

# Co-Creation in New Product Development: Conceptual Framework and Application in the Automotive Industry

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**“Open Innovation” refers to an opening of the innovation process towards users’ and other stakeholders’ knowledge, creativity and skills. While open innovation initiatives can take a variety of forms, such as Crowdsourcing, Co-Creation Toolkits or Netnography, the question how open innovation efforts can be permanently anchored within a company is yet hardly addressed. This paper provides a conceptual framework how companies can implement co-creation activities in a permanent and sustainable way. We claim that a holistic approach of collaborative innovation requires not only a skill set of tools and methods but also adapted innovation processes, organizational routines and cultures. The introduced programmatic approach implies the need to think of co-creation as a strategic programme rather than as a “just in time” outsourcing of innovation tasks. A co-creation programme is characterized by continuous collaborative relationships with users, consisting of various internal and external cycles of acquiring and assimilating the users’ value contributions. To illustrate the applicability and benefits of such a programmatic approach, the example of the BMW Group Co-Creation Lab is outlined and discussed.**

## 1. Introduction

Companies with superior R&D units have traditionally been technology-driven innovation leaders. Since the turn of the millennium, however, many of these companies have undergone a radical change in innovation strategy by opening up their innovation processes to external stakeholders (Chesbrough 2003; von Hippel 2005). Henry Chesbrough who introduced the term “Open Innovation” defines it as “a paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as the firms look to advance their technology.” (Chesbrough 2003). Meanwhile open innovation is a powerful movement in the business world and in academic research alike (Enkel

et al. 2009; Gassmann et al. 2010;) touching a whole family of related concepts such as user innovation (von Hippel 1988; 2005; Thomke and von Hippel 2003), collaborative innovation (Sawhney et al. 2005), crowdsourcing (Howe 2006), mass customization (Piller 2003; Pine 1993), wkinomics (Tapscott and Williams 2006), virtual customer integration (Dahan and Hauser 2002) or co-creation. The latter was introduced first by Prahalad and Ramaswamy in their Harvard Business Review article, “Co-Opting Customer Competence” (Pralhalad and Ramaswamy 2000) followed by detailed books “The Future of Competition” (Pralhalad and Ramaswamy 2004) and “The new age of innovation“ (Pralhalad and Krishnan 2008). All concepts have at least in common that they go beyond organizational boundaries

and foster the collaborative exchange and integration of resources and know-how outside the company into the value chain. While the open innovation paradigm emphasizes the role of business models and IP rights as devices to capitalize on internal R&D spillovers as well as on external knowledge, the co-creation research stream emphasizes the importance of collaboration and co-creation with customers and end-consumers. Author and management expert Prahalad states:

"The future of competition, however, lies in an altogether new approach of value creation, based on an individual-centered co-creation of value between consumers and companies" (Prahalad and Ramaswamy 2004). This means that consumers are not only asked to contribute information according to their wants, needs and product requirements but are also invited to bring in their creativity and problem-solving skills. Users are asked to be actively involved in different tasks, e.g. to generate and evaluate new product ideas, to elaborate a detailed concept, to evaluate or challenge it, to discuss and improve optional solutions, to select or individualize the preferred virtual prototype or to test and experience new product features. (Sawhney et al. 2005; Prahalad and Ramaswamy 2004). The application of cutting-edge internet technology allows creating playgrounds and forums for collaboration, interactive content creation and strongly facilitates the dissemination of co-creation.

This paper intends firstly, to introduce a conceptual framework of how to organize and align co-creation activities for new product development (NPD) within a programmatic approach and secondly, to present the application of an ongoing co-creation programme initiated in the automobile industry.

## 2. Conceptual Framework based on a Programmatic View on Co-Creation

Programmatic approaches are known from government leadership and intervention strategies dealing with a great variety of topics such as unemployment, environment protection, integration policy, development aid and many more. The programs are characterized by a defined degree of intentional planning and central leadership. Instead of concentrating upon the particulars of an individual case, aspects are addressed as complex phenomenon where many actors bear a responsibility. The assumption is that when diverse actors join their forces, the net effect will be bigger than the sum of the individual activities. Applying the programmatic view on a concept such as co-creation from a firm's perspective enables a more holistic view of how to facilitate and foster openness to drive innovation. A prominent example of a programmatic approach in the field of open innovation is the "connect and develop" program initiated by Procter & Gamble (P&G). For P&G the motivation to change the way to develop and commercialize products were the declining innovation success rates in the beginning of this century. P&G lost more than half of its market cap when the stock slid from \$118 to \$52 a share.

