



Social Networking Platforms as Creativity Fostering Systems: Research Model and Exploratory Study

Mario Schaarschmidt
Harald von Kortzfleisch

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Mario Schaarschmidt, Harald von Kortzfleisch
Institut für Informationsmanagement

Fachbereich Informatik

Universität Koblenz-Landau

Universitätsstraße 1

D-56070 Koblenz

E-Mail: mario.schaarschmidt@uni-koblenz.de; kortzfle@wiso-5.wiso.uni-koeln.de

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Mario Schaarschmidt

University of Koblenz-Landau, Germany

Harald von Kortzfleisch

University of Koblenz-Landau, Germany

Abstract

Social networking platforms are enabling users to create their own content, share this content with anyone they invite and organize connections with existing or new online contacts. Within these electronic environments users voluntarily add comments on virtual boards, distribute their search results or add information about their expertise areas to their social networking profiles and thereby share it with acquaintances, friends and increasingly even with colleagues in the corporate world. As a result, it is most likely that the underlying knowledge sharing processes result in many new and creative ideas. The objective of our research therefore is to understand if and how social social networking platforms can enforce creativity. In addition, we look at how these processes could be embedded within the organizational structures that influence innovative knowledge sharing behavior. The basis for our research is a framework which focuses on the relations between intrinsic motivation, creativity and social networking platforms. First results of our empirical investigation of a social software platform called “StudiVZ.net” proved that our two propositions are valid.

Introduction

Social networking platforms are often mentioned together with the Web 2.0 phenomenon. Web 2.0 suggests a technological leap by placing a version number and misleads insofar as it is in fact used to characterize a mixture of new internet technologies and changed usage behavior (Christopher 2007). In fact, it is questionable if a discrete version number is the right way to describe an ongoing process. However, whether you like the term or not, Web 2.0 is an accepted aggregation of several changes of how people use the Internet. In contrast to Web 1.0, which was all about defining and creating destinations for web users, Web 2.0 is about people and content (O’Reilly 2005). Users can simply generate content and

make it accessible for others. People can also host their own website, comment on articles or stay in touch with peers by using messaging tools. Overall, today users are no longer only consumers; increasingly they become also producers of what they consume, which is a very promising trend for marketing experts (see e.g. von Hippel 2005). In this context, Web 2.0 applications are mainly describing applications that are empowering users to create content, share this content with anyone they invite (or the whole world) and add new contacts to their virtual social network. A lot of people are therefore familiar with Web 2.0 applications, have built the trust and are comfortable bringing their private social software experience even into the corporate context.

On the other hand, firms are explicitly searching for knowledge and innovative ideas not only from inside but also from outside the corporate boundaries. Needed innovative knowledge is oftentimes not readily available in the organizational knowledge base and therefore companies use external sources to enlarge their internal knowledge base, i.e. they open-up their innovation processes (e.g. Chesbrough 2003, Laursen & Salter 2006, Lakhani et al. 2007). According to studies about open innovation processes, external sources like customers, suppliers, universities and even competitors are important factors for corporate innovation performance. However, with the use of Web 2.0 applications the strict distinction between outside and inside dissolves and becomes more or less obsolete. The corporate boundaries are becoming more permeable (Miller et al. 2007) due to the fact that many social software applications are accessible to people from outside a corporation which results in an ongoing process of merging the employees' corporate worlds with their private lives. Through using instant messaging tools for example, employees can be contacted by colleagues as well as by friends or else related persons (Heim 1999) and the contact lists of social networking platforms therefore include peers from the private environment as well as colleagues and business partners.

To sum up, although serious research has been done on how internet technologies can deepen the relationship between creative customers and companies and therefore lead to the co-creation of innovative products and processes (see in

general von Hippel 2005, Sawhney et al. 2005, Piller & Walcher 2006, Sleeswijk Visser et al. 2007, and especially Kivimäki et al. 2000 (communication as determinant), Scott & Bruce 1994, Amabile et al. 1996, Dewett 2007 (intrinsic motivation as determinant) Kossinets & Watts 2006 (technology as determinant)), still little is known about the emergence of creativity through the usage of social software applications.

The objective of our article is therefore to investigate if and how Web 2.0 applications (here social networking platforms) – as a gate to both, internal and external sources – can enable the creation of innovative ideas. Our research design is highly exploratory in the sense that we use a relative small sample for our empirical investigation as well as new measures.

