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## **SUPPORTING COLLECTIVE CREATIVITY WITHIN OPEN INNOVATION**

### **Abstract**

Dynamic and turbulent business environment with constant interventions of new technological, social and management innovations force the companies to seek new ways to bind the existing customers more tightly in the innovation process and at the same time, to attract new customers. The fierce competition of customer attention forces companies to create new attractive value creation methods to distinct from masses. Customizing products and services according to customer preferences might do the job for most of the customers but some advanced and enthusiastic customers want to have even more influence on defining process. Open innovation is a new emerging paradigm that includes close collaboration with customers in the innovation process, not just in defining the product features from predefined set of alternatives. Recent studies emphasize the need to support of collective creativity instead of individual creativity. Therefore, the aim of this study is to explore what motivates customers to collaborate in the innovation process and how this process can be enhanced by offering appropriate tools. A literature review of motivations to participate in online communities is presented and thereafter certain commercial web-based services supporting community collaboration and brokering are illustrated. These cases are also contrasted with Web 2.0 business models to find out what kinds of information systems and toolkits should be used in different communities with different members' motivations.

Keywords: brokering, creativity, collaboration, community, information system, open innovation, motivation, mass customisation, Web 2.0.

# 1. INTRODUCTION

## Background of the study

Today's average customers are more demanding and harder to attain than ever before. The emergence of information age followed by information overload has driven companies to fight over customers' attention (Davenport and Beck 2001, Thrift 2006). Companies are forced to become more customer-centric and motivate customers to become co-innovators. As competition on customer attention becomes fiercer and fiercer, companies have developed new organizational answers to response to growing customer needs. Companies have started to produce customer experiences in addition to products and services to draw customer attention (Pine and Gilmore, 1999). Mass Customization, customizing products and services according to individual preferences of each customer at the prize of comparable to mass production alternatives, is an other innovative approach available thanks to new information and communication technologies. In mass customization approach customers can define much of the features and appearance of the products through different kinds of configuration tools.

Empowerment of customers is common trend in all sectors of businesses. The value proposition of some pacesetter companies is not anymore the products or services that they have to offer, but methods, tools, and opportunities for *Interactive Value Creation* where customers themselves create much of the value they obtain. Interactive Value Creation (Interaktive Wertschöpfung) is a term developed by Reichwald and Piller (2006). This term is closely linked to mass-customisation and customer experiences (see Pine and Gilmore, 1999). Interactive Value Creation means that customers are a strategic resource for manufacturers and closely integrated with them in the value creation network. When customers learn to use different kinds of configuration tools and get accustomed to have power to change product features, they become even more demanding. Some customers are already willing to participate in the innovation process of new products.

*The new understanding of innovation currently shows up as three associated developments: as the mobilization of forethought, as the deepening of the lure of the commodity through the co-creation of commodities with consumers, and as the construction of different kinds of apparently more innovative space suffused with information technology. (Thrift, 2006)*

This mobilisation of forethought means those activities to motivate customers to participate and to utilise their creativity and problem-solving skills. Recent studies (Hargadon & Bechky 2006, Farooq, Carroll and Ganoë, 2005) emphasize the need to support group creativity instead of individual creativity. Co-creation of commodities is herein inspected through Open Innovation (Chesbrough, 2003) and Interactive Value Creation (Reichwald & Piller, 2006). This construction of innovative space is viewed here through toolkits (von Hippel and von Krogh 2003, von Hippel 2005), brokering (Hargadon and Sutton, 1997) and information system design rules (Farooq *et al.*, 2005).

The innovation process is radically changing as customer and user involvement has become central part of the innovation process. Henry Chesbrough (2003, 2006) calls this phenomenon Open Innovation. He emphasises the rise of intermediaries and development of new business models. According to Chesbrough (2006, 14): “As innovation becomes a more open process, intermediate markets have now arisen in which parties can transact at stages which previously were conducted within the firm”. However, the view of Chesbrough does not fully consider users and customers innovating between themselves, even outside company’s influence. Therefore we will present the Interactive Value Creation (Reichwald and Piller, 2006) view and illustrate brokering activities of intermediaries (Hargadon and Sutton 1997, 2000).

Creativity is the ability to produce work that is both novel (i.e. original, unexpected) and appropriate (i.e. useful, adaptive concerning task constraints) (Sternberg and Lubart, 1999). To invoke user interest and creativity, companies utilize certain design tools and toolkits. Users interested in designing their own products want to do it efficiently. Manufacturers can therefore attract them to kits of design tools that ease their product-development tasks and to products that can serve as “platforms” upon which to develop and operate user-developed modifications. (von Hippel, 128, 2005)

Within this article, we are interested in those toolkits for collective creativity. To be able to maximize the efficiency of individuals’ innovation, it has been found that collective thinking is in important role (e.g. Hargadon and Beckhy 2006, Thrift 2006). Therefore, we are especially interested to find out what kind of toolkits are needed for different phases of customer interaction to efficiently and effectively combine private-collective and commercial features of open innovation. The Figure 1 below illustrates some of the different toolkits used for different phases of open innovation.

