical method inevitable.

The company demands a reduction of the workshop-time from generally 2-3 days to just 1 day. Furthermore, following the concept of Open Organization, the company wants to use internal and external participants, although the classical Lead User method defines Lead Users as external persons - a special group of customers. As in many workshops the company asked the participants to agree and sign the company's participation conditions in advance of the Lead User workshop. No direct competitors of the specific business unit were allowed and due to budget limitations only participants from Germany were invited.

In the following chapter we will explain the methodology we applied in order to adapt the classical Lead User method to cope with the companies demands and use the chances of an Open Organization in the product development process.

### 3.1 Research design

Looking at the 4 phases of a Lead User project (figure 2) the special framework of the company influences only phases 3 and 4. Therefore we will only focus on those phases in the following.

#### Research question

*What does the modified Lead User method has to look like in order to cope with the company's framework, with its restrictions and the chances of an Open Organization product development process?*

In order to develop, implement and prove the modification of the classical Lead-User-Method the following steps were applied:

1. Analysis of the companies framework
2. Definition of need for change
3. Development of the modified method

## 3.2 Adaptation of the Lead User Method

### 3.2.1 Analysis of the framework of the company

The framework of the company can be identified by analyzing the project assignment and by interviewing the company's management involved in the OI project. Collecting information in the following clusters

- Organizational aspects
- Thematic aspects
- Expectation of the company

and describing the characteristics of the criteria – shown in figure 2 – gives an overview of the specific framework of the company. By comparing the company's characteristics with the characteristics of a classical Lead User workshop the need for change can be defined.

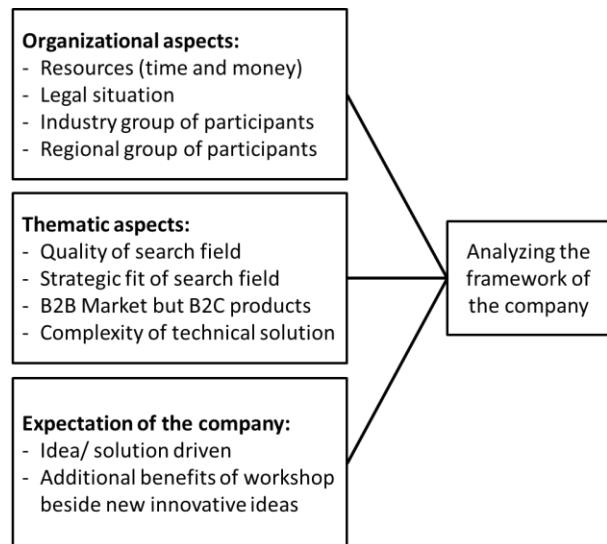


Figure 2, the criteria to define the change to the classical Lead User method

### 3.2.2 Definition of need for change

By analyzing the company's framework and comparing it with the framework of a classical Lead User framework the aspects for change were identified. Figure 3 shows the characteristics of the criteria.

In order to design a modified Lead User method, the following principles were extracted from the characteristics. As the search field is very focused and narrow the possibilities to find a sufficient amount of Lead Users on the market, from which a sample to participate in the workshop would be chosen, the **role between solution provider and need provider is divided into two individuals and one group of solution providers was recruited from internal engineers.** As all participants had to sign a very strict

NDA weeks before the workshop only to be considered to be part of the workshop, **a very vigorous legal agreement was implemented.**

The workshop agenda had to be adjusted massively, as in one day only 100 new ideas within the search field had to be produced. **From need definition to the development of the solutions with designers, all had to fit in one day only.**

The company is part of the automotive industry with very integrated value chains. Developing a product within the defined search field it is possible, that the company will become a competitor of its recent customers. Having understood, it is not possible to invite any direct or indirect customers to the workshop. In order to integrate a sufficient amount of market knowledge a group of startup companies was identified, which had a brilliant overview at the market of the specific search field and also had enormous solution know-how. **Instead of using direct or indirect customers as a source of Lead User a specific group of startup companies were used instead.**

	Classical LU Method	Framework of the company
Identification of Lead Users	Sufficient resources allocated in order to identify participants also in small and complex markets	Very limited resources (budget and project team) All participants only from Germany/Austria/Switzerland
	LU are external participants	Integration of internal engineers as solution providers
Execution of Lead User workshop	Rather liberal agreement just before or after Lead User workshop	Strict agreement on IP before participants are considered to be part of workshop
	Workshop 2 to 3 days	Workshop takes place on one day only
	Customers (direct and indirect) very often best source for identification of Lead Users	Customers not allowed in the workshop as the company moves into new business field and recent customers might become future competitors

Figure 3, the characteristics of the criteria for a classical Lead User and for the modified Lead User workshop

### 3.3.3 Development of the modified method

Due to the need of change the following method was developed. As visualized in figure 4, the modified method consists of six phases.

