Social value creation: outline and first application of a resource management approach to innovation

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Abstract: This paper presents a resource management based concept of social value creation applicable to any innovation context within, as well as beyond, classic organisational borders. As such, it is being tested as an evaluation tool to measure the success of two thematically identical innovation projects: an intra-organisational and an extra-organisational idea contest. Results are being presented along with a critical assessment of the concept.

Keywords: value; social value; value creation; value measure; social capital; resource management; crowdsourcing; innovation; idea contest; automotive; community; sustainable innovation.

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1 Introduction

New, more open, social and sustainable forms of innovation are currently broadly discussed (Roth, 2009; Wagner, 2009; Almirall and Casadesus-Masanell, 2010; Mulgan, 2010). At the same time, a conceptual basis is missing to bridge the gap between the

classical, very technically and economically oriented innovation research and the new ways of thinking about innovation which are increasingly stressing social and sustainable aspects. Within this gap, the query of what determines value in these new forms of innovation keeps posing a particularly startling question. This paper aims to contribute towards closing that gap with a resource management based concept of social value creation that draws on existing concepts of social capital as well as on a compensatory model of motivation and volition.

The authors see the need for a strong contribution in this field not only owing to the common interest in advancing the relatively young topics of open, social and sustainable innovation, but also to offer a theoretically better grounded alternative to the now existing mostly commercially oriented constructs (Cooper et al., 2010; Joachimsthaler et al., 2010).

The paper is structured in a way that we start with a step-by-step introduction of all elements of our concept, beginning with our understanding of 'value'. After that, we are introducing our concept of 'social value' and finally integrate these two elements in a resource management framework. Following this, we will apply our concept to two thematically identical idea contests we have conducted in 2008 and 2009 within the automotive industry and will outline hypotheses predicted by our concept. Finally, we will look at the actual empirical results of these two projects and will critically assess the concept affording an outlook at future opportunities of application.

2 Social value creation: a resource management approach

2.1 The concept of value in innovation

The implicit concept underlying many explanatory approaches to value generation within innovation is still one of 'exchange value', reducing the value of new goods or services more or less explicitly to the *price* which they are or will be able to gain in a market-like exchange (Porter, 1985; Kotler, 2003). This is especially striking, as most economists today clearly differentiate between value and price of a product (Haksever et al., 2004). Furthermore, it is known that classic market processes often fail to indicate the true value of an innovation – especially if there is (still) no market for a new product (Pisano, 2006). Rather than looking for a possible valuation of not yet existing products it is thus necessary to take a deeper look into the process of *how new values are being created* by innovation (Bowman and Ambrosini, 2000). This means, it could be more fruitful to analyse the pathways of how new products *develop their value* rather than to simply watch what price tag a market might attach to them.

To this end, we first have to refine our understanding of value, making it elaborate enough to *discover all new value* an innovation might generate. This refinement goes along with sensitising and broadening our view on the human needs which are driving innovation. Other than an industrial or consumerist perspective, such a sensitised and broadened view is not restricted to those needs which can easily be served with marketable commodities (Long, 1999; Lin, 2001). To fully understand the processes of

value creation within innovation we have to avoid the common mistake of looking for 'efficient' technical shortcuts. Instead we have to recognise the *creativity* that is usually overlooked in common instrumental ways of innovation thinking. Such thinking cuts out all the complexity of human roles and interactions and leaves us with an overly simplistic surrogate model: the only vaguely humanoid *customer* (Long, 1999). The only way to avoid this consumerist trap way of thinking is to appreciate new ideas which are being valued regardless of whether they can or cannot be easily put to market – that means independently of whether they can be awarded an 'objectified' exchange value or not.

2.2 Social value creation in innovation

After having sensitised our general understanding of potential new values, we have to enter into the question of how these values are *being created*. Who creates new values if not the market? Like money, marriage or the law, the market is finally also 'only' a social construct (Kurnitzky, 1994; Plotkin, 2007). If we, however, want to find out about the *construction of value itself*, we should take a deeper look at the social processes underlying the creation of such social constructs – rather than taking their outcome for their own explanation.

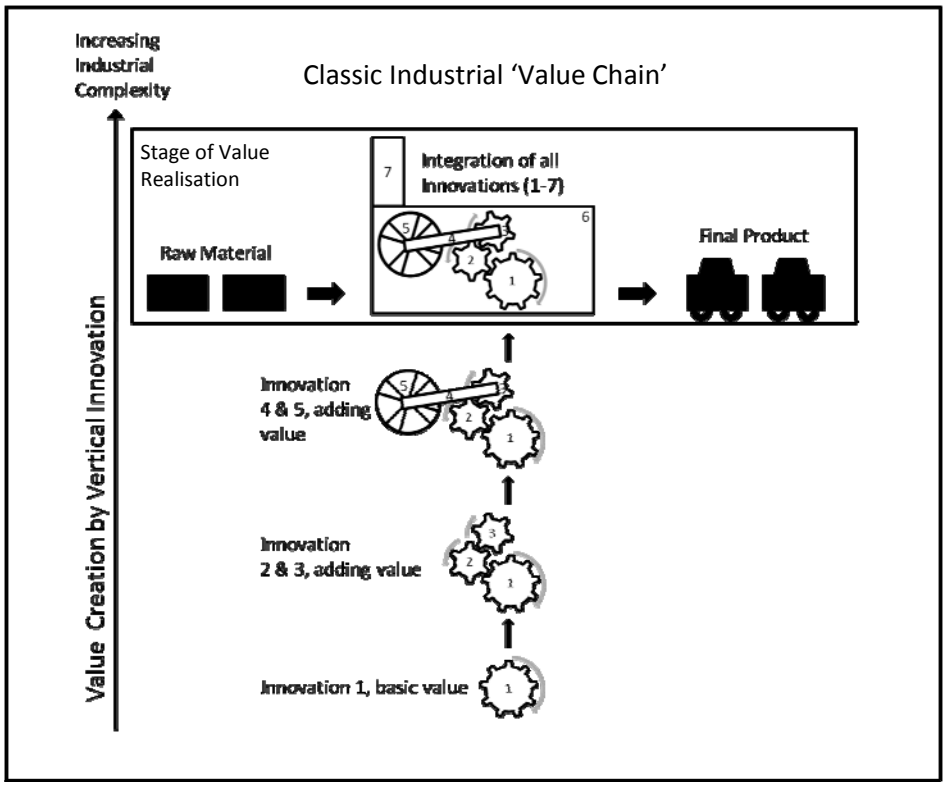
The insight into the genuine social character of value is not new – it can be found in publications as early as Schumpeter's (1908), where he writes:

> "*That it is society as a whole which sets values on things can be true in different senses ... it is only so long as an individual is isolated that the total as well as the marginal utilities of all commodities he may possess depend exclusively on him. All utilities are changed when he lives within society, because of the possibility of barter which then arises. This possibility alters at once the individual's appreciation of his goods. It has an effect on their values similar to the discovery of new ways of using them. Our individual will now put a new value on his goods because of what he can get for them in the market; and this new value depends on how much other people want them. This fact may be said to show a direct social influence on each individual's utility curves.*"

The social character of value creation has also been re-discovered more recently (Tsai and Ghoshal, 1998; Ramírez, 1999) and is staging a triumphal comeback with the establishment of the 'Open Innovation' paradigm, where innovation has suddenly become a naturally social task (Chesbrough, 2006; Roth, 2009; Almirall and Casadesus-Masanell, 2010).[1] However, almost all of this literature fails to explain how sociality creates value.[2]

The social character of value creation can best be explained by contrasting it to the practically still common industrial paradigm of value creation, in which customers are regarded as 'destroyers' of values previously created for them by producers (Ramírez, 1999). In this industrial paradigm, value creation is only possible in a closed, vertical funnel of increasing industrial complexity (Figure 1). In this funnel, value is being generated by every new idea or solution enabling or improving the transformation of raw materials into final products – constituting the process of value realisation.

Figure 1 Industrial model of value creation within innovation



Although practically useful as a model of innovation within traditional hierarchical organisations (Hauschildt and Salomo, 2007), this paradigm suffers from several shortcomings when it comes to actually explaining value creation within innovation:

1 It *confounds exchange and use value*: the paradigm does not differentiate between the value that is realised, when the final product is being sold (exchange value) and the value based on the subjective perception of the usefulness of the product ('use value'; see Bowman and Ambrosini, 2000). However, this differentiation is crucial when it comes to explaining the *generation of new value.* After all, 'price is what you pay and value is what you get. These two things are rarely identical' (Buffet, 2008). To explain the creation of new value, we are primarily looking for the social mechanisms behind the emergence of *new use value*. Sometimes there will be no exchange value in the beginning of an innovation, and only later commercialisation and possibilities for value capture will emerge.

2 In addition, it also confounds value creation with value capture, *limiting itself to commercially viable innovation*. Most innovation scholars have acknowledged the differentiation between invention and innovation, the latter being the former's implementation into practice (Schumpeter, 1934). However, this implementation does not necessarily have to be a commercial one – it may be any socially successful application of an invention (Brooks, 1982; McKeown, 2008). Recently, innovation

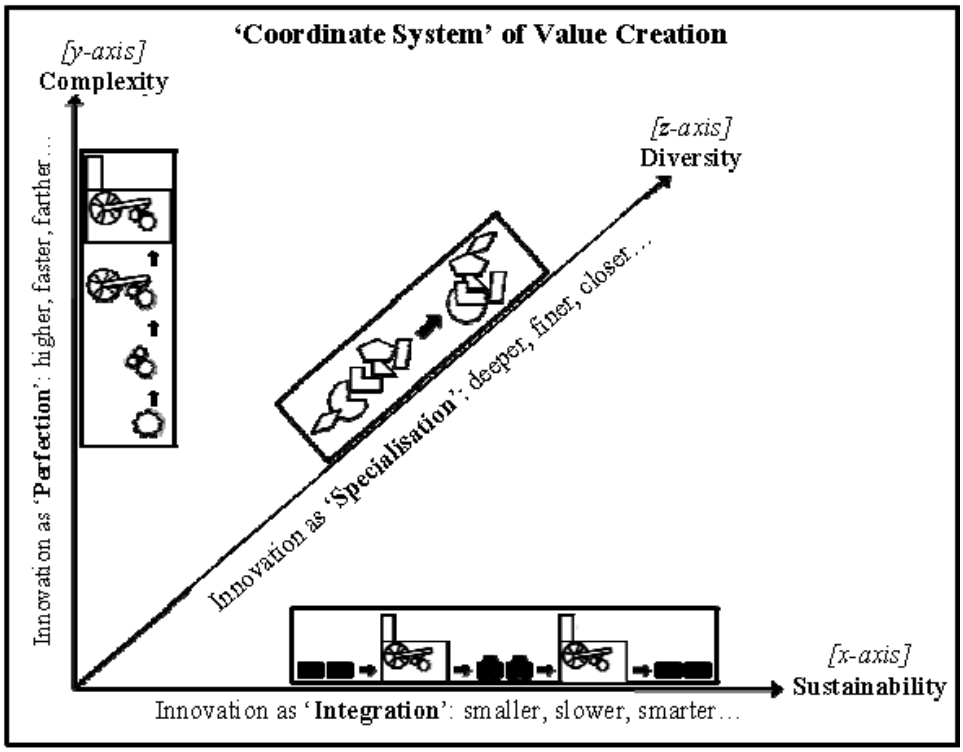
scholars are increasingly addressing the economical bias in innovation research as well as the need for more research on the social aspects of innovation (Roth, 2009; McDermott et al., 2009; Howaldt and Schwarz, 2010).