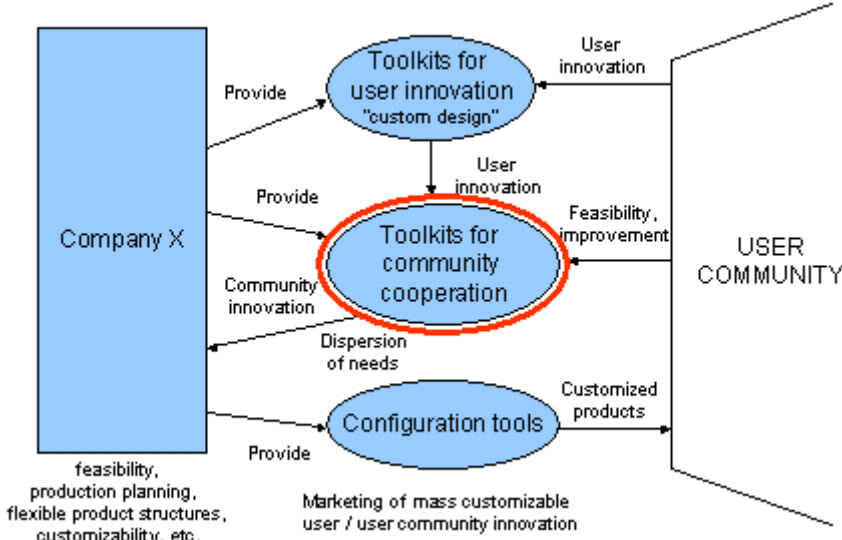


Figure 1. Toolkits for user innovation, community cooperation and mass customization.

When looking at the figure 1, there are many research literature examples of toolkits for user innovation (Hippel 2005) and for mass customization (Franke and Piller, 2003). However, toolkits for community cooperation are seldom covered in the literature (Reichwald and Piller, 2006). Therefore, focusing on toolkits for community cooperation can be seen novel in this research paper.

## **Purpose and methodology**

Therefore, the aim of this study is to explore what motivates customers to collaborate in the innovation process and how this process can be enhanced by offering appropriate tools. The Internet and online communities provide various data collecting methods including questionnaires, interviews, observational techniques as well as using experimental methodology (Hewson, Yule, Laurent and Vogel 2003). However, in this article we will base our findings on case-based reasoning. Three co-design services are introduced and utilised as case examples of user-based innovation. From our examples and data we try to identify regular patterns of collaborative design and problem-solving processes. To offer a dyadic perspective about the studied phenomenon, we consider both viewpoints, customers as innovators and companies as offering motivation and tools for innovation.

The rest of the paper is structured as follows. We start by discussing about the Open Innovation (Chesbrough, 2003) paradigm, Interactive Value Creation (Reichwald and Piller, 2006) and creative communities. After that we review the earlier literature considering what attracts and motivates customers to involve in innovation processes. Then we consider different methods, Web 2.0 business models and toolkits in attracting customers to participate and contribute in companies' development. We also discuss about three existing cases to exemplify how these tools have already being utilized. Finally, in the conclusions chapter we summarize our findings.

## **2. OPEN INNOVATION, INTERACTIVE VALUE CREATION AND COLLECTIVE CREATIVITY**

### **Open innovation paradigm versus Interactive Value Creation**

West and Gallagher (2006) define Open Innovation as systematically encouraging and exploring a wide range of internal and external sources for innovation opportunities, consciously integrating that exploration with firm capabilities and resources, and broadly exploiting those opportunities through multiple channels. Firms practicing open innovation face three inherent management challenges, which are 1) *maximization* (including outbould licencing of IP, patent pooling and even giving away technology to stimulate demand for other products), 2) *incorporation* (firms need to identify relevant knowledge through scanning, recognitions, absorpction and political willingness to incorporate external innovation) and 3) *motivation* (*firms must cultivate ways to assure continued supply of relevant external technologies and IP*). (West and Gallagher, 2006, 82)

Within this article these three challenges by West and Gallagher (2006) are linked to management of communities. User communities utilising toolkits manufactured by firms are able to supply continuously value for firms. However, to enable value creation, the motivation structures of communities need to be understood.

How is Open Innovation then different from Interactive Value Creation? Interactive Value Creation adds a new form to classical organizational forms (hierarchy and market), namely Self-selection and Self-organisation. Tasks are in this form divided between specialized actors whose motivation is based on (own) benefit stemming from collaborative achievements and social motives (Reichwald & Piller, 2006). These steps, self-selection and self-organization is missing from Open Innovation definitions ( e.g. Chesbrough 2003, 2006; West and Gallagher 2006). Self-organisation can be explained by inspecting collective cognition and collective creativity.

### **From collective cognition to collective creativity**

Earlier studies have shown that collective cognition in organizations has a significant effect on individual cognitive processes (Meindl *et al.* 1996, Thompson *et al.* 1999, Hutchins 1991) to explain supraindividual cognitive processes. The concept of collective mind may explain the reasons why collaborative working in especially highreliability organizations increases the efficiency (Weick and Roberts, 1993). Furthermore, the concept of collective mind may also help explain highly creative organizations, where the emphasis on novel solutions also requires mindful exploration (Hargadon and Bechky, 2006).