In the following we will first give a short overview on Web 2.0 applications. Secondly, we will discuss the relationships between intrinsic motivation, creativity and social software applications on an organizational level which lead to our research framework and two related propositions. Thirdly, we present first results of an empirical study investigating user behavior and their perceived creativity by using the social networking platform “StudiVZ.net”. Our findings are only a first step to prove our propositions and therefore only an indicator rather than evidence. As we said, the investigation is highly explorative in nature, but even to that early point the results are showing the legitimacy for further research in this unexplored area.

Social Networking Platforms

Social software application is a widely used term which includes blogs, wikis and instant messaging tools as well as social networking platforms (Lee 2006, Szugat et al. 2006, Von Kortzfleisch et al. 2007). The latter foster the design and maintenance of private and corporate relationships on the Internet. Most famous are, besides MySpace, Orkut or Friendster, platforms to support the networking for professional aims like Xing, LinkedIn, aSmallWorld, or content specific aims like StudiVZ, facebook or wer-kennt-wen. Users can administrate their contacts, win

new contacts and establish a social network of friends, colleagues or (potential) business partners depending on the platform type (Wasko & Faraj 2005, Hippner & Wilde 2006). Moreover, in contrast to content-driven communities (Xing for business contacts, facebook.com for students) new content-agnostic platforms like wer-kennt-wen appear with the aim to reach people of all age and interests just because of the platform itself, disregarding people's specific tendencies. These virtual communities profit from increased reachability. Therefore, new social networks could occur, which never could be built in real life due to regional distance or problems in identifying and maintaining relationships (Cyganski & Hass 2007). In addition, social networking platforms have to be divided into two types according to their underlying business model. On the one side, there are open systems, where people can subscribe without any restrictions and can interact with mates immediately. On the other side, there are more closed systems which require an invitation from other users, a confirmation by the provider or the user simply has to pay a fee. In both cases the platform operator wants to establish a high level of platform usage to generate the required revenue (Kollmann & Stöckmann 2007). Every type of the above mentioned social software applications is in a specific way linked to the defining criteria of Web 2.0: user generated content and/or user-driven interactivity. Therefore, the following literature review on creativity and Web 2.0 is general in nature, but leads to the objective of our investigation, the networking portal StudiVz.net, which is called to be a copy of the American platform Facebook (www.facebook.com) and addresses first and foremost German speaking students.

Idea Generation in Social Networks

Intrinsic Motivation and Creativity

Research about creativity is mainly focused on organizational settings and has shown that intrinsic motivation is positive related to employee creativity (Amabile 1985, Amabile & Gryskiewicz 1989, Tierney et al. 1999, Ryan & Deci 2000, Dewett 2007). Typically, these studies concentrated on employees in a traditional

R&D environment, i.e. embedded in a hierarchical organizational structure. On the contrary, with Web 2.0 applications finding their way into the corporate world (simply through employees who are using social software in their private lives) new opportunities for knowledge creation and sharing are bubbling up – in that case uncontrolled and undirected by the top management. In particular, when people are bringing their experiences with Web 2.0 applications into the corporate context they virtually introduce self-organizing behavior instead of hierarchical structures.

Looking at research on social software applications, intrinsic motivation is also a determinant in case of voluntary engagement in knowledge sharing and idea generation in the Web 2.0 context. Although people can benefit from extrinsic incentives by freely revealing their information (Harhoff et al. 2003), most studies dealing with motives for participating on Web 2.0 platforms point to intrinsic motivation as the core driver. Most evidence could be derived from observations of general knowledge sharing behavior (Remedios & Boreham 2004, Wasko & Faraj 2005) and within open source software (OSS) development settings (Shah 2006, Wu et al. 2007, Bitzer et al. 2007). The latter all agree on intrinsic motivation as the main reason to participate in OSS development projects. An exception is provided by Roberts et al. (2006) who highlight intrinsic motivation as being only one important out of several other factors.

To sum up, intrinsic motivation which is known as positive related to employee creativity – at least in a traditional organizational environment – is therefore supposed to enforce creativity even more in a non-hierarchical, i.e. self-organizing user-centric knowledge and content generating structure like a Web 2.0 environment. Still, the impact of Web 2.0 applications on creative behavior is unexplored (see figure 1).