3 By building upon the inflexible consumer-producer dialectics the paradigm *excludes large parts of society from innovation processes*, making innovation an exclusive and closed company-internal task. This clearly contradicts empirically backed findings on the success of open innovation processes (von Hippel, 2005; Chesbrough, 2006; Wagner, 2009).

4 Ultimately and most importantly, this paradigm *does not explain how new value is created*. Rather than looking at the creation of real new value, it focuses on improving existing production processes by integrating small evolutionary innovations. This may even impede real breakthrough-innovation and the creation of 'real' new value coming with it.

In order to fix these shortcomings, we have revised and extended the classical model of value creation within innovation by adding two additional axes (Figure 2). These new axes reflect the context of diverse social interests (diversity/z-axis) as well as the need to integrate all social interests, both inter-personally and inter-temporally, to create sustainable value (sustainability/x-axis). Following this revised model will serve us as a basis to explain how new value is being created by social interaction following the principles of resource management.

Figure 2 Extended model of value creation within innovation



2.3 Social value creation based on principles of resource management

Before getting involved with the details of the value creation process, we want to clarify the axioms on which we are basing our further argumentation:

1 Innovation does not happen context free: it is an ongoing transformation on the basis of a *cultural context*. Humans are naturally 'cultural animals' with the innate capacity for cooperation[3] and social learning (Plotkin, 2007; van Schaik, 2007; Wyman and Tomasello, 2007). Every new generation and every new individual is basing its creative and innovative activities on the cultural fabric and social constructs of its ancestors, so all innovation is 'standing on the shoulders of giants' (Scotchmer, 1991).

2 All existing cultural context is *already reflecting a valuation* which has been carried out and implemented earlier. It can be understood as a basic agreement on principles of resource distribution and indicates what is generally valuable within a society, like the society-specific principles of justice (Plotkin, 2007). We will later refer to these already existing valuations of the given cultural context as 'explicit values' adapting Kehr (2004).

3 There is a *difference between 'value' and what is personally valued*: except for cases in which a society has deliberately decided so,[4] in liberal societies one individual alone is generally not able to create new value. The 'agreement'[5] of more than one member of a society is needed to change an existing valuation. Value results as aggregation of what is valued by a larger number of members.[6] The question naturally arising is of course: How many people are needed to generate new value?

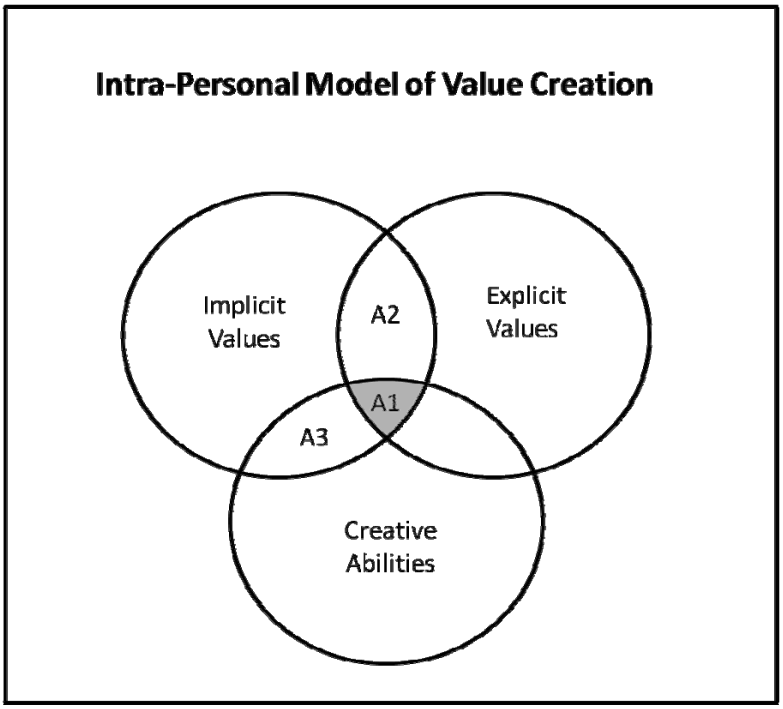
4 Because we are dealing with innovation and the question of *how new value originates*, we cannot just point to the market mechanisms which are becoming relevant only *after* the value has been created and answer: it needs exactly as many as to create an 'effective demand' (Mulgan, 2010). Instead, we introduce a more general, resource management perspective: it needs an *energetically favourable state* in which the newly generated value leads to an improvement of the energy balance of so many 'users' of this value that the aggregated improvement of their energy balance is greater than the aggregated impairment of the energy balance of the creators of this new value.[7]

5 Value, understood as aggregated valuation of all individuals in a society, is *constantly changing* – reflected by the diffusion of innovations (Rogers, 2003). With the ensuing concept of value creation we want to address the question of *what is causing this change*. Other than preceding scholars, we are not focusing on the product side of innovation as it represents only a fragmentary material reflection of the ultimately psychological[8] valuation process. In contrast to Rogers (2003), who identified certain success-relevant qualities[9] of innovations on the physical side, we are approaching innovation from the psychological side trying to identify the intra- and inter-personal mechanisms involved in creating new value.