Toolkits for collaboration and mass-customisation can be seen here as devices supporting collective mind and distributed cognition. The establishment of distributed cognition devices, intended to organize real life experiments as preferences, tends to blur habitual distinctions between production, distribution and consumption (Thrift, 2006, 279). The same users can act as designers and consumers of others' designs. This will be demonstrated in the chapter 5.

Persons are to be trained to conjure up 'unthinkingly' more and better things, both at work and as consumers, by drawing on a certain kind of neuroaesthetic that works on the myriad small periods of time that are relevant to the structure of forethought and the ways that human bodies routinely mobilize them to obtain results, to produce more of the kind of ideas that seem to just turn up, which, in reality, are thoughts that we are forever prevented from becoming directly aware of .... further, it has become clear that affectively binding consumers through their own passions and enthusiasms sells more goods (Thrift, 2006, 286). But what are those interaction types that enable collective creativity?

Hargadon and Bechky (2006) introduce a model of collective creativity which consists of four types of social interaction: *help seeking*, *help giving*, *reflective reframing* and *reinforcing*. This suggest that *help seeking* can be seen as a set of actions that individuals used to induce others to join in efforts to resolve a particular problematic situation, help-seeking behaviours, and that play a necessary role in enabling moments of collective creativity.

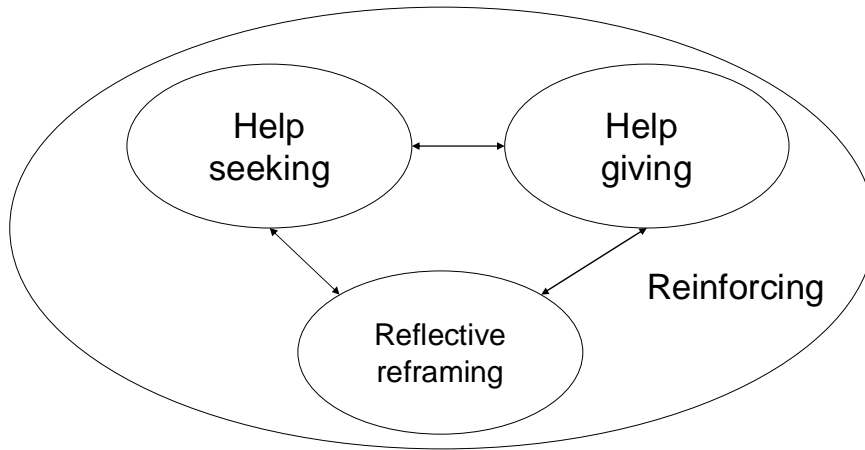


Figure 2. Interaction precipitating moments of collective creativity (Hargadon & Bechky, 2006)

Furthermore, Hargadon and Bechky (2006) call *reflective reframing* the moment when participants in social interactions make new sense of what they already know comprise a third important aspect of collective creativity. They suggest also the fourth item, reinforcing activities, support individuals as they engage in help seeking, help giving, and reflective reframing and, as a result, they are also critical to enabling those moments when collective creativity emerges. This is analogous to Amabile's (1983) Componential Framework of Creativity. This framework includes three major components: ... "Domain-Relevant Skills" can be considered as the basis of for any performance in a given domain... "Creativity-Relevant Skills " include cognitive style, application of heuristics for the exploration of new cognitive pathways, and working style. ... "Task Motivation" includes motivational variables that determine an individual's approach to a given task. (Amabile, 1983, 67). "Because collective creativity takes place in moments when any one individual does not hold all of the necessary knowledge to construct a creative solution, the potential for a creative solution requires the domain-relevant skills of multiple participants". ... The characteristics like curiosity, a habit of reaching out for ideas and help, and a mixture of confidence and humility-help create a highly collaborative culture within knowledge-brokering firms or groups. (Hargadon and Bechky, 2006, 495). Brokering processes, brokers and their characteristics in Web 2.0 communities will be discussed further in the chapter 4.

### **3.MOTIVATIONAL DRIVERS – HOW AND WHY CUSTOMERS PARTICIPATE IN THE INNOVATION PROCESS ON THE WEB**

#### **3.1. From communities of creation to communities of co-design**

Unlike the traditional communities of practice (Wenger, 1998), Open Source Software (OSS) and other user developer communities span *organizational* rather than functional boundaries to create common knowledge and value (Gibbert, Leibold & Probst, 2002). Thus, they are also called *communities of creation* (Sawhney & Prandelli, 2000) or *communities of innovation* (Wikström, 1996). Communities of creation reflect expert knowledge of customer groups which interact not only with one company, but importantly also with each other.