It was obvious that the traditional invent-it-ourselves

model was not capable of sustaining high levels of top-line growth. The management's directive was that 50 percent of product innovation should involve significant collaboration with innovators outside the company in areas such as packaging, design, distribution, business models, trademark licensing, technology as well as new products and services. The model proved to be successful. Through "connect and develop"- along with improvements in other aspects of innovation related to product cost, design, and marketing – R&D productivity increased by nearly 60 percent. The innovation success rate more than doubled, while the cost of innovation decreased. Five years after the company's stock collapse in 2000, P&G had doubled its share price and has a portfolio of twenty-two billion-dollar brands (Sakkab, 2002; Huston and Sakkab 2006). The P&G case is still one of the rare examples of a programmatic open innovation approach integrated on a corporate level.

Based on the findings and many years of practical insights in the field of co-creation the authors propose three major perspectives to ensure a programmatic view on the concept of co-creation: (1) Methods and Tools, (2) Process, and (3) Organization and Culture (see Fig. 1).



Figure 1: Programmatic Framework of Co-Creation

### 2.1 Methods and Tools

Companies can choose from a whole landscape of methods and tools for collaborative innovation with users. Most developments and advancements of these techniques are driven by using the web as a vast library of dialogue on products and brands as well as a network to identify and connect creative minds. Furthermore web-based techniques for co-creation allow users to fulfil defined innovation tasks by themselves, i.e. letting them translate their needs directly into ideas or first concepts with the help of interactive online tools.

In order to illustrate the broad spectrum of available approaches for collaborative innovation, in the following crowdsourcing, co-creation toolkits, the lead user method and netnography are introduced as modern tools and methods for co-creation in new product development.

## **Crowdsourcing**

Crowdsourcing involves the act of taking tasks traditionally performed by companies and outsourcing it to an undefined, generally large group of people in form of an open call (Howe 2006; Kozinets et al. 2008). The concept is closely related to social software or online collaboration platforms on which companies broadcast defined problems to potential solvers in the form of an open call for solutions (Lakhani 2006; Piller and Walcher 2006). The crowd consisting of amateurs, volunteers working in their spare time, experts or small businesses which were initially unknown to the company then create possible solutions according to the problem stated. These solutions are submitted online and can be sorted and evaluated by the crowd. The invested labour of the crowd is generally compensated, either monetarily, with prizes, with recognition or with intellectual satisfaction. The Netflix Prize (Fortune, 2009), Swarovski (Forrester Best Practices in User-Generated Content, 2009) or Innocentive (Lakhani 2006) are only a small selection of a huge variety of examples and platforms driving the diffusion of the approach in the business world. Through crowdsourcing companies can tap a wider range of talent than might be present in its own organization. The users' significant investments of time, knowledge and creativity are usually incentivized by prizes as well as the exhibition of user ideas and coinciding publicity. However, the co-creation activity itself has also been found to be intrinsically rewarding (Csikszentmihalyi 2002; Dahl and Moreau 2007; Füller 2010).

## **Co-Creation Toolkits**

The aim of co-creation toolkits is to equip users with online applications which empower them to develop and transfer their creativity into solutions (Hippel and Katz 2002). Various co-creation modules such as configuration tools or drag&drop features constitute a playful experience, resulting in a high engagement of users. For example, interactive development kits allow users to compose a product concept along certain feature dimensions receiving instant feedback on their actions and decisions. Combined with research in the backend of the application users' preferences and needs can be observed and multiple attributes can be jointly measured. Online co-creation studies and labs can be either used on an individual basis, i.e. each user is integrated separately, or in a networked and collaborative structure adding a social dimension and allowing users to connect and communicate with one another. Integrated communication features such as online discussion forums allow for rich interaction on a user-to-user as well as on a user-to-company level and may be either moderated or free-flowing.