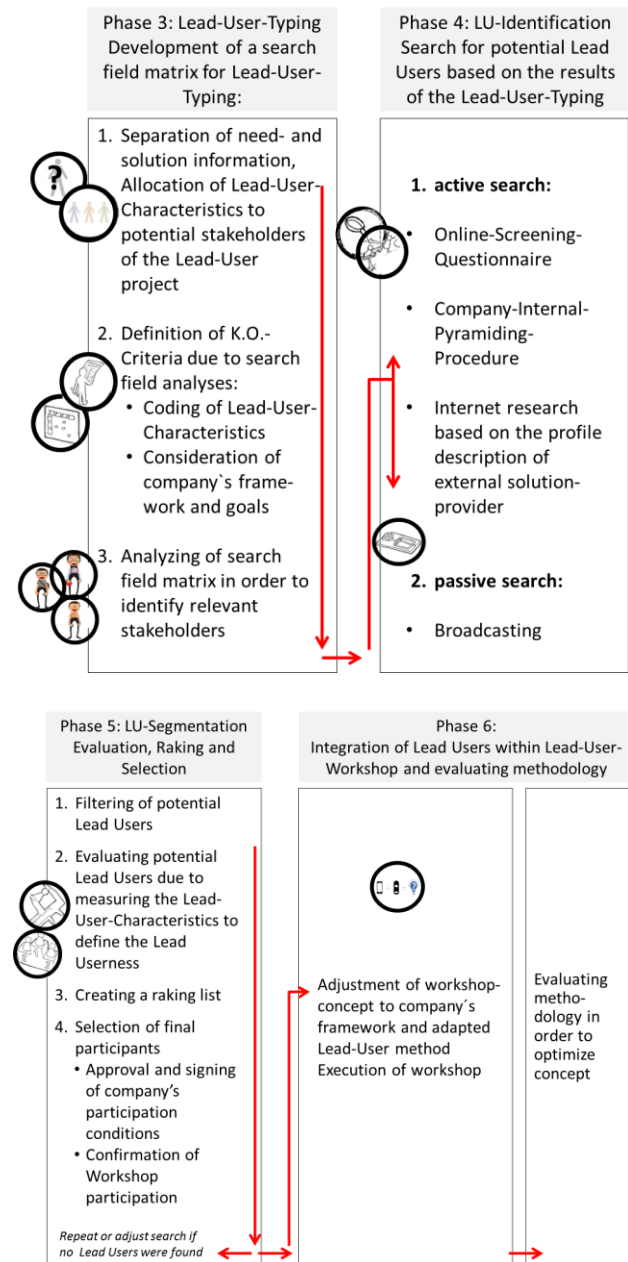


Figure 4, overview of the adapted Lead User method [12]

Phase 1 and 2 are the same phases as the ones of the classical Lead-User-Method. Looking at phases three to six the need of change is very high.

The first adaptations have to be made in phase 3 – the Lead User typing. This can be achieved within three steps:

1. The knowledge on market needs and knowledge on solutions will be separated into two different groups of stakeholders. The specific Lead User characteristics will be allocated to the different groups.
2. By analyzing the search fields it is possible to define the specific Lead User criteria.
3. By adding all information to a search field matrix in order to analyze which group of stakeholder has the relevant information about needs or solutions and also fits to the company's framework, it is possible to create a Lead User search profile.

The results of phase 3 provided the foundation for phase 4 – the identification of participants. Within this phase a pool of potential participants was identified by the classical Lead User search methods.

The next phase – phase 4 – comprised the segmentation of the potential participants in order to identify the final Lead User. The segmentation was carried out in two steps:

1. Identification of potential Lead Users from the pool of potential participants by rating them
2. Creation of a ranking list in order to select and invite the final participants

Phase 5 comprised the adaptation of the workshop concept in order to meet the expectations of the company's framework – e.g. the reduced workshop time. The adaptations of the time frame is shown in figure 5.

Phase 0	Phase 1		Phase 2
<b>Invitation and assignment</b>	<b>Part 1: Get together and instructions</b>	<b>Part 2: Get together and instructions</b>	<b>Introduction</b>
Informing participants Collection of needs of participants within the search field	Introduction of participants Information on workshop agenda Evening event	Background knowledge on company, technology and Lead User method	Need assessment: Clustering of needs Building of sub-problem-cluster
3-4 weeks in advance	3 hrs.	0,5 hrs.	1 hrs.