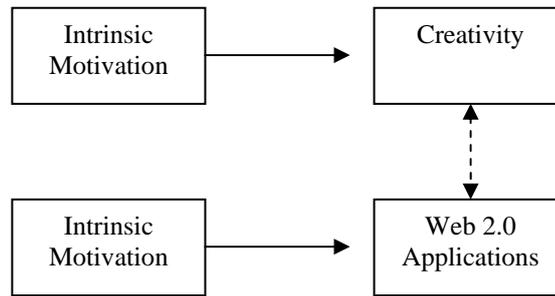


Figure 1: The relation between intrinsic motivation, creativity and Web 2.0 applications. The continuous arrows represent well explored interactions; the dashed arrow refers to unexplored territory.

Therefore, in a first step the present exploratory study was designed to explicitly ask for perceived creativity and potentially enabled creative thinking in social software application environments. Since intrinsic motivation is most likely positive related to creativity in Web 2.0 applications and additionally traditional organizational parameters like “autonomy” become obsolete in self-organizing settings, the content itself becomes the driving factor for creativity and well-explored measures for organizational settings are not suitable anymore. The related proposition with regard to the driving parameter for creativity in social software applications is stated as follows (see also figure 2):

P1: The more users perceive the content of social networking platforms as being creative, the merrier they are motivated to start thinking about creative ideas themselves (creative content drives creative behavior).

Web 2.0 Implications on Creativity and Innovation

Creativity is mostly defined as the production of novel and useful ideas, processes, or products by a person or group (e.g. Woodman et al. 1993, Oldham & Cummings 1996) whereas innovation is related to the adoption of ideas and idea implementation (van de Ven 1986). Therefore, creativity can be seen as the starting point for innovations (van Dijk & van den Ende 2002, Cropley 2006). Both, the creative process and the innovation process are often described as stage-based processes (see Parnes 1992, Tassoul & Buijs 2007 and Tidd et al. 2005, Crawford

& di Benedetto 2005, respectively). Following this perspective, idea generation is only one stage of a multistage process (Scott & Bruce 1994).

Looking at the creative process only, further research has shown that each phase can be divided into a divergent and a convergent part (Parnes 1992, Tassoul & Buijs 2007). During a divergent phase, one is thinking about a great number of alternatives concerning the problem, the criteria or implementation. In a second and convergent phase of evaluating and selecting alternatives the number of ideas is decreasing. Furthermore, passing the stages an individual “seeks sponsorship for an idea and attempts to build a coalition of supporters for it” (Scott & Bruce 1994, p.582). However, building a coalition needs communication which is called to be a determinant of organizational innovation (Kivimäki et al. 2000). From a firm’s point of view both, external and internal communication are important for the innovative performance (see Chebrough 2003), but it is also empirically explored that interaction predicts innovativeness less strongly than collaboration (Kahn 1996). Web 2.0, which is about communication per se, points in a lesser degree to collaboration because it is rather used to share social content than to actually work together. Again, the term Web 2.0 is not clearly defined and some applications are designed and used to collaborate as well, but more often and especially in the case of studiVz.net, Web 2.0 is just about user interaction which overall leads to our second proposition (see also figure 2):

P2: The intensity to interactively deal with Web 2.0 applications has no significant impact on the creative outcome (social interactivity does not drive creative behavior).

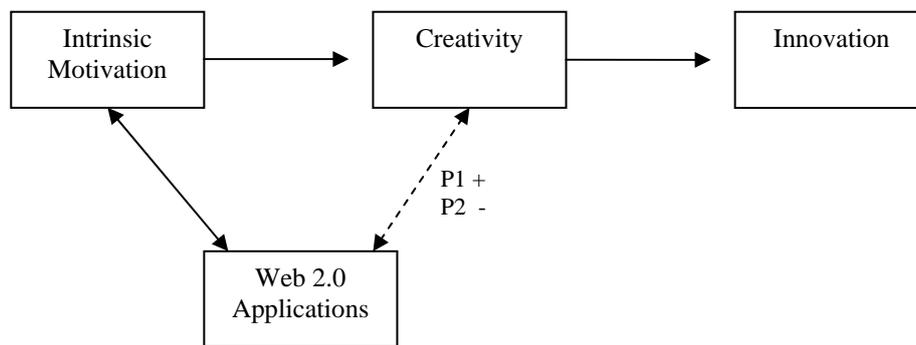


Figure 2: The conceptual framework. The continuous arrows represent well explored interactions; the dashed arrow refers to unexplored territory.