They consist of groups of people who work together over a longer period of time, have interest in a common topic, and want create and share knowledge. Alike communities of creation, *communities of co-design* (Piller et al., 2004) provide common support in the case of goods which can be finally configured (co-designed) by the customer. Special community features are used to support the individual or collaborative configuration (co-design) process. Involving different customers and breaking down the barriers among users opens several possibilities for improving the individual configuration process. While communities of creation address the creation of a new solution space, communities of co-design use an existing one for the purpose of configuration (of a customized product).

### **3.2 Motivations to participate in online communities**

Since online communities enable customers to participate in the innovation process we start by considering the reasons why to participate them. Researchers in the online community research field have considered reasons why people join and visit online communities and what are the attraction factors of online communities. Although, these studies approach the phenomenon from different perspectives than attraction, some of them are close to the one of the present study. Therefore, these studies offer interesting insights into this study. Previous studies about members' reasons to visit to online communities are gathered in Table 1.

Author	Reasons/ motivations to visit or join in	Main emphasis in the study
Antikainen (2007)	16 Attraction factors can be divided between members, member-to-maintainer, member-to-service and member-to-brand	Attraction factors of company online communities
Bagozzi and Dholakia (2002); Dholakia, Bagozzi & Pearo (2004)	Individual motives, social influences and social identity	Motivations to join, psychological perspective
Gruen, Osmonbekov and Czaplewski (2005)	Factors that are divided into motivation, opportunity and ability	C-to-c knowledge exchange
Hagel and Armstrong (1997)	Interest, relationship, fantasy games, transactions, many needs simultaneously	The economical benefits of online communities
Kollock (1999)	Anticipated reciprocity, increased reputation, sense of efficacy	Motivations to contribute
McKenna and Bargh (1999); McKenna and Green (2002)	Self-related: stigmatised and constrained identities Social related: social anxiety, loneliness, hectic lifestyle, safety issues	Motivations to join, psychological perspective
Ridings and Gefen (2004)	Exchange information, social support, friendship, recreation, common interest, technical reasons	Reasons why people visit online communities
Wasko and Faraj (2000)	Tangible returns, intangible returns and community interest	Knowledge exchange
von Hippel and von Krogh (2003)	Personal learning and enjoyment from programming.	Open source communities

Table 1. Summary of the earlier studies about reasons to participate online communities

Individuals may contribute valuable information because the act results in a *sense of efficacy*, that is, a sense that they have had some effect on this environment. There is well-developed research literature that has shown how important a sense of efficacy is (e.g. Bandura 1995), and making regular and quality contributions to the group can help individuals believe that they have an impact on the group and support their own self-image as an efficacious person. Wikipedia ([www.wikipedia.org](http://www.wikipedia.org)) is a prime example of an online community that gives contributors a sense of efficacy. Wikipedia is an online encyclopaedia which uses online software to enable anyone to create new articles and change any article in the encyclopaedia. The changes the members make are immediate, obvious, and available to the world.

*Reputation* is important to online contributors such that, in general, individuals want recognition for their contributions. Profiles and reputation are clearly evident in online communities today. Amazon.com is a case in point, as all contributors are allowed to create profiles about themselves and as their contributions are measured by the community, their reputation increases. With eBay (www.ebay.com) that is an online auction site, members have the opportunity to rate their experience with someone they have traded. This has an effect on the sellers or buyers reputation score. The reputation is linked to the role that a member has, and therefore, it is considered to include under roles attraction factor.

Approaching motivation from psychological perspective, McKenna and Bargh (1999) built a conceptual framework about internet social interaction. In their framework they have divided the type of motivation into *self-related* and *social related* types. As self-related motivators they mention stigmatised and constrained identities. According to them, the behaviour deriving from self-related motivators are disclosure of secret aspects of self and becoming the ideal self. As social motivators they mention social anxiety, loneliness, hectic lifestyle and safety issues. Moreover, the behaviour deriving from the social motivators are disclosure to gain intimacy, presenting the ideal self to gain approval and acceptance and forming relationships. (McKenna and Bargh 1999)

Bagozzi and Dholakia (2002) and Dholakia et al. (2004) have as well been interested in participants' motivations visiting online communities. They have built a *social influence model* of consumer participation in online communities, which consists of three parts: *individual motives* for participation in the online community, *social influences* on member participation in the online community and *social identity* in the online community. Furthermore, individual motives are divided into purposive value, self-discovery, maintaining interpersonal interconnectivity, social enhancement and entertainment value.

Wasko and Faraj (2000) explored reasons why people participate and help each others in online communities. They concentrated on *knowledge exchange* and therefore, they empirically explored three technical communities in their study. They asked participants an open-ended question by e-mail, about why they participate and help others and got 342 answers. In analysing data they utilised content analysis and divided the results into three general categories *tangible returns*, *intangible returns*, and *community interest*. Firstly, by tangible returns they meant access to useful information and expertise, answers to specific questions, and personal gain. Secondly, intangible returns refer to intrinsic satisfaction and self-actualisation. Thirdly, they said that the majority of comments received (41.9%) reflect a strong desire to have an access to a community of practice. According them, these comments indicate that people are participating in order to exchange knowledge pertaining to practice, and they value the exchange of practice related knowledge within a community of like minded members. In addition, Wasko and Faraj (2000) stated that these comments indicate that people do not use the forum to socialise, nor to develop personal relationships. According to their study giving back to the community in return for help was by far the most cited reason for why people participate.