## **Lead User Method**

The lead user method has been developed by Eric von Hippel (Hippel 1986) and describes the systematic identification and collaboration with lead users in NPD. Lead users are far ahead of market trends relative to the majority of product users as they are familiar with future

conditions and virtually "live in the future" (Urban and von Hippel 1988). They experience extreme needs not met by products that are currently on the market and thus are motivated to develop innovative solutions for their problems. Additionally, further characteristics have been found to correlate with "lead userness", e.g. opinion leadership or product experience (Bilgram et al. 2008; Lüthje 2004; Schreier and Prügl 2008). Various search methods such as screening (von Hippel et al. 1999), pyramiding (von Hippel et al. 2009) and signaling (Tietz et al. 2006) have been developed to efficiently identify lead users with complementary skills and characteristics both online and offline. Lead users expect an outstanding high benefit of the satisfaction of their very specific needs respectively by solving individual problems through self-developed solutions and prototypes. Lead users frequently come from analog fields of applications rather than the actual product innovation. Altogether, Lead users are capable and motivated partners to co-develop new products and services.

## **Netnography**

Netnography is the linguistic blend of "internet" and "ethnography" introduced by the marketing professor Robert Kozinets in 1998 (Kozinets, 1998, 2002, 2006). Evolved from ethnographic research, the core idea of Netnography is to gain unbiased, unobtrusive consumer insights through observing the conversation and social interaction of community members in an empathic way without intrusion and exertion of influence. There is little doubt that the Internet has changed the way consumers communicate. An increasing number of users actively gather together online and communicate in web forums, blogs and various kinds of user generated content platforms. They exchange personal experiences and opinions about products and its usage and talk about opportunities for solving product-related problems. Some of them even develop product modifications and innovations, which they post online and share with other community members. This turns online communities into distinctive consumer tribes where highly involved consumers exchange existing needs, ideas, attitudes and perceptions towards products and brands (Kozinets 1998, 2002, 2006). They represent a powerful source of innovation (Füller et al. 2006). As a methodological guideline for Netnography Bartl et al. introduced a systematic five step approach which helps to identify relevant online sources, analyze and interpret user statements and transfer consumer insights into initial product solutions (Bartl et al., 2009).

The different co-creation methods can be characterized by different degrees of openness. Whereas crowdsourcing is characterized by a high level of openness as the accessibility for users is generally unrestricted, i.e. via a web portal open to the public, netnography represents an observational and therefore by nature a moderate approach of consumer integration. From an operational perspective successful co-creation projects call for hard skills, especially methodological and tool-related competencies, as well as soft skills such as in-depth

experience in the social media landscape, the sourcing of suited co-creators and in managing and maintaining communities of co-creators. However the proficient realization of single co-creation projects is not a warranty for the overall success of co-creation. The right methods and tools have to be selected and combined depending on the phase of NPD and the specific innovation goals which brings us to processes as second dimension of a programmatic co-creation view.

## 2.2 Process

One of the core questions of co-creation is at what stage in the NPD process the involvement of users should take place. An idealized innovation process represents how products move from opportunities and ideas, to concepts, to design & engineering, to testing and launch (Dahan and Hauser 2002). The question when to involve users is directly linked to the actual purpose of the co-creation task like e.g. generating ideas, evaluating and refining concepts, specify product features or creating prototypes. Whereas the integration of customers in the latter stages such as test and launch is common practice especially in market research, more and more modern techniques of co-creation and open innovation focus on the fuzzy front end of innovation as well as on the design and development itself. E.g. Netnography allows identifying new opportunities to innovate, crowdsourcing platforms allow to unleash the creativity of the masses and toolkits such as user design enable thousands of users to create their preferred future products using virtual prototypes. The challenge for the innovating company is to assign development tasks which are congruent to the customers' skill level meaning that the participant is challenged, but not more than she/he can manage. Originally emerging in marketing services literature and quality management literature various customer roles in service delivery and quality management were identified (Lengnick-Hall, 1996). These roles mostly differ in their terminology and context, not in the attempt to offer a structured analysis of the phenomenon of customer involvement in value creation.

Within the field of NPD the authors distinguish three customer roles which are closely related to the necessary customer skills, attributes and characteristics to fulfill the transferred development task: (1) customers as source of ideas (2) customers as lead users and innovators, and (3) customers as end users and representative buyers. These roles support a better understanding of Co-Creation. Nevertheless, it is important to keep in mind that the transition from user to innovator as well as from consumer to a virtual development team member is often fluent and strongly depends on the internet-based methods used. Brining in the process view on co-creation shows quite plainly that excellence in single co-creation projects is not a warranty for the overall success from a programmatic point of view. Particularly in the case of long-term development projects aiming at the generation of breakthrough innovations it is necessary to select and orchestrate single co-creation projects conducive to the

