

Integrating diverse users in sustainability innovation processes

Innovation workshops seen from diverse perspectives

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1. Integrating diversity issues in innovation processes

People differ in many ways, and therefore their needs and requirements on a product as well. Open innovation processes promise companies an extension of the innovation potential beyond the bounds of the enterprise. Integrating diverse people as consumers, and at the same time as inventors and developers into the innovation process, enables an improved positioning of the products on the market. In contrast, users may have reservations about the provision and external use of their own ideas without getting much out of it themselves. Target-group specific addressing has to go further than acquiring appropriate customers and has to keep the specific wishes and motivations of differing users in mind. In the research project "NaNu! – user integration in sustainability innovation processes", Gender Studies in Science and Engineering at Technische Universität München examines diversity related issues of methods of user integration in sustainability innovation processes. To customize the products to the diverse needs and desires of different user groups, diversity related factors are integrated into the research project. The participants from twelve innovation workshops, which were conducted with enterprises in 2008 and 2009, have been interrogated. The aim was to find out how they felt during the workshop and afterwards. Based on the findings, the goal is to develop a planning tool for the design of gender and diversity sensitive methods for the user integration in those innovation processes, and to develop methodologies for user integration further – including the selection of users and the appropriate design of each measure – so that gender and diversity issues are considered explicitly and sustainable. The challenge is to achieve a win-win situation, both for companies and users. In our contribution we would like to present the research project and findings from the interrogation of the workshop participants. Further we would like to discuss the diversity perspective of the methodology of user integration in innovation processes.

2. Diversity and Open Innovation

Diversity (management) as a strategic approach is visible in many processes and structures. First, organizations undertake great efforts to contribute to the well-being of their diverse employees. Enterprises react on the fact that the employees are characterized by different cultures of origin, generations and sexes, and establish structures in which people are able to work without prejudices (cf. Ihsen 2005). Second, diversity becomes a keyword in process of product development, costumer orientation and costumer innovation. Different realities of men and women and differences between cultures, ages, lifestyles and life stages have a relevant impact on the development of products and their implementation and enforcement on the market. Diversity addresses the fact that people differ in many ways and therefore their needs and demands both in sustainable products and marketing services. To integrate and activate them as consumer leaders, and at the same time as the inventors and developers into innovation processes, promises improved placements of products on the market and leads to a greater acceptance and gratification of consumers. The consideration of these aspects therefore provides an extension of the research questions and the expansion of the scope of the innovation development through user integration. Action-guiding knowledge is closely interwoven with the life situation of individuals. This has to be considered and purposely implemented in its manifestations (gender, age, professional background, job situation) in the methods of user integration.

Open Innovation describes the involvement of customers in the innovation process with the aim of not situating developing processes within the corporate boundaries but to use potential for innovation outside the company. "Customers become active participants in the innovation process" (Reichwald / Piller 2005, p. 1, translated by the authors). User integration means the targeted inclusion of potential customers in innovation processes, from the initial concept as far as launching und distribution. Thus, companies hope to increase

market acceptance through early integration of the application contexts and user's needs, a reduced risk to flop and faster diffusion in the market (cf. Reichwald / Piller 2005).

The question of *which* customers have to be included in the innovation process is mostly based on the type of process. Is there, for example, a customer segment that has not yet been reached by a certain offer, it could be a good thing to acquire people from this customer segment in order to find out the reasons.

The methods of user integration vary according to the level of integration in the development process and by the degree of interaction between the users which will be dealt with in detail in the following.

3. Integrating diverse customers through innovation workshops – The research project

"NaNu!"

The aim of the joint project "NaNu!" is the enhancements of the theory of user integration in innovation processes. The intention is to gain knowledge on the successful involvement of users in innovation processes and to develop concrete recommendations. The following questions should be answered: At what point should users be involved? What kind of user? How should they be involved? These recommendations are then incorporated into the successful development and commercialization of sustainable products and services and contribute achieving sustainable consumption (see www.nanu-projekt.de). Analogous to the objective of the entire joint project, the goal of this sub project is mainly about the further development of the theory of user integration in innovation processes with particular attention to gender and diversity specific factors. Therefore the methods are reviewed in terms of gender and diversity related factors within the innovation process. Within the three product areas and beyond, there are various approaches for gender-and diversity related research questions which address the possibilities and limits of the integration of different user groups with particular attention to gender, age and professional background. The practical aim is to bring in relevant gender and diversity aspects into all kinds of sustainability innovation processes. The question is, which methodical approaches – including the selection of users and the design of the individual measures – are suitable to enable effective and efficient identification and implementation of customer- or user requirements or how the three methods can be further developed to explicitly and sustainably include gender and diversity considerations (taking into account gender, age and cultural background, specific life situation and individual needs). With it, different aspects of the innovation process are considered. Also, the question will be pursued which role is played by the different and similar approaches of the users in the development of sustainable products. The goal is to

develop a planning tool for the design of gender- and diversity equitable methods for user integration. Therefore gender-specific criteria are generated for each experimental situation. The so-developed planning help is to make the results transferable to other innovation processes.