#### 4. TOOLKITS SUPPORTING MOTIVATION AND WEB 2.0

Firms that understand the distributed innovation process and users' roles in it can change factors affecting lead user innovation and so affect its rate and direction in ways they value. Toolkits for user innovation custom design offer one way of doing this. This approach involves partitioning product-development and service-development projects into solution information-intensive subtasks and need-information-intensive subtasks. (von Hippel, 2005, 16)

Users interested in designing their own products want to do it efficiently. For example, some manufacturers provide users with toolkits and configurations to customize and even design their own products in mass-customization context. Product beta-testing is another example of use of user communities.

How should a web-based service be designed to support collective creativity? Farooq et al. (2005) suggest three design implications to support creativity within information systems (IS): 1) Integrate support for individual, dyadic, and group brainstorming; 2) Leverage cognitive conflict by preserving and reflecting on minority dissent and 3) Support flexibility in granularity of planning. Furthermore, Farooq et al. (2005, 222) explain minority dissent: "the skeptic voices are important and these traces should be kept visible in the IS" and there should discussion about them along the line. Farooq *et al.* (2005) point out that social networks and their management is a crucial part of creativity.

Social networks are currently discussed under a concept called Web 2.0. This concept was originally developed by Tim O'Reilly.

**Web 2.0** means second generation of Internet-based services such as social networking sites, wikis, communication tools, and folksonomies that emphasize online collaboration and sharing among users. The complex and evolving technology infrastructure of Web 2.0 includes server-software, content-syndication, messaging-protocols, standards-based browsers with plug-ins and extensions, and various client-applications. These differing but complementary approaches provide Web 2.0 with information-storage, creation, and dissemination capabilities that go beyond what the public formerly expected of Web sites. Some Web sites that potentially sit under the Web 2.0 umbrella have built new online social networks amongst the general public. (Wikipedia, 2007)

In the following table some Web 2.0 elements are illustrated.

<b>Web 2.0 element</b>	<b>Description</b>	<b>Typical case</b>
1. Early entry / first mover	A successful Web 2.0 company is characterised by being able to bring together a large number of users / subscribers and facilitating and encouraging interaction between them.	Innertee
2. Constant improvement, innovation and value	A web 2.0 site must constantly provide new and fresh reasons for members of the community to engage.	Innocentive
3. Local and Global Support	While the global economy is at the forefront of everyone's mind, the reality is that the majority of business and social networking is intra-national and often geographically focused .	Bookmooch
4. A platform for others	Sites that allow others to establish and develop businesses on top of it, serving as a platform for communication and commerce have often distanced themselves from their competitors.	Innocentive
5. User content as an attraction	Internet users are finding user-driven content as compelling as, and perhaps even more refreshing than traditional content from magazines, TV networks and film studios.	Innertee

Table 2. Factors driving the success of Web 2.0 businesses (Armapartners, 2006) with case-examples.

Like shown in the table 2, Web 2.0 is as much a business model as it is a platform for communication. A business model has two important functions. It must create value within the value chain: and it must capture a piece of value for the focal firm in the chain (Chesbrough, 2006). This piece of value is sometimes difficult to recognise as customers expect more and more services to be free of charge. Those cases in the table 2 and their value creation mechanism are introduced in the next chapter.

Web 2.0 elements have some similarities with technology brokering (Hargadon and Sutton, 1997) and knowledge brokering (Hargadon and Sutton, 2000). Technology brokering means a strategy for exploiting the networked nature of the innovation process and building new communities around innovative recombinations. The recent Open Innovation paradigm (Chesbrough 2003, 2006) emphasizes those brokers (intermediators) and their role in the innovation process. According to Chesbrough (2006, 14): “As innovation becomes a more open process, intermediate markets have now arisen in which parties can transact at stages which previously were conducted within the firm”. Certain Web 2.0 services and organisations maintaining those services in the Internet act as brokers. The technology brokering process model (Hargadon & Sutton, 1997) is based on the structural holes theory by Burt (1992). This theory suggests that innovators can innovate routinely because they occupy a “structural hole”, a gap in the flow of information between subgroups in a larger network. For innovators, these gaps exist between industries where there was and was not knowledge about the new emerging technologies. Actors filling these gaps are brokers who benefit by transferring resources from groups where they are plentiful to groups where they are dear (Hargadon & Sutton, 1997, 717). Brokers within this definition are those users or organisations that utilise the information of other users to create innovations.

Knowledge brokering is a similar concept to technology brokering. Knowledge brokering by Hargadon & Sutton (2000) includes four phases: 1) Constantly Capturing ideas, 2) Keeping these alive 3) Exploring new uses for them 4) Building prototypes to test them out. Ideas can be born as individual output but their refinement is always group-based activity. Users with toolkits should be allowed to capture, collect and organise ideas. Exploring new uses means that ideas can be mixed and utilised for different purposes. Building prototypes mean that user can create design and solutions which are evaluated by the community for their novelty and value. In aim to give a practical viewpoint about what kinds of solutions to enhance collaborative innovations among customers already have been made, we look closer at three web-based service case studies.