To explain the psychological processes of value creation on the intra- and inter-personal level, we are adapting Kehr's (2004) Compensatory Model of Work Motivation and Volition. However, we are focusing on values rather than motives and on creative rather than perceived abilities (Figure 3). Starting with this intra-personal model we are assuming that the individual with its personal (implicit) values is in a constant need to adapt to the explicit values presented by its cultural context. Because both the society as well as the individual is constantly changing, there is no possibility of a 'perfect' adaption between individual and society.[10] The individual can only temporally optimise

the way it applies its creative abilities to explicit values in order to achieve its implicitly valued goals – or, in short, how it invests its resources in a given social situation in the subjectively optimal way. The grey-coloured overlap area A1 should reflect the extent to which the individual is able to optimally balance its own values with the values of its social surroundings without applying any extra resources.[11] In contrast, A2 represents an area in which the individual would like to interact with its surroundings, but lacks the abilities required, and area A3 is located outside the tolerated values of the society.

Figure 3 Intra-personal model of value creation



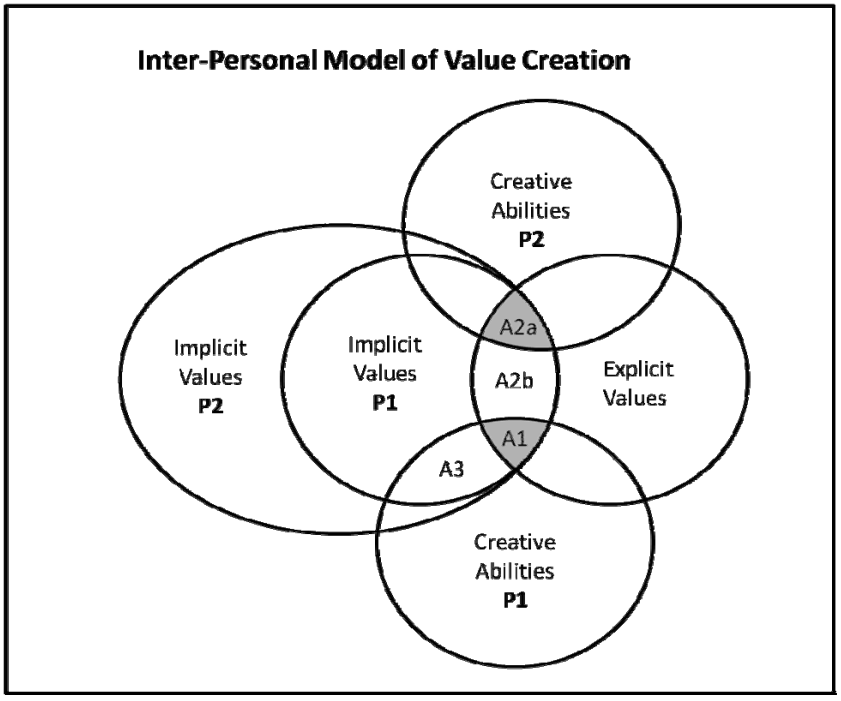
Source: Adapted from Kehr (2004)

In the pursuit to accommodate their abilities and implicit values the best way possible to the explicit values of the society, individuals are of course interacting with each other. Such an interaction will usually bring together individuals, who share interests and therefore have common implicit values. Such an encounter is depicted in Figure 4. Here it is assumed that two persons (P1 and P2) meet in the same social surrounding, thus sharing the same explicit values. Also, they share part of their interests, indicated by the partial overlap of their respective implicit value graphs. However, they have different, yet complementing, creative abilities. We might now assume that by pooling their creative abilities, P1 and P2 may both be able to extend their effective potential to reach their personal goals within their shared implicit values (bigger area A1 + A2a vs. formerly only A1). Also, it might happen that P1 and P2 actually learn from each other and mutually increase their own abilities. This would lead to an even bigger area of potentially effective satisfaction – in our model depicted as overlap area of implicit and explicit values. Further, the pooling of their abilities might bring about a creative recombination of their knowledge, with a not only quantitatively but also qualitatively

improved ability to transform and balance explicit with implicit values. Depending on the transferability of the knowledge generated out of such an improved ability, this would potentially qualify as new value creation: provided that there are other individuals with similar interests like P1 and P2 and they would be able to access and use the knowledge created in the interaction, this knowledge (or the products representing it) would constitute *new value*. Other like-minded individuals should adopt and use that knowledge because it would provide an energetically improved resource management for them: they too would be able to achieve more easily/more of their implicit values by applying the new knowledge of how to creatively balancing their corresponding implicit values against the explicit values of society.

Due to the arising complexity, it will probably not be feasible to transfer and apply our intra- and inter-personal models directly to real world situations to check for the potential for value creation in given social interactions. Thus, we do not suggest using our model directly. Instead, we propose measuring accompanying psychological correlates indicating a better or worse 'fit' of the three components: creative abilities, implicit and explicit values. Following Ryan et al. (1997), we would see an optimal fit being reflected by a high degree of 'intrinsic motivation' and low levels of subjectively perceived stress[12] of the involved individuals: The individuals should feel intrinsically motivated and only marginally stressed as they are able to creatively balance their own values with the values of their social surroundings – constituting a state of 'autonomy' (Ryan et al., 1997). Conversely, a bad fit would result in low levels of 'intrinsic motivation' and high levels of subjectively perceived stress of the involved individuals, as they would have to struggle or would actually fail to balance their needs with the values of society.