Phase 3	Phase 4
<b>Development of solution ideas within small groups</b>	<b>Presentation of results</b>
<ul style="list-style-type: none"> <li>• Working on sub-problem-clusters within small groups</li> <li>• Moderator, designer and evaluators</li> <li>• Development of idea profiles</li> <li>• Processing time, 90 minutes in each group</li> <li>• Each team rotates after 90 minutes in order to work on another sub-problem-cluster</li> </ul>	<ul style="list-style-type: none"> <li>• Presentation of idea profiles to plenum</li> <li>• Evaluation of idea profiles</li> <li>• Feedback round</li> </ul>
In-between lunch break	
4,5 hrs.	1 hrs.

Figure 5, adapted time frame of the modified Lead User method

#### 4. Development of an evaluation methodology

In order so evaluate the altered Lead User method, the results of the workshop (quality of ideas and performance of participants) are compared to results of classical LU workshops and other OI methods. To do so an evaluation methodology has to be developed.

##### Quality of the ideas:

To evaluate the ideas the company's idea quick check methodology, which is used in the innovation management process and here especially in the first phase of the stage gate process is used.

In a first step the ideas are evaluated according to their creativity level. In a second step, the best ideas passing this gate are evaluated according to their technical feasibility. Here feasibility is defined by the question: What is the ratio between expected acceptance and needed effort to implement the idea?

In order to evaluate the creativity of the results the following criteria need to be considered [10]:

- **Novelty:** How novel is the idea? How different is the idea from existing patterns of thoughts?
- **Usefulness:** Would you recommend the problem solving idea to your best friend?
- **Appropriation:** How clear and understandable is the description of the idea?

The goal of the evaluation process is to keep the decision making process as simple as possible and to prevent long discussions.

**Quality of participants:**

In order to evaluate the participants the following criteria were developed.

- Attendance rate
- Observed Lead Userness and soft skills during the workshop

Attendance rate:

First of all the attendance rate was measured. This verification allows conclusions about the willingness to participate and this informs about the motivation of the participants [8]. The rate can be calculated as followed:

$$\text{Attendance rate} = \frac{\text{Participants invited coming to workshop}}{\text{Participants invited not coming to workshop}}$$

At this Lead User workshop all the invited participants were present, which leads to the assumption that their motivation to participate was as high as the motivation of the participants of a classical Lead User workshop.

Observed Lead Userness and soft-skills during the workshop:

Using a checklist and a feedback discussion with 3 observers during and after the workshop the Lead Userness of the participants was estimated. The checklist is visualized in figure 6.

**5. Execution of modified Lead User method**

As explained above we will focus on phases 3 and 4 of the Lead User study in this chapter.

In phase 3 the Lead User profiles were defined and by using various identification methods participants were obtained.

The need-providers were found by applying a screening questionnaire via the company’s social media platforms. Beside this a broadcast call was made in order to gather more need-information. The internal solution-provider was identified with the help of the classical pyramiding procedure within the company. The last group, the external solution-provider – the start-up-companies – were acquired by a structured Internet research based on the descriptions of their profiles. After applying the identification methods, the pool of potential participants was ranked and segmented in phase 5 by determining the Lead Userness. Based on this, the final group of participants was selected and invited, provided they had agreed and

signed the NDA in advance of the workshop. In phase 6 the workshop-concept was adapted to the modified Lead User method and the limited time frame. The single phases will be described in the following.

The first part of the introduction phase (phase 1 figure 5) was moved to the evening of the day before the workshop day. Therefore a suitable program was selected including a get together in order to generate an intimate and creative atmosphere among the participants. This program helped to improve the possibility for personal exchange and networking [11]. Furthermore, information on the workshop agenda was provided.

<p><b>Evaluation scale Lead Userness</b>          1 = does not apply at all to very weak          2 = does rather not apply to weak          3 = rather correct to strong          4 = fully correct to very strong</p>	
Motivation	The participant listens to others and asks for the opinion of others
Involvement	The participant has an interest in the search field.
Innovativeness	The participant is able to search for new solutions to satisfy his needs in the search field.
Dissatisfaction	The participant expresses his dissatisfaction with the use of the products in the search field.
User experience	The participant uses very often products of the search field and has comprehensive, application-specific knowledge.
Object knowledge	The participant has knowledge on technical solutions within the search field.
Object knowledge in analog markets	The participant has novel / innovative solution information in the search field.
Opinion leadership	The participant gives advices or information to interested persons by informal and product-related exchange of views.