3.1. Innovation workshops

At the centre of consideration are innovation workshops that were conducted in cooperation with several companies from November 2008 until September 2009. The idea was to group people, who differ by gender, age and professional background in order to bring different needs, wishes and perspectives together. Innovation workshops as methods of user integration are characterized by a high degree of integration and interaction. The method is highly integrative as it is usually initiated by the company itself and conducted in high agreement with the company. Furthermore the participants of the workshop usually have the possibility to get to know the company with its entrepreneurial goals and its products. The interactive part is produced by the cooperative form of work, in which the participants are working together on the task during the workshop. A successful cooperation depends considerably on the social structure of the group. The ability to communicate and the social competence of the group members are of great importance for the work process and the attainment of the workshop's goal. The knowledge of the individual group members can only be utilized if there is the basis of a good cooperation and communication.

Diversity in this case means that groups have shared and diverse attributes in regard to their composition, i.e. concerning sex, family background, age, personal attitude, life situation, experience, background, field of study (Rastetter 2006). Surveys describe a benefit from diversity (management) on team level in regard to higher productivity and enhanced

cooperation (Stuber 2003). In particular the following arguments for a heterogenic composed group are mentioned (Cox/Blake 1991):

- Creativity argument: the variety of the group members leads to enhanced creativity because of the resulting variety of perspectives.
- Problem solving argument: decisions which are reached based on manifold perspectives are better and more sustainable.
- Flexibility argument: A heterogeneously composed group shows a higher willingness and ability to adapt to changed environmental conditions.

According to the company's objective the task can vary in its concreteness. If a development process is at its beginning, the customers are asked to develop initial ideas. If a product is already on the market it will be mostly about designing and marketing issues.

3.2. Design of the survey

As part of the research project "NaNu!" twelve innovation workshops in the categories of needs: housing, mobility and nutrition were held in collaboration with the industry. Each of the three categories of need was represented by two companies. There were two workshops per company, thus, per each category of need four workshops were held. The task of each workshop was formulated in consultation with the companies, but the focus in all the workshops was placed on the development of new creative ideas. The users worked together on innovative concepts. The courses of the workshops proceeded always in the same way but were composed differently concerning the members of the workshop. The specialty about the project is the fact that two similar workshops were conducted with each company, but one of them with so called "lead users" and one with – as one can say – "non-lead users" or "ordinary users" (cf. Belz/Ramakrishnan 2010). Lead users are users, who are especially involved in the specific issue. They have a deep interest in actively developing a

new product and usually have a lot of know-how (cf. von Hippel 2005, Arnold 2010, Arnold/Gebauer/Ihsen 2010). Lead users are ahead of the ordinary users, as they recognize the specific needs of a product earlier (Belz/Ramakrishnan 2010). In this survey the lead users have been identified by a screening questionnaire. Those who had a high “lead userness score” (Belz/Ramakrishnan 2010, p. 3) were invited to the lead user workshop, the participants of the non-lead user workshop had a low lead userness score. The lead userness score measures attributes of users like their satisfaction with a product, their involvement, their knowledge about a product and how to use it (cf. Belz/Ramakrishnan 2010).

The workshops lasted one and a half days. During the workshop different methods were used: Informative blocks about product and business cooperation, sustainability and diffusion with subsequent discussions in plenary alternated with creative group and individual work phases. After the group work phases, the results of the groups were presented in plenary and discussed. The participants of the workshops received €100 allowance, catering at the workshop and repay of travel costs (cf. Arnold/Gebauer/Ihsen 2010). Each workshop was attended by 9-16 people.

Four workshops took place in the field of housing, each with two companies that offers passive house solutions. Thus, both companies came from the ecological building and living. Moreover, the products are already on the market and situated in a market niche. The task set in the workshop was to develop sustainable, innovative housing concepts as well as to integrate aspects of marketing. The participants of the lead user workshop, which was organized by the company "81fünf", were composed of architects, experts of timber construction and experts on passive houses. Of the 13 participants that attended the workshop were twelve male and one female. Except for one person, all participants had a higher education with university diploma. The average age mounted up to 41.7 with an age range of 33-48 years. The workshop of the non-lead user consisted of participants with

different professional background. Of the 13 participants, nine had a university degree, three had a matriculation standard and one was a master scholar. The participants were composed of seven men and six women, age ranged 21-60 years and the average age was 41.1. Nine persons attended to the lead user workshop of the company "Gundlach", and of that the majority (six) worked in the sectors of construction / architecture. The other participants worked in other fields. Five persons had a university degree, including two graduate engineers; the other four stated the matriculation standard as highest educational attainment. Among the participants were five male and four female. The average age was 29.5 years and the age ranged 23-38 years. In the non-lead user workshop ten people came together, thereof two men and eight women. Inasmuch as the majority of the participants consisted of students, the most frequent highest education was the matriculation standard. Two persons had already a university degree. The professional background and degree program varied respectively. The age ranged 22-30 years and the average age was 25.8 years.