Figure 4 Inter-personal model of value creation



Source: Adapted from Kehr (2004)

Before practically applying this resource management concept we first want to integrate it with the extended model of value creation we have presented (Figure 2). In this model, we conceptualised three inherently different ways to innovate: to increase complexity, to gain diversity or to strengthen sustainability. These three paths are each related to different strategies how to create new value – meaning how to optimise the resource management of a substantial number of individuals by creatively balancing their implicit and explicit values as depicted in our intra- and inter-personal model (Figures 3 and 4). The path of increasing complexity should lead to solitary, but highly specialised, experts who integrate with their detailed knowledge instrumentally into the vertical value chain.[13] In contrast, the path of gaining diversity should favour partnerships and loose alliances between individuals from various backgrounds who share interests. The individuals capable of creating value in this second path (gaining diversity) should be inherently different in character from the innovators in the first path (increasing complexity).[14] Also, the second path should generally offer a greater potential to realise implicit values as well as to find real creative solutions through resource pooling and knowledge recombination. Finally, the third path (strengthening sustainability) requires innovators of high morality acting not only cooperatively but altruistically. Innovators on this path must have the ability to temporally delay the satisfaction of their own needs in favour of setting up a resource management which maximises the utility for a bigger number of individuals by extending either space or time of the resource optimisation context. According to Hoffmann (1975), on this path we would expect innovators with high levels of sympathetic motivation towards their social surroundings. This kind of motivation should result in altruistic behaviour of the innovators either towards their broader contemporary or towards their future social environment. As this pathway requires the most integrated and sophisticated thinking, we would expect here the highest creativity outcome and – once a working resource management is found – also the highest levels of intrinsic motivation.

3 Application of the concept

3.1 Short outline of the context of application

Following, we want to apply the concept to evaluate two crowdsourcing projects which we carried out from October 2008 until December 2009 with an internationally renowned automotive company. The two projects had been set up as idea contests and were designed to gain scientific insight into success factors of crowdsourcing as innovation method as well as to generate new ideas for the hosting company. All key figures of the two projects are presented within Table 1. The main idea of the study was to contrast internal with external idea generation. Therefore, the subject and basic settings of the two contests were, as far as possible, kept identical.

In order to view the main differences in outcome between the two contests, a special survey has been conducted with seven experts of the company who have actively supported the projects as senior innovation mentors. The results show what criteria they rated most important to evaluate the projects (Table 2) as well as in which aspects the two projects showed the biggest differences in results (Table 3). Both contests were accompanied by an online questionnaire to monitor the creativity of the ideas as well as the intrinsic motivation and the subjectively perceived stress of all participants. Further, the creativity of all ideas has been assessed by four company-internal experts.

Table 1 Key figures of the two crowdsourcing projects

	Internal idea contest	*External idea contest*
Subject	Aspects of future mobility (same as external)	Aspects of future mobility (same as internal)
Platform	Intranet	Internet
Accessibility	Only company employees	Everybody
Timing	Oct. 2008 – Feb. 2009 (5 months)	April – Dec. 2009 (idea generation 4 months)
Number of participants	N = 100	N = 358
Age of participants	Mean = 36.2* (n = 11; 23–46)	Mean = 35.1 (n = 163; 15–65)
Sex of participants	Male = 95%** (n = 18)	Male = 94% (n = 126)
Origin of participants	Germany (100%)	Germany (45%) Switzerland (17%) USA (16%)***
Number of ideas generated	88	909
Ideas/participant	0.9	2.5

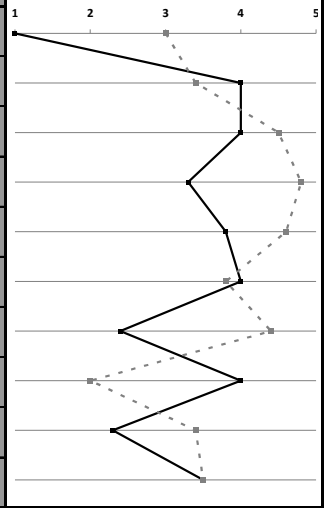
Notes: *Average age exhibits only limited reliability due to small sample size indicating age.

**Average sex exhibits only limited reliability due to small sample size.

***For detailed information about the origin of the participants see Figure 5.

Table 2 Comparison of the two crowdsourcing projects on the ten most important criteria, ranked by order of the importance of the criteria

Importance (1-15)	TEN MOST IMPORTANT EVALUATION CRITERIA as seen by 7 company-internal experts, ranked by descending order of importance on a scale of 1-15 (1: being the most important)	internal contest	external contest
1	*Market-relevant representative targetgroup-structure of the participants (as means of marketing research)**	1.0	3.0
4.0	Quality of ideas	4.0	3.4
4.3	Motivation of the participants	4.0	4.5
4.4	Degree of openness	3.3	4.8
5.7	Number of ideas	3.8	4.6
5.7	Open & replicable assessment of ideas	4.0	3.8
6.6	Internationality of the participants	2.4	4.4
7	*Confidentiality**	4.0	2.0
7.3	Number of participants	2.3	3.4
7.5	Functional supervision and integration in the corporate structure	3.5	3.5



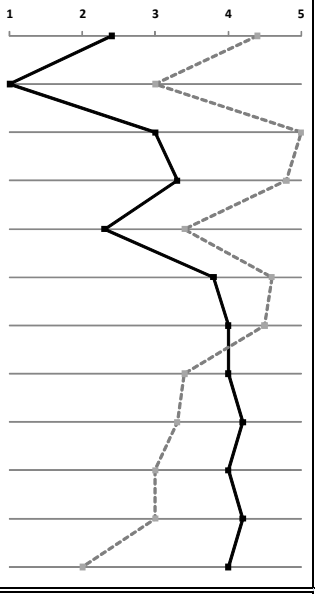
Note: *Criterion was introduced by one expert, rank is thus based only on one rating.

3.2 Application of the concept to the internal idea contest

If we now apply our resource management model of value creation to our empirical context we would place the internal idea contest somewhere close to the 'complexity' path of innovation, because participants were all recruited from inside the same company. Although an internal crowdsourcing project has the potential to bridge some organisational and hierarchical boundaries, it will not be able to completely wipe out the underlying socio-technical structure of the company. The daily routine of specialised tasks, as well as the continuously present impact of the organisational culture (Harris, 1994; Black, 2003) makes it generally difficult for participants to think truly creative. The organisational limits impede the participants from freely pursuing their implicit values. The underlying reason will often be fear of being held responsible for stepping outside one's functional role in the organisation. This should lead to a decreased level of 'intrinsic motivation' along with a decreased level of creativity and an increased level of subjectively perceived stress.