Figure 6, Check list to evaluate in workshop observable Lead Userness, [3], [8]

The second part of the introduction phase took place on the workshop day itself (phase 2 figure 5). It included a presentation comprising the main facts of the search field, such as recent challenges and trends but also information of the scientific background as well as the rules during the workshop. Then the identification of

market needs and problems within the search field was performed by applying creativity methods. Creativity methods help to accelerate the flow of ideas, to circumvent intellectual blockades, to enlarge the search direction and to specify the problem formulation [11]. The results of the applied creative methods were clustered around the different sub-problems in the search field.

In the next phase smaller groups worked on the clustered sub-problems (phase 3 figure 5). Each start-up company covered one sub-problem focusing on their solutions or businesses within the search field. The amount of start-up-companies, in this workshop three, defined the amount of separate workspaces. The remaining participants, consisting of need-providers and internal solution-providers, were distributed to those three smaller groups. Each small group cooperated with a start-up company on one of the sub-problems by using various creativity techniques and developed ideas for solutions. At least three of the developed ideas were visualized by participating graphic-designers and documented in detail on an idea fact sheet. After a processing time of 90 minutes, the small groups changed the workspace and developed solution ideas and idea fact sheets for another sub-problem in the search field in collaboration with another start-up-company. This phase was finished after all three small groups had worked on each sub-problem.

In the final phase (phases 4 figure 5) all idea fact sheets were presented to the plenum. After that the evaluation of the ideas took place by putting “idea dollars” to three of the ideas which each participant rated the most creative ideas. Finally an idea ranking was obtained by counting the “idea dollars” put to each idea. The workshop ended with an open feedback round and by answering the evaluation questionnaire.

## 6. Evaluation of Workshop results

It was possible to identify 13 participants with the modified Lead User method and within the executed workshop 40 ideas were visualized.

In order to evaluate the modified Lead User Method, the quality of the participants and the quality of the ideas were estimated.

### Quality of obtained ideas:

As mentioned above, in order to estimate the quality of the ideas, the company’s internal quick test for ideas was used. The quick test checks the level of creativity and the technical feasibility. After applying the quick test 17 ideas were identified as highly creative. In the next step these 17 ideas were rated by using their technical feasibility, which led to the top three ideas which were analyzed further in the company’s stage

gate process. Compared to internal brain storming methods the top 3 ideas, derived from the modified Lead User workshop, scored in the upper 30%.

	Motivation	Involvement	Innovativeness	Dissatisfaction	Use experience	Object knowledge	Object knowledge in analog markets	Opinion leadership	Total score
Start-up 1	3	3	3	3	3	3	3	3	4
Start-up 2	4	4	4	4	3	4	4	4	4
Start-up 3	4	4	4	4	2	3	4	3	4
Solution-Provider 1	2	2	3	2	2	3	2	1	2
Solution-Provider 2	3	2	3	2	4	3	3	2	3
Solution-Provider 3	3	3	3	3	4	3	3	3	3
Solution-Provider 4	3	3	3	2	3	2	2	2	2
Solution-Provider 5	4	3	4	3	3	4	3	4	4
Need-Provider 1	3	2	3	2	3	3	3	3	2
Need-Provider 2	3	3	3	2	3	4	3	3	3
Need-Provider 3	4	3	2	3	2	2	2	3	2
Need-Provider 4	3	3	2	3	3	2	2	2	2
Need-Provider 5	3	1	2	3	2	1	1	1	1

Figure 7, evaluation of Lead Userness during and after the workshop

### Quality of participants:

As explained above, the quality of the participants was evaluated using the following criteria.

- Attendance rate
- Observed Lead Userness and soft skills during the workshop

As all invited participants came to the workshop the first criterion was met entirely. The second criterion used, was the observed Lead Userness of the participants during the workshop. The evaluation of all participants was done by 3 observers during the workshop and in a joint discussion afterwards. The observers estimated each participant using eight criteria by putting a number between 1 - very weak and 4 – very strong to each criterion. The results are shown in figure 7.

Some weeks before the Lead User Workshop, in a test workshop with random students, the students scored mostly 1, very rarely better than 2. In the Lead User workshop the largest group of participants scored 3. The distribution of the Lead Userness is shown in figure 8.