## **5. HOW TO ENHANCE CUSTOMERS’ COLLABORATION – EXPLORING THREE CASES**

### ***Bookmooch (<http://www.bookmooch.com>)***

BookMooch is a book exchange service for used books. Users act as administrators, translators and content producers in the community. Every time a user gives someone a book, that user earns a point and can get any book he or she wants from anyone else at BookMooch. Once the user has read a book, the user can keep it forever or put it back into BookMooch for someone else. There is no cost to join or use this web site: only cost is mailing books to others. Users receive a tenth-of-a-point for every book they type into the system, and one point each time they give a book away. In order to keep receiving books, the user needs to give away at least one book for every five received. Founders of BookMooch earn money every time a user can not find a book in the BookMooch and decides to navigate and purchase a book in Amazon through Bookmooch user interface.

*Analysis:* In the case of Bookmooch it can be concluded that members' motivations include both self-related reasons, for example information exchange and learning (e.g. Kollock 1999; Wasko and Faraj 2000), and social reasons, ie. creating friendships, sense of community and reciprocation (e.g. Dholakia et al. 2004; Ridings and Gefen 2004). The company behind Bookmooch has built a simple web-interface to allow users to log in and communicate with each other. However, those connections to other services like Amazon (<http://www.amazon.com>) has been made transparent so that users may stay in the Bookmooch user interface even if they utilise Amazon services. This provides both users and the company additional value.

***Innocentive*** (<http://www.innocentive.com>)

Pharmaceutical maker Lilly launched InnoCentive in 2001 as a way to connect resources outside the company – people who could help in developing drugs. From this starting point, InnoCentive invited other firms which were also interested in ad hoc experts. Companies like Boeing, DuPont, and Procter & Gamble now post their scientific problems on InnoCentive's Web site; anyone on InnoCentive's network can take participate in solving them.

The companies – or seekers, as InnoCentive calls them – pay solvers from \$10,000 to \$100,000 per solution. (They also pay InnoCentive a fee to participate.) The non-profit Rockefeller Foundation area on InnoCentive's scientific platform will focus on solving the most pressing and complex humanitarian challenges posed by non-profit entities selected by the Foundation. Under the agreement The Rockefeller Foundation will select non-profit entities and others with charitable intent eligible to use the InnoCentive platform under preferred conditions, and will pay access, posting and service fees on their behalf to InnoCentive, as well as challenge awards to those researchers solving the technology problems the non-profits pose.

The Foundation will launch a new area on its own Web site, [www.rockfound.org](http://www.rockfound.org), to recruit and screen organizations seeking this subsidy to use the InnoCentive platform.

*Analysis:* Motivation is here merely based on external sources like money, visibility and fame. Like pointed by Wasko and Faraj (2000), tangible returns are probably more important than to socialising or developing personal relationships in such a community. However, the recent integration of Rockefeller Foundation with non-profit projects and related problem-solving makes collaboration more versatile and the Innocentive brand becomes “softer”. Similarly, the new user interface and services of InnoCentive will provide more opportunities for discussion and collaboration. Like described earlier by Hargadon and Sutton (1997) InnoCentive act as a broker and allows experts from many different field to combine their forces and expertise to solve problems.

*innerTee* (<http://www.innertee.com>)

This last example is a typical Web 2.0 service, currently in a beta phase. innerTee allows originators (artists) to create t-shirt designs and other users (mixers) to make re-designs of these original designs. Mixers can also sell their creations to others. In both cases, the originator (artist) gets a provision and earns respect and attention in the community. Like BookMooch this service is also based on points and these points can be consumed like money when making purchases in the service.

*Analysis:* innerTee has been purposively designed to support collaboration among designers and innovators.

The elements of Social influence model Bagozzi and Dholakia 2002, Dholakia *et al.* 2004) get realised in Innertee: *individual motives* for participation in the online community, *social influences* on member participation in the online community and *social identity* in the online community. From business perspective Innertee is similar to a service called Threadless.com: all designs are voted and only those designs that get enough votes will be manufactured. Design is outsourced to users and manufacturing of t-shirts is outsourced as well.

## 5. CONCLUSIONS

In this paper the authors have discussed about different perspectives considering how customers can be motivated to participate in innovation process. Since it has been stated that customers working collaboratively is the most efficient form, we focused on this rather unexplored area. Toolkits for community collaboration and their motivational factors were presented. We approached the phenomenon from both customers and companies' viewpoints using three Internet-based services as exemplars. These three cases (Bookmooch, Innocentive, innerTee) illustrated that a service can be both addictive to customers and profitable for companies. However, the earning logic and value creation models are different in each case, Bookmooch receives Amazon exchange fees everytime someone buys an Amazon book through Bookmooch user interface, Innocentive gets a percentive for every solved case and Innertee takes it's share of sold designs and mixes. What is similar to all of these cases, is that users act mostly without service provider firm interruption and even customise and maintain the service by themselves. Those collective creativity factors: help seeking, help giving, reflective reframing and reinforcing (Hargadon and Bechky, 2006) were only partially realised in those three cases. The role of brokers (Hargadon and Sutton, 1997, 2000) facilitating collective creativity and value creation was illustrated.