Table 3 Comparison of the two crowdsourcing projects on the criteria showing the biggest differences in result, ranked by order of the differences

Difference (External-Internal)	**CRITERIA WITH BIGGEST DIFFERENCES** between external & internal idea contest ratings, as seen by 7 company-internal experts, ranked by order of delta (delta > 0.5)	internal contest	external contest	Internal (black solid line) vs. external (grey dotted line) idea contest ranked on a five-stage ascending scale from 1 to 5
2,0	Internationality of the participants	2,4	4,4	
2,0	*Market-relevant representative targetgroup-structure of the participants (as means of marketing research)**	1,0	3,0	
2,0	*Drawings/Descriptions/Patents**	3,0	5,0	
1,5	Degree of openness	3,3	4,8	
1,1	Number of participants	2,3	3,4	
0,8	Number of ideas	3,8	4,6	
0,5	Motivation of the participants	4,0	4,5	
-0,6	Quality of ideas	4,0	3,4	
-0,9	Professional competence of the participants	4,2	3,3	
-1,0	Chance for implementation of the ideas	4,0	3,0	
-1,2	Reliability and credibility of participants	4,2	3,0	
-2,0	*Confidentiality**	4,0	2,0	



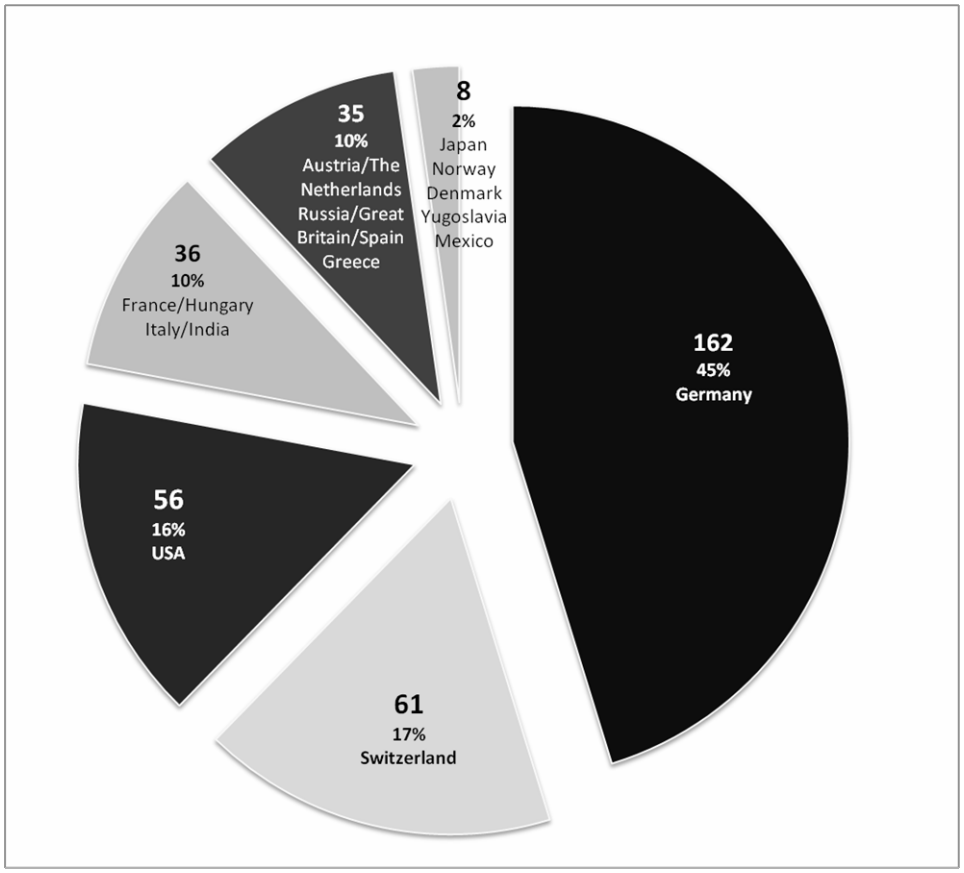
Note: *Criterion was introduced by one expert, rank is thus based only on one rating.

3.3 Application of the concept to the external idea contest

Whereas the problems of the internal idea contest with regard to creative value creation presumably lie within the restrictive organisational structure, the contrary may hold true for the external idea contest. Apart from some basic information posted on a designated website, participants were actually not sharing anything but a common interest in the

topic of the contest as well as some general trust in the company brand.[15] In terms of our concept, we would place this external contest rather on the 'diversity'-path of value creation. On this diversity path, innovation can only succeed if the innovators trust[16] each other, as well as the organisational setting at least insofar as they voluntarily pool their knowledge to apply their creative abilities together. Also, as the participants were from different countries, the explicit values of their respective social contexts supposedly varied significantly. However, this may not necessarily have been bad for the creative outcome as participants may have learned from each other about different strategies to balance their implicit values against different sets of explicit values. Based on the voluntary character of the contest, we can also assume that participants were actually genuinely interested in the topic and thus intrinsically motivated. We would thus predict higher levels of intrinsic motivation as well as higher creativity outcomes than in the internal contest and – due to the lack of organisational restrictions – less subjectively perceived stress.

Figure 5 Origin of participants of the external idea contest ($N = 358$)



4 Empirical results

As Table 4 shows, the empirical results generally seem to support our main hypotheses, especially with regard to intrinsic motivation: As predicted, intrinsic motivation was significantly higher within the participants of the external idea contest ($p \leq 0.001$). Also, subjectively perceived stress was higher in the participants of the internal idea contest, even though the difference was not found to be statistically significant. With regard to the extent of creativity of the ideas, our results display a somewhat mixed picture.