In the area of bioplastics four workshops took place as well, in which two companies were represented, who produce food and search for sustainable packaging concepts for their products. Task for the participants of the workshop was to find innovative and ecological packaging, as well as to adapt the design and handling to customer demands. At the lead user workshop of the company "Andechser" participated 16 people, of which seven were male and nine were female. The majority of participants were students, four of them were studying food technology or related subjects. The remaining participants came from different disciplines. The highest level of education of seven persons was the matriculation standard, five participants had a university degree. The age ranged 20-70 years, and except for the 70-year-old person, all participants were 20-29 years old; the average age was 27.06 years. The non-lead user workshop of the company Andechser was visited by 14 people, men and women were represented in equal numbers. The workshop was attended by many students

from eight different disciplines. The remaining participants had different professional backgrounds. Highest level of education among the eight students was the matriculation standard. In addition, there were three people with university degrees, two with General Certificate of Secondary Education, and one person represented with a CSE. The participants were on average 30.86 years old and had an age range 20-68 years, whereupon the majority of the participants were in their early twenties.

In the lead user workshop of the Company "Bernbacher" participated 15 people, six of them were male and nine of them were female. Nine participants had a food technologic and nutrition scientific background, five of them were studying such a degree program, and the other six participants were from other different industries. Eight persons named as the highest educational achievement a graduate degree, five persons had reached the matriculation standard and one had a doctorate and each had a General Certificate of Secondary Education (GCSE). The age ranged 22-54 years and the average age was 29.23 years.

The non-lead user workshop of the company Bernbacher was attended by 15 people, including four males and eleven females. The participants came from diverse disciplines and industries, most of them were students (8). The most frequent reported highest level of education was the matriculation standard, in addition there was one person with a diploma and another person, who strives for doctorate. The participants were on average 27.96 years old and had an age range of 20-42 years. For the category of needs of mobility, four workshops took place as well, accompanied by the companies "RMV" and "MVV" (local public transport companies in the Rhine-Main-region (RMV) and in Munich (MVV)). For these companies of the local public transport particularly, concepts should be developed, which should bring together an innovative, new way mobile advancement and latest information technology . The RMV had an additional requirement: They should even

develop concepts with and for the target group 55 +, as well as to take the additional theme of "wellness and well-being" into account, and to contribute this. On the lead user workshop of the Rhine-Main-network participated 16 people, including nine male and seven female participants. The selection was based on the frequented use of the RMV's and less on their career-technical knowledge. Many participants came from public service or from teaching. The age ranged 57-72 years and the average age was 61.9 years.

The non-lead user workshop was attended by 17 people, six of them were male and eleven of them were female. The participants had different professional backgrounds and were heterogeneous in the very details of their qualifications. The average age here was 65.1 and the age ranged 58-73 years.

In the lead user workshop of the MVV participated 14 people, all of them were male. The professional background differed greatly, and extended across all sectors. Half of the participants stated as the highest level of education a university degree, two people had graduated, two people gave the GCSE as their highest educational degree and one person the matriculation standard. The participants showed an age range 26-64 years and an average age of 44.8 years. The non-lead user workshop was attended by ten people, including eight men and two women. Here, too, varied the professional background strongly. Seven of the ten participating workers had a university degree, and one person had a matriculation, another person had the GCSE and the examination for the master craftsman's certificate as the highest level of education. The average age was 47.2 years and the age ranged 30-68 years.

To survey the socio-demographic data of the participants a questionnaire was developed. This set included information about sex, age, professional background, industry affiliation and the highest level of education. Furthermore the questionnaire comprised several items to query the attitudes according the composition of the workshop. In detail the respondents answered questions about how they estimate the composition of the workshops

concerning the age, sex and professional background of the participants. Furthermore they assessed the effects of this composition (regarding age, sex and professional background) on the results of the workshop. In the questionnaire they were also asked about their own performance e.g. how they coped with the heterogenic composition of the workshop, if they had to adjust their way of work because of this composition, and finally if they could pursue their own ideas.

The participants filled out the questionnaire immediately after the workshop. In total 157 questionnaires were filled out, 14 questionnaires had to be sorted out because of formal errors. Table one shows the sample of the valid sets.