overall innovation goals. A co-creation process consists of alternating outbound and inbound exchanges of information to connect internal innovation activities and the input of users. By that means internal technological know-how can be merged with external knowledge and creativity. At one stage of the co-creation process, for example, it may be necessary to define a narrow solution space for users in order to meet certain technological or strategic requirements. On the contrary, at another stage the solution space may be left open to gain ideas off the well-known paths. Also, the input of users needs to be interpreted and, occasionally, slightly adapted or enriched before it is played back at the users for repeated evaluation and enhancement in a following co-creation project. These sequences of inbound flows of creativity and knowledge from users and outbound flows of information from inside the company may be considered a co-creative 'ping-pong game' (see Fig. 2).

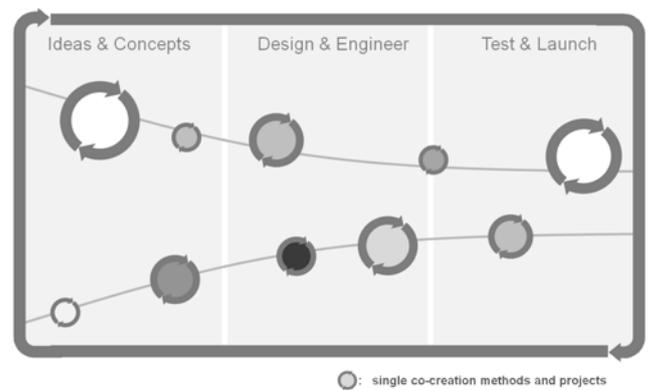


Figure 2: Co-Creation Roadmap along the NPD Process

## 2.3 Organization and Culture

The intention to implement co-creation activities along the NPD process definitely have major impacts on an organizational and cultural level such as an inherent change of a company's attitude from "not invented here" to an enthusiasm for ideas and innovations which were "proudly found elsewhere." At this point it becomes obvious that additional issues which are based on the fact that firms are often very persistent in sticking to "the old way of doing things" must be addressed. The "not invented here syndrome" manifested as the unwillingness to adopt an idea because it originates outside the company boundaries (Katz and Allen 1982) or limited "absorptive capacity" (Cohen and Levinthal, 1990; Vanhaverbeke et al. 2007) as missing mechanisms to distribute information throughout the firm and provide an environment whereby information can be exploited are two major challenges which need to be tackled from an organizational perspective to ensure co-creation success. Hence, the key to co-innovation is to overcome resistance and promote the willingness to accept that not all the smartest people work for your company. Rather it is essential to work with smart people inside and outside the company.

The Internet and many of its applications serve as key tools to manage the various spheres of interacting with

users, consumers or experts in networked environments. On an individual level transactions and social exchange on the Web changed our habits, expectations, and norms and became an essential part of our everyday life. However, when immersing in this information universe for business purposes there is still a sentiment of irritation for many company representatives in Marketing, R&D, Design and Research alike. Employees are confused by the lack of formal relationships and rules they are used to rely so heavily on in their daily business practices. Now we are at eye level with thousands and millions of users and we can simply ask for help, advice and creative ideas to solve problems. As a result of this “anytime communication mode” with consumers, well known interface discussions between market and technology driven departments (Souder 1988; Gupta, Raj, Wilemon 1986) will gain momentum again. It is not clearly defined yet who finally is in charge to involve the consumers in the value creation tasks. Should it be Marketing, R&D, Research or is it feasible for any of these areas at the same time? To the authors’ knowledge the ideal allocation of responsibilities and the role play to integrate users online in the different stages of the NPD has not been empirically investigated in depth.

A further issue referring to a culture of web-based co-creation is to set up incentive structures which takes users into account who act outside the company and are not legally linked via contracts of employment. From a user’s view engaging in co-creation activities can be considered as a function of intrinsic and extrinsic motivation. Consumers are intrinsically motivated if they value an activity for its own sake. They are extrinsically motivated if they focus on outcomes that are separable from the activity per se. Drawing on a rich body of motivation research relevant motives are “curiosity”, self efficacy”, “skill development”, “information seeking”, “intrinsic playful task”, “recognition”, “altruism and community support”, “make friends”, “personal need/ dissatisfaction” or “compensation and monetary rewards” (Füller, 2010; Csikszentmihalyi, 2002; Dahl and Moreau, 2007).