If we look at the creativity self-rating of the participants, we find a highly significant difference in line with our prediction: Participants of the external idea contest rated their ideas significantly more creative than the participants of the internal contest ($p < 0.005$). However, if we compare the means of the ratings of the four company-internal experts, the result turns around and the ideas of the internal idea contest are now showing up to be slightly more creative, however only at an inferior significance level ($p < 0.05$).

Table 4 Comparison of means between internal and external idea contest

External vs. Internal Idea Contest		*Self-Rating of Creativity*	*Four internal experts rating creativity*	*Intrinsic motivation*	*Perceived stress*
Internal Idea Contest	**Mean**	**5.1****	**3.6***	**5.4*****	**30.0**
	N	18	18	18	18
	s.d.	.97	.63	.69	14.4
External Idea Contest	**Mean**	**5.8****	**3.2***	**6.0*****	**27.2**
	N	102	100	128	125
	s.d.	.94	.70	.74	16.2
Total	**Mean**	**5.7**	**3.3**	**5.9**	**27.6**
	N	120	118	146	143
	s.d.	.98	.70	.76	16.0

Notes: * Means are significantly different on the level of $p < 0.05$.

** Means are significantly different on the level of $p < 0.005$.

*** Means are significantly different on the level of $p < 0.001$.

While trying to find the reason for this inconsistent result with regard to the creativity ratings, we analysed the single components of all creativity ratings, namely 'originality' and 'usefulness', and ran correlation analyses between self-rated and expert-rated originality and usefulness. As a result, we found no significant correlation between the originality-ratings but a significant ($p < 0.01$) negative correlation ($r = –0.27$) between the usefulness-ratings of self-raters and experts. This led us to believe that we might have found a 'not-invented-here' syndrome within our data: company experts assessed the ideas from outside significantly less useful than ideas coming from the internal contest.[17] This interpretation seems to be supported by the results of the expert survey on the main differences between the two contests: Here, seven company-internal experts rated the quality of the external ideas as well as the professional competence, reliability and credibility of the external participants considerably lower than the corresponding

qualities on the side of the internal contest ($\Delta > 0.5$ points, see Table 3) – and this although none of the internal experts practically experienced the competence, reliability or credibility of the participants nor the value of their ideas.

This interesting finding actually fits into our resource management concept of value creation: Like any individual, an organisation also has to run an *effective* resource management and therefore has the tendency to focus with its innovation activities on strategic areas congruent with its core values and abilities – to avoid uncontrolled investments bearing the danger of severe losses. We cannot confirm this with our data, but suspect, that any standard innovation management will therefore systematically undervalue potential value creation from outside the company and systematically overvalue the potential value stemming from internal ideas.[18]

5 Critical assessment of the concept and outlook

Overall, the results of our research provided some support for the existence of relationships as predicted by our resource management concept of value creation. The data presented especially suggest that an open social context, like in our external idea contest, helps avoid stress and favours the emergence of intrinsic motivation – which in turn may lead to more creative results.[19] Following our model, such highly creative results potentially constitute new value if transformed into innovations. However, there are several important issues in our concept as well as in the present research which have to be viewed very critically.

First of all, the empirical basis of our findings is too small to allow for any generalisation across industries or different types of companies. Further research with a greater and more representative data sample is needed to validate our findings.

Also, our concept suffers from limited practicability and several unvalidated assumptions. Although offering some basic plausibility, the model of new value creation from balancing implicit and explicit values still needs more detailed research and empirical verification. Moreover, our method of measuring intrinsic motivation and stress is by far not fully able to validate our concept. It will be necessary to set up a research design that can be tracked with a rigorous path analysis to verify causal relationships between resource management settings and externally validated value creation.[20] Another weak point in our concept is our model of value creation itself: By abandoning market value as a criterion for value we have put ourselves in danger of losing a widely acknowledged means of validation. However, we may have also contributed with this decision to the construction of new validation instruments which will eventually also be able to evaluate social and sustainable innovations (Mulgan, 2010).

We feel generally confident with the integration of sustainability as an own path of value creation in innovation. Unfortunately, our empirical data did not allow us to specifically test the application of this aspect of our concept. However, we see great potential for our concept in the field of sustainable innovation and hope that it will be practically applied there soon.

Further, we did not discuss the implications virtual innovation communities have. Our model constitutes an adequate basis to analyse how technologies can bring together creative people with shared interests and complementing creative abilities from diverse

social contexts. Nonetheless, it will take more research to understand how technologies can successfully improve the creation of new values and how they can be optimally integrated with more classical, closed paths of innovation.[21]

At last, we also did not give managerial advice how to use our resource management model of value creation to overcome any practical problems within innovation. Further, our model generally helps understand why companies are often unable to sufficiently cherish creativity inputs coming from outside the corporation (Pisano, 2006). However, our approach may also allow us to identify and improve situations in which a company-internal valuation is not sufficiently customer-oriented, sustainable, or simply not current enough to hold a successful market position.

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Notes

1 In our context, and with our goal of understanding the *social creation* of value, we want to explicitly refrain from citing any work in which 'social capital' is understood solely as 'investment in social relations with expected returns' (Lin, 2001). This concept is, firstly, itself based on social valuation (of relations), and secondly merely constitutes an unsophisticated way of commercialising and exploiting the social character of humans itself. This applies even more for commercial derivate concepts like 'social currency' (Joachimsthaler et al., 2010), which openly advocate capitalising on quasi-social activities of brands via the commercially-infiltrated social lives of their customers – a way of turning the social character of the customer against him and selling him back his own sociality.

2 One exception being Tsai and Ghoshal (1998), who present an interesting model of social value creation based on social interaction, shared vision and trust: however, with only thin empirical support and small effect sizes.