## 6. DISCUSSION

West and Gallagher (2006, 85) state that “motivating individuals to generate and contribute their IP in the absence of financial returns is a significant management challenge for an Open Innovation approach”. Open source software projects present a novel and successful alternative to conventional innovation models. This alternative presents interesting puzzles for and challenges to prevailing views regarding how innovations “should” be developed, and how organizations “should” form and operate. (von Hippel & von Krogh, 212, 2003). Fitzgerald (2006) discusses about OSS 2.0 and refers to new collaboration and business models between companies and open source communities. More research focus, according to our observations, should companies be put on the open source communities and their motivational factors to understanding. This is the direction where we will head next.

Here we can not avoid the concept called crowdsourcing (Surowiecki, 2004). Open source projects and some Web 2.0 services can be seen as a form of crowdsourcing. Crowdsourcing presumes that a large number of enthusiasts can outperform a small group of experienced professionals. When looking at most skilled people for crowdsourcing, there are generally four conditions that characterise wise crowds: 1) diversity of opinion (each person should have some private information, even if it’s just an eccentric interpretation of the known facts) 2) independence (people’s opinions are not determined by the opinions of those around them) 3) decentralization (people are able to specialise and draw on local knowledge) 4) aggregation (some mechanism exists for turning private judgements into a collective decision) (Surowiecki, 12, 2004). This definition “independence of opinion” by Surowiecki (2004) does not explain motivation to innovate collaboratively, nor mention the Interactive Value Creation defined by Reichwald & Piller (2006). In that sense the connections of collective creativity and crowdsourcing would be interesting to inspect more in detail.

After being familiar with customers’ motivations to participate and collaborate, the most challenging task for companies is to consider what kinds of templates and tools should be offered. This study acts as an opening for further studies considering customer collaboration. Therefore there are several interesting paths to go further. For example, exploring customers’ use of toolkits would be an interesting path to proceed. This would require usability analysis and better understanding of customer behaviour. Another question is, whether there are ethical problems, unexpected behaviour or limits in combined crowdsourcing and collective creativity like Thrift (2006) indicates. Crowds or communities may change their behaviour faster than companies expect. The third question is whether brokering phases by Hargadon and Sutton (1997, 2000) could be utilised to explain collective creativity of users in Web 2.0 services. Now brokering explains better the activities of companies providing those Web 2.0 collaboration platforms.

In overall, our case examples and our motivation study indicated that a mechanical bidding process in web communities is not enough to enable exchange of IP (intellectual property) for Open Innovation. The design of toolkits for community collaboration seems to require more research on motivational factors and collective creativity.

## REFERENCES

- Amabile, T. (1983). **The Social Psychology of Creativity**. Springer-Verlag: New York:
- Antikainen, M. (2007). **The attraction of company online communities**. A multiple case study. Academic dissertation. Department of Management Studies, University of Tampere, Finland.
- Bagozzi, R. P. and Dholakia, U. M. (2002). Intentional social action in consumer behaviour. *Journal of Interactive Marketing*, 16(2): 2-21.
- Bandura, A. (1995). *Self-efficacy in changing societies*. Cambridge: Cambridge University press.
- Beckhy, B. and Hargadon, A. (2006). When collections of creatives become creative collectives: A field study of problem solving at work. *Organization Science*, 17 (4): 484–500.
- Chesbrough, H.W. (2003). *Open Innovation: The New Imperative for Creating and Profiting from Technology*. Harvard Business School Press: Boston, MA.
- Chesbrough, H. (2006). Open Innovation: A Paradigm for Understanding Industrial Innovation. In Chesbrough, H., Vanhaverbeke, W., & West, J. (Eds.) *Open Innovation: Researching a New Paradigm*. 1-34. Oxford University Press: Oxford, UK.
- Gruen, T., Osmonbekov, T. and Czaplewski, A. (2005). *How e-communities extend the concept of exchange in marketing: An application of the motivation, opportunity, ability (MOA) theory*. *Marketing Theory*, 5 (1): 33-49.
- Davenport, T.H. and Beck, J.C. (2001). *The Attention Economy : Understanding the New Currency of Business*. Harvard Business School Press.
- Dholakia, U., Bagozzi, R. and Pearo, L. (2004). A social influence model of consumer participation in network- and small-group-based virtual communities. *International Journal of Research in Marketing*, 21 (3): 241-263.
- Farooq, U., Carroll, J., and Ganoë, C. (2005). Supporting Creativity in Distributed Scientific Communities. **Proceedings of the International GROUP Conference on Supporting Group Work** (Sanibel Island, Florida, November 6-9, 2005), 217-226. New York, USA: ACM Press.
- Fitzgerald, B. (2006). The Transformation of Open Source Software. *MIS Quarterly*, 30(3): 587-598.