Research as well as the experiences made in numerous real business projects show that the intrinsic motivational dimension should be the focus to engage high involved, interested and creative co-creation partners. Nevertheless when more and more companies aim to co-create with users a sustained future motivational mix will consequentially include a balance of intrinsic and extrinsic incentives such as licensing models or other monetary compensations for successful user innovations. Firstly, the willingness to acquire, assimilate and exploit knowledge from engaged people outside the company; secondly a clear view about who should be in charge of the interaction and thirdly incentive structures which are also valid outside the company form a new co-creation culture and organization to utilize the full potential of users’ knowledge within NPD.

### 3. Application of a programmatic Co-creation approach in the Automotive Industry

The “Co-Creation Lab” as BMW Group’s latest

innovation approach addresses all essential dimensions of the programmatic approach introduced above. The lab is a virtual meeting place for individuals interested in car-related topics and eager to share their ideas and opinions on tomorrow’s automotive world with one of the leading car manufacturers. The web-based platform is designed to become a central hub offering various virtual user integration projects. Multiple activities and tasks relating to different automotive fields positioned at different stages in NPD can be accessed from the lab as a Meta-platform at the same time. The integrated methods range from idea contests, user toolkits, virtual concept tests, and innovation research studies up to lead user application forms (see Fig. 3; the Co-Creation Lab will be available in 2010).

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 Figure 3: inserted here (see Appendix)  
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Over time a logical sequence of the deployed methods and tools make up an ongoing co-creation roadmap allowing utilizing synergies of multiple single co-creation encounters. The history of user interactions is displayed and communicated on the platform. This initiative clearly indicates that the BMW Group is not only interested in their own research and development departments, but also in the creative minds outside the BMW Group in order to secure the long-term innovation and technology leadership.

The BMW Group Idea Contest "Tomorrow's Urban Mobility Services" is the first co-creation project which was launched within the lab in March 2010 (see Fig. 4). The crowdsourcing platform focused on ideas for innovative mobility services in cities and metropolitan areas of the future. Participants submitted their ideas on following topics:

*Mobility in general.* Ideas in this category refer to service solutions regarding different vehicle and mobility concepts for a variety of occasions, such as the everyday way to work or leisure trips.

*Parking.* Ideas in this category describe services regarding parking and cover topics such as the efficient and innovative use of parking space in urban areas, locating parking areas, payment services or additional services directly or indirectly connected to parking.

*Electric Cars.* This category deals with service ideas related to electric cars such as innovative solutions for charging or exchanging batteries, extension of possible travel distance or alternative usage of emission free cars.

*Networks & Communication.* Service ideas for the category "Networks & Communications" address topics like mobile services, inter car communication, and mobile Internet access. This category also deals with service ideas involving communication with mobility providers.

*Applications.* Service ideas for the category

"Applications" deal with software solutions which are either integrated in the vehicle's computer system or in mobile devices such as the iPhone and which offer certain helpful (micro)services regarding mobility, e.g. in the field of navigation or directed and undirected information search. Mostly, applications are updated regularly and/or are based on connectivity to the Internet.

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Attracted by the interesting innovation challenge of the contest, the open call of one of the leading car manufacturers to become a co-developer, and the appealing web 2.0 platform, within only 6 weeks more than 500 participants from all over the world joined the community to showcase their talent and submit their service ideas. In total, they created over 300 ideas and concepts in the different segments. A lively community evolved across cultural boundaries. Participants uploaded own avatars and pictures and evaluated the visually enhanced service ideas using an evaluation scheme ("I like this idea"; "I would use this idea"; "This idea is unique"). More than 8.600 evaluations were contributed. Additionally, members supported each other, explored relationships, provided feedback to each other and posted 5.000 comments and messages on service ideas and its improvements.

The idea contest provided several new insights for the BMW Group, as illustrated by a statement of a BMW Group manager:

"Each time we launch such an initiative we remain impressed by the creative potential. This contest showed once more, how important it is to integrate external sources into the development of new services and innovations. The generated ideas added innovative and valuable input to the topics we are already working on and confirmed us that the overall direction we are following leads into the right direction. We are eager to further pursue the generated ideas and establish fascinating mobility services for tomorrow's world."

Besides the promising outcomes of the contest in form of innovative ideas, numerous members also registered for the Co-Creation Lab and expressed their interest in further innovation tasks. Consequently, at the current time the BMW Group is considering to conduct another innovation contest via the Co-Creation Lab.