3 However, of course not all humans actually possess the same potential for cooperation.

4 Like in the case of testations and appointments by will.

5 This is also in perfect alignment with internationally common principles of law, especially with the principle 'Pacta Sunt Servanda' (Wehberg, 1959; O'Sullivan and Sheffrin, 2006).

6 Potentially including even unborn, future members of society, whose interests may be valued by the contemporary members of society leading a sustainable way of life.

7 At first glance, this approach seems to involve the danger of becoming self-referential. However, this danger exists only from an 'ex-post' perspective where the results of the value creation can be used to explain their own emergence: New value is then only be created if it saves more energy resources than its creation required – a somewhat trivial result. Any self-referential triviality is however lost if we instead focus on the creation-aspect of the process. The question arising here is: How should the existing resources of a person or an organisational entity be (re-)combined to ensure optimal energy-efficiency in pursuing their

needs/goals. Answering this question not only involves identifying these needs/goals but also knowing the structure and limitations of the person's or entity's social environment. Finally, the task of adapting the person/entity optimally to its environment is also no simple one-time solution but an ongoing interactive process as both sides – person/entity and environment – are in constant change.

8 As Haksever et al. (2004) point out, economists and engineers are mainly interested in determining the *inherent value of things per se*. However, if we believe Ramírez (1999), values do not reside 'in' a good, independent of the interactions to which it is subjected. It might be possible that innovation scholars have too readily adopted a pseudo-objective view on value in the course of ignoring or deflecting the subjective and intrapersonal processes of valuation. Distrust concerning the subjectivity of personal valuation and reluctance to accept it as a form of reality (Metzger, 1963) could eventually have played a role in this 'pseudo-objectification' of value research. Also, it is hard to overcome the still persisting technical bias within innovation which traditionally assigns value to technical 'advances' independently if/how they will be used later. This technical view is based on the unproven assumption that every new technique is per se valuable. This assumption is turning the process of value creation upside-down: Not man defines value and uses technique to achieve it but technique defines value and man has to adapt to still be valuable. This generally alarming view fails to recognise that per se technology does not contain any value – it is value-free and cannot set any standards for valuation – this can only be done by man.

9 Especially relative advantage, value compatibility, simplicity, trialability and observable results of an innovation. Rogers (2003) attributed up to 87% of the variation in the adoption of new products to these five qualities.

10 Also, an individual should normally not strive for a total adaption in the sense of an absolute conformation to the explicit values of society. This is because every individual has evolutionary needs to differentiate from others, to 'stand out from the crowd' to fulfil its biological tasks like finding mating opportunities, occupying niches for which it needs special knowledge and abilities.

11 Extra resources might be investments into gaining new knowledge, investments into building coalitions with other individuals to share knowledge, trying to use political influence to change explicit values, paying specialists to apply their knowledge or any other strategy which changes the setting of the three components of the model (creative abilities, implicit and explicit values).

12 For further details on the relation between creativity and stress see http://www.thomashirschmann.de/projekte-Dateien/ISHE2010.pdf.

13 This requires individuals with a very focused (more deep than broad) area of interest and the ability to permanently devote oneself to that area and 'function' in a highly structured technical and organisational environment without many possibilities for change or variation of tasks or routines.

14 Especially in a way that they should require more cooperative and social skills than the ones in the first pathway. Further they should need more abilities to work autonomously and more self-awareness about their implicit values to form the right alliances.

15 We assume that participating in an openly tendered contest requires trust and that this trust is related to the awareness and subjective trustworthiness of the organising brand.

16 For the importance of trust within open innovation communities, see also Fleming and Waguespack (2007).

17 Here we want to explicitly mention two other possible explanations for the inconsistency between the expert-ratings and the self-ratings of creativity: first, it may simply be a case of self-serving bias (Miller and Ross, 1975; Roese and Olson, 2007), where participants systematically overrate their own creativity. However, we know that intrinsic motivation is positively related to creativity (Amabile et al., 1986). Therefore, we checked the correlations between the self- and the expert-ratings of creativity on the one hand and the intrinsic motivation on the other hand: We found a significant positive relation only between self-rated creativity and intrinsic motivation ($r = 0.46$ at $p < 0.001$) whereas the expert-rating was even

negatively correlated with intrinsic motivation ($r = –0.25$, $p < 0.05$). This speaks against this alternative explanation, especially as such a self-serving bias should occur systematically across all participants from inside and outside the company. A second, probably more plausible, alternative explanation would be that the participants of the external contest in fact were either lacking expertise within the topic of the contest or knowledge about the strategic orientation of the company with regard to upcoming product innovations. As such knowledge can be instrumental to coming up with something inherently useful for the company, the participants of the external contest might have just missed capturing the essence of the actually company-relevant issues with the ideas they created. This, however, could only be a 'rationalised' explanation of a 'not-invented-here' syndrome, as one of the aspects of the external contest rated by company-internals as most important and most positive was the '*market-relevant representative target-group-structure of the participants (as means of marketing research)*' (see Table 2). This means, the company did an external contest to find out about the real needs of the target group, but then – after finding out –rated the ideas reflecting those needs systematically less 'useful' than their own ideas. This, however, could very well be a self-serving bias.

18 Which could also perfectly explained as 'ingroup bias' (Tajfel, 1970).

19 For the relationship between intrinsic motivation and creativity see Amabile et al. (1986).

20 For planning such a design, the study of Tsai and Ghoshal (1998) may be a helpful orientation.

21 Here our goal should not be to find the right balance between open and closed innovation (Almirall and Casadesus-Masanell, 2010), but to company-specifically define the respective concept of value creation by optimally applying and combining the three paths of value creation (increasing complexity, leveraging diversity and aiming for sustainability).