Franke, N. and Piller, F. (2003). Key Research Issues in User Interaction with Configuration Toolkits in a Mass Customization System. *International Journal of Technology Management*, 26(5/6):578-599.

Hagel, J. and Armstrong, A. (1997). *Net gain: Expanding markets through virtual communities*. Boston: McKingsey & Company.

Hargadon, A. and Sutton, R. (2000) Building an Innovation Factory. *Harvard Business Review*. 78(3): 157-166.

Hargadon, A. & Bechky, B. (2006). When collections of Creatives Become Creative Collective – a Field Study of Problem Solving at Work. *Organization Science*, Vol. 17, No 4, 484-500.

Hargadon, A. & Sutton, R. (1997). Technology Brokering and Innovation in a Product Development Firm, *Administrative Science Quarterly*, Vol. 42, 716-749.

von Hippel, E. (2005). *Democratizing Innovation*. The MIT Press.

von Hippel, E. and von Krogh, G. (2003). Open source software and the ‘private-collective’ innovation model. *Organization Science* 14(2): 209-223.

Holmström, H. (2000). Getting to know your customers. Implications of virtual communities in on-line commerce. In L. Svensson, U. Snis et al. (Eds.), *Proceedings of IRIS 23 (Information Research in Scandinavia): Doing IT Together*. Uddevalla: University of Trollhättan.

Hutchins, E. (1991). Organizing work by adaptation. *Organization. Science*. 2(1): 14–39.

Klang, M. and Olsson, S. (1999). Commercialising online communities: From communities to commerce. In P. Leng and Grant et al. (Eds.), *Innovation through electronic commerce. Proceedings of the 2nd International Conference IeC'99*. Manchester, UK.

Kollock, P. (1999). The economies of online cooperation: Gifts and public goods in cyberspace. In M. Smith and P. Kollock (Eds), *Communities in cyberspace*. London: Routledge.

MacInnis, D., Moorman, C. and Jaworski, B. (1991). Enhancing and measuring consumers’ motivation, opportunity and ability to process brand information from Ads. *Journal of Marketing*, 55 (October): 32-53.

McKenna, K. and Bargh, J. (1999). Causes and consequences of social interaction on the Internet: A conceptual framework. *Media Psychology*, 1, 249-269.

McKenna, K. and Green, A. (2002). Virtual group dynamics. *Group dynamics: Theory, Research, and Practice*, 6 (1): 116-127.

- Meindl, J. R., Stubbart, C. and Porac, J.. (1996). *Cognition within and between organizations*. : Thousand Oaks, CA: Sage Publications.
- Pine, B.J. and Gilmore, J.H. (1999). *The Experience Economy: Work Is Theater & Every Business a Stage*. Harvard Business School Press.
- Reichwald, R., & Piller, F. (2006). *Interaktive Wertshöpfung*. Wiesbaden, Germany: Gabler.
- Rheingold, H. (2003). **Smart Mobs: The Next Social Revolution**. Basic Books.
- Ridings, C. and Gefen, D. (2004). Virtual community attraction: Why people hang out online. *Journal of Computer-Mediated-Communication*, 10 (1), Article 4.
- Skiba, B., Tamas, A. & Robinson, K. (2006) Web 2.0: Hype or Reality... and how will it play out? White paper. London.
- Sternberg, R. and Lubart, T. (1999). The concept of creativity: Prospects and paradigms. In R.J. Sternberg (Ed.), **Handbook of creativity**: 3-15. New York: Cambridge University Press.
- Surowiecki, J. (2005). **The Wisdom of Crowds**. Anchor.
- Thompson, L., Levine, J and Messick, D. 1999. *Shared cognition in organizations: The management of knowledge*. Lawrence Erlbaum Associates: Mahwah, NJ.
- Thrift, N. (2006). Re-inventing invention: new tendencies in capitalist commodification. *Economy and Society*, 35(2). 279-306.
- Tseng, M. & Piller, F. (2003) *The Customer Centric Enterprise: Advances in Mass Customization and Personalization*. New York: Springer.
- Wasko, M. and Faraj, S. (2000). It is what one does: why people participate and help others in electronic communities of practice. *Journal of Strategic Information Systems*, 9 (2-3): 155-173.
- West, J. & Gallagher, S. (2006) Open Innovation in Open Source Software . In Chesbrough, H., Vanhaverbeke, W., & West, J. (Eds.) *Open Innovation: Researching a New Paradigm*. 82-106. Oxford University Press: Oxford, UK.
- Weick, K. and Roberts, K.. (1993). Collective mind in organizations: Heedful interrelating on flight decks. *Administrative Science Quarterly*. 38(3): 357–381.
- Wikipedia.org (2007) Crowdsourcing - **wikipedia**, the free encyclopedia. Retrieved: 2nd Jan 2007 from [http://en.wikipedia.org/wiki/Web\\_2](http://en.wikipedia.org/wiki/Web_2).