#### 4. Conclusion

The introduced programmatic approach implies the need to think of co-creation as a strategic programme rather than as a "just in time" outsourcing of innovation tasks. A co-creation programme is characterized by a continuous collaborative relationship with users consisting of various interactions along the innovation process including iterative internal and external cycles of acquiring and assimilating the users' value contributions. Eventually a co-creation programme supports the idea of a

continuously learning organization by expansion of its boundaries and should not be narrowed down to single project outcomes. It has been emphasized above that three major dimensions have to be taken into account. (1) Developing a co-creation skill set allowing to accomplish excellence in terms of methodologies, tools and experience; (2) continuous co-creation activities with alternating inbound and outbound flows between consumers and the company throughout the whole NPD process, starting from the fuzzy end to the test and launch of products, and (3) organizational structures and routines have to be established not only to acquire external input but also to assimilate, digest and capitalize on the value co-creation within the company.

The introduced example of the BMW Group Co-Creation Lab shows a recent application of a programmatic approach in co-creation. It is designed to host several different methods and tools for co-creation as well as to constantly feed the whole process of NPD with consumer input. The project also shows the synergies that can be used between a permanent co-creation hub and single innovation projects. While the platform enables to invite a number of users who have shown their creativity and skills in previous innovation tasks, the contest itself attracts additional individuals who are yet unfamiliar with the innovation platform. Most of them register as members to stay informed about new innovation challenges even after the particular innovation projects' end. In other words, both initiatives benefit from each other and their joint existence enables to use external creativity to the full extent.

While this paper outlines a conceptual framework of a holistic co-creation programme and a promising example of an application in practice, further research efforts are planned to systematically observe changes in co-creation culture and organizational impacts of the programme.

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## 6. Figures

Figure 3: BMW Group's Co-Creation Lab

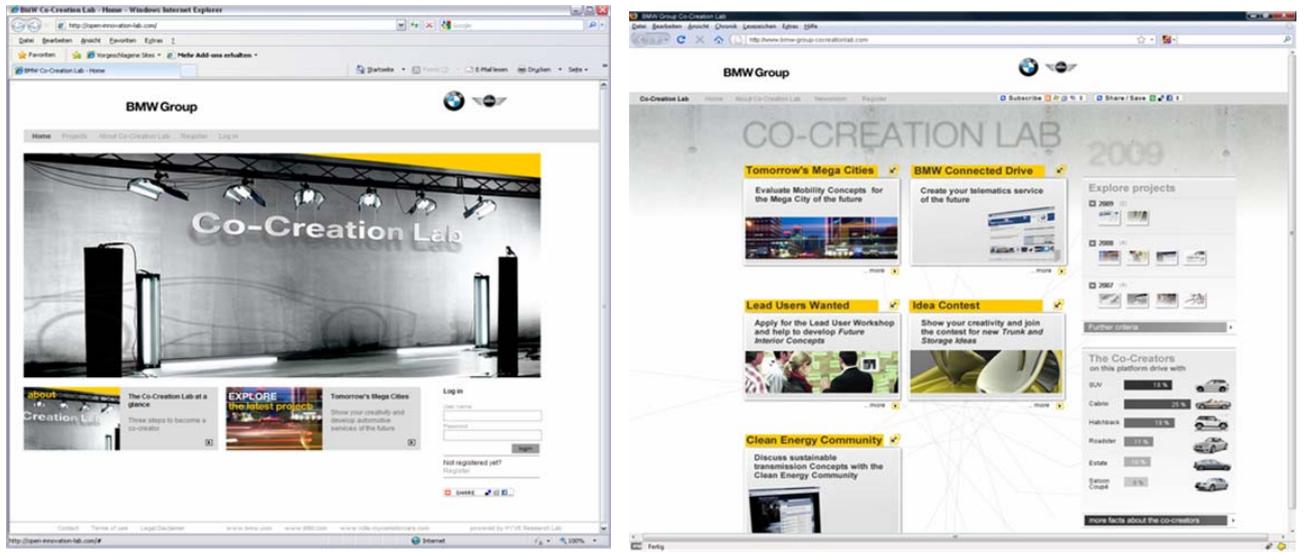


Figure 4: Crowdsourcing platform as integral part of the Co-Creation Lab (<http://www.bmwgroup-ideacontest.com/>)