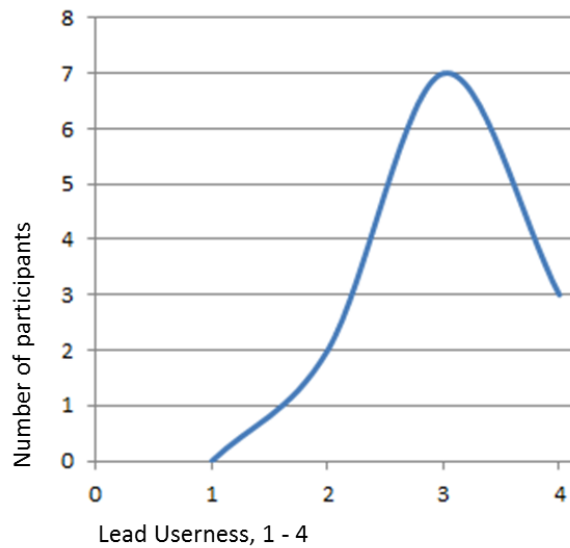


Figure 8, distribution of Lead Userness among participants

## 7. Discussion and Validation of the modified Lead User method

Differences to the classical Lead User method are mainly the separation of the information – needs and solutions – as well as the integration of start-up-companies and internal experts of the company. One advantage is that need-provider have to have knowledge on current needs only, they do not have to have a combination in the topic of needs and solutions, which makes it much easier to identify those participants. Furthermore, innovative start-up-companies provide external market knowledge and knowledge on novel technologies and solutions in the particular search field. This knowledge can be expanded by adding the internal knowledge of the company’s experts. Within the classical Lead User method the protection of the company’s intellectual properties is difficult because the relevant information is often found with costumers or competitors. This goes especially for Lead User workshops in the B2B area, where it is extremely difficult to find know-how outside the supplier – customer value chain. The modified Lead User method rather uses employees, students, housewives or pensioners, who possess the defined degree of need-knowledge and motivation to participate in the workshop as need-provider with very little knowledge on solutions. To cope with that problem, the integration of the start-up-companies guarantees the right amount of solution information within the workshops. Questions on intellectual property can be negotiated directly with the CEO of the start-up-company, which are much easier to handle

compared to the IP departments of larger companies. One reason is the very high motivation of the start-ups to participate in the workshops in order to get access to potential bigger customers or R&D partner. Comparing the modified Lead User method with other open innovation methods reveals the advantages and disadvantages. An overview is provided in figure 9.

	Bilateral idea WS	Innovation journey	Cross industry WS	LU WS (B2B)	External idea contest	Adapted LU method
Number of total parties involved	2	≥ 3	≥ 3	≥ 10	≤ 100	≥ 10
Total number of participants	5 - 10	5 - 10	8 - 15	10 - 25	≤ 100	10 - 15
Time from internal kick off to idea generation	1 - 4 m	4 - 10 m	2 - 6 m	3 - 8 m	3 - 6 m	3 - 6 m
Budget (internal und external)	+	+	++	+++	++	++
Complexity of legal issues	§	§	§§§	§§	§§	§
Number of ideas been generated	+	+	+	++	+++	+
Incremental or disruptive	I	D	D	I, D	I, D	I, D
Chances of short term new business/ sales	++	0	+	++	+	+

Figure 9, the adapted Lead User method compared to other OI methods

Main differences to the classical Lead User method are the reduced complexity of legal issues of the altered method and the lower budget, as it is much easier to find suitable participants. A negative aspect of the modified method is the reduced amount of ideas generated, as the workshop is limited to one day only. Despite the successful implementation of the modified method scope for improvement could be deducted. Major weak points of the modified Lead User method are the following:

- Lead-User-Identification: Is the questionnaire used complete and does it evaluate all aspects of the Lead Userness of the participants?
- Lead-User-Workshop: Start-up-companies took over the moderation within the small groups during the ideation phase. Thereby they neglected their role as solution-provider for developing a common solution idea for the company.
- Lead-User-Workshop: The observed Lead Userness was influenced by the soft-skills of the participants and environmental influences during the workshop.



- Results of Lead-User-Workshop: Despite the integration of the start-up-companies the resulting ideas of the workshop are mainly incremental optimization of existing solutions, instead of disruptive new business cases, which would have been favored by the company.

By optimizing these weak points the workshop concept could reach a point, where it will be useful to execute for many other companies in a similar B2B environment. The concept is based on market needs, provides innovative ideas and solutions, which are estimated within the company well above the average ideas. Additionally, the concept was able to cope with the difficult conditions found at the company. Furthermore, the workshop was a starting point for future cooperation between the company and some of the participating start-up-companies in form of joined business or research and development projects. In conclusion, the classical Lead User method has been extended to an interactive value adding process between the company and the Lead Users, which facilitates the access to Open Innovation Information (OII) and enlarges the network of potential partners for the company. Furthermore, using the trend to an Open Organization (OI) in the R&D departments, the integration of internal resources in the Lead User workshop makes it much easier to integrate the OII into the innovation process of the company afterwards.

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