Categories of needs	Lead user/ Non-lead user	Total number	Female	Male
		143	67	76
Housing	Total	41	19	22
81fünf	LU	9	0	9
	NLU	13	7	6
Gundlach	LU	9	4	5
	NLU	10	8	2
Total	LU	18	4	14
	NLU	23	15	8
Nutrition	Total	51	32	19
Andechser	LU	12	8	4
	NLU	14	7	7
Bernbacher	LU	15	9	6
	NLU	10	8	2
Total	LU	27	17	10
	NLU	24	15	9
Mobility	Total	51	16	35
MVV	LU	10	2	8
	NLU	12	0	12
RMV	LU	14	5	9
	NLU	15	9	6
Total	LU	24	7	17
	NLU	27	9	18

Table 1: Overview sample

In the following we would like to present some findings of this questionnaire which was also the basis of our further study, where we interrogated some participants after the workshops in focused interviews.

4. Diverse Perspectives

The following discussion focuses on the diversity dimensions age, gender, professional background and the fact if they are “leading” users or not. The latter gives in this survey information about the fact if a person comes with expertise or professional knowledge. In consideration throughout all categories of needs and workshops one can see some tendencies.

Two workshops had a clear target group orientation on the generation 55plus. The average age was about 63.5 at both workshops on a range of ages from 57 -73. Despite of the relative homogeneity of age, the age distribution from the participant in these workshops was classified as heterogeneous. The subjective perception of the age distribution is different from the objective, that means depending on the view of participants a by scientists as a homogeneous composed group can be judged by the group to be very heterogeneous. The participants obviously did not have the feeling that people of younger age were missing, from their perspective there were both younger and older people attending.

Comparing the workshops relating to their composition of gender, one can state that up to a gender ratio of 1:2, the composition of the gender referred to as heterogeneous. This was visible in the statements of the participant across all workshops, even when the number of one gender was twice the number of the other gender. There seems to be a critical point of three persons per workshop. In one workshop, only men were present. This affected - according to the participants - not detrimental to the task. However, a negative influence was given at that workshop with only one woman present.

Concerning the heterogeneity of gender, it is to say that older people found the heterogeneity of gender more important for the results of the workshop than younger people. Men estimated both the heterogeneity of gender and age by trend more obstructive for the results of the workshop than women. Whereas women did not see any barriers in

heterogeneity of age or gender for getting good results, men, especially in the twenties and thirties, weren't sure about this fact. It was the heterogeneity of age which was estimated more obstructive than the heterogeneity of gender.

The interrogated lead users estimate the expertise of the participants in their workshop more diverse than the non-lead users in their workshops. Since the lead users had especially in the categories of need nutrition and housing a very similar background, one can draw different conclusions. Because of their own expertise, it could be that they perceive more differences and variations than people who have no specific knowledge about the relating subjects. It could also be that they are more interested in the expertise of the other participants because they deal with the same subjects.

The same results can be seen when comparing workshops with participants of similar professional background, regardless of whether they were lead users or not. Perhaps it can be assumed that upon discovery of a similar professional background of the other participants there are more discussions on the job, which seems highly differentiated for experts in the industry. Another significant difference between lead users and non-lead users seem to confirm this conclusion: The lead users in the overwhelming majority rated the statement "due to the different composition of the participants an original and innovative idea for the tasks could be found" as completely correct in contrast to the non-lead users.

5. When does diversity management start?

When it comes to the implementation of innovation workshops collaborative cooperation plays an essential role. In contrast to “idea competitions” or other individual methods of user integration, workshops are exposed by series of disturbances because of the high degree of interaction between the participants. The specialty of these workshop designs and what makes them so different from most of the other methods is that participants have to work together on a concept. Furthermore they get directly feedback to their ideas from the other participants. This is where the plentiful resources of perspectives, opinions and individual knowledge are appreciated and diversity aspects play a crucial role.

The presented data shed light on the fact that diversity starts very early and thus diversity management as well. According to the initial aim, achieving a win-win-situation both for the company and participants, diversity management means to cope with the diverse perspectives, needs and wishes.

The experiences of our workshops suggest the conclusion that participants with appropriate know how and high involvement in the subject (like the lead users have been) attach great importance to the particular background of each other. Lead users seem to need more space to exchange experiences than ordinary users.

Concerning the composition of gender, the data confirm further studies that claim one gender should not build the absolute minority. The experience from the workshops shows that being for example one woman in a group of men can draw the attention of this one person and may affect the group work. However a homogenous group of one gender worked well in this survey– at least regarding the group climate. In this case one could put in question if a homogenous group will bring enough variety of perspectives to achieve good results.

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