In reference to the two basic propositions, we see the following study as a first exploratory step to answer the question if Web 2.0 applications can enhance creativity and innovation. In principle, in order to explore the impact of social software applications on innovative knowledge sharing and idea generation, the respective application systems described further above need to be analyzed separately. There are too many differences between the systems with regard to the degree of interactivity, average response time, and user effort, for example. In the following empirical study we focus on and examine the usage of a social networking platform and its impact on creativity because these platforms typically offer the highest degree of potential interactivity and related (potentially creative) knowledge sharing in comparison with other Web 2.0 applications so far.

Empirical Results

Objective of investigation

Given the fact that intrinsic motivation and collaboration are important determinants for creativity, this exploratory study only concentrates on creative behavior and interactivity. To be specifically clear, in this first step our focus is not to show any direct relation between intrinsic motivation and creativity in a Web 2.0 environment. Rather, in reference to our propositions the goal is to examine how

the usage of a specific Web 2.0 application is impacting people's creativity on a broader level. Therefore we are not measuring intrinsic motivation in our investigation.

The starting point for this research was the German social networking platform StudiVz (www.studivz.net). StudiVz is called to be a copy of the American networking platform Facebook (www.facebook.com). Students sign-up to this platform by using their email address and a password. Logged on, they can work on their profile by editing their pictures, their addresses, their subjects, their interests and even their relationship status. According to the operator's statement, more than 9 million people are currently enrolled¹. Due to the success of this platform and the limited abilities to control every single profile and its origin, the participants are not only students anymore and the platform is open to all types of users. Furthermore, more than six billion page impressions and 390 million visits in June 2008 (IVW Online 2008) make StudiVz to be one of the most visited web sites in the German-speaking Internet.

Presently, mainly one feature is grabbing user's attention: The joining and creation of groups. The group concept was originally designed to create a place where people can discuss about topics of interests. However, more often belonging to a group becomes a personal statement. Therefore, the size of a group varies between one and more than 10.000 members, where group communication becomes nearly impossible. In addition, members are able to see the group memberships of their friends and other members (depending on security settings). Thus, a group membership has moved from a discussion room to an additional way to express someone's personality, which enlarges the overall profile, e.g. by designing group names like "We drink alcohol only on days of the week that end with day" or "I am pushing the remote control buttons even harder when the batteries are low". As everybody is free to create his or her own group, the number of groups and the number of memberships are constantly rising. In the present study the perception of groups and group names respectively is functioning as an indicator for creativity.

¹ The number includes the subpages schuelerVz and meinVz, which are both run under the studiVz umbrella. See http://www.studivz.net/1/about_us/1 for further details

Method

An online survey with members of StudiVz was conducted. To ensure that only members will take part in the survey we invited the participants via the StudiVz messaging system and sent them an URL link. Moreover, we asked the invitees to send the link to two or three mates via the platform message system only. Overall, we received 65 responses to the questionnaire. Due to the snowball effect (members forwarded the link to the survey to other members) it is not possible to announce a response rate. However, it is worth noting that the deviation of our sample is pretty close to a reference statistic of studiVz users from December 2006 in terms of average age, completed fields or number of group memberships.

Previous research on creativity and innovation has focused on patent data and patent citation (Argyres & Silverman 2004, Laursen & Salter 2006, Miller et al. 2007) or on perceived innovative behavior in organizations (Siegel & Kaemmerer 1978, Scott & Bruce 1994, Kivimäki et al. 2000, Dewett 2007) as an indicator of innovation or creativity. The analysis of patent data delivers feasible insights for technological or industrial R&D environments. It is to a lesser extent transferable to other areas such as software development or as an indicator for creativity in non-R&D-environments and therefore not suitable for our research design. Furthermore, due to missing command structures in case of voluntarily knowledge sharing, platform using or idea generation, some variables from prior research known to be proved measures for creativity in a R&D environment like “supervisor encouragement” or “autonomy” (see Scott & Bruce 1994, Amabile et al. 1996, Zhou & George 2001, Zhou & Shalley 2003, Janssen 2005) are not applicable any more to measure creativity in a Web 2.0 environment. Therefore, along with our propositions we developed the following specific parameters:

Usage

‘Usage’ refers to how frequent people use StudiVz. Usage in this case mirrors communication because the more often people use the application the more frequent they interact with other members. Users were asked how frequent they use

StudiVz, which is ranked on a 5-Likert-type scale ranged from 1, “rare” to 5, “minimum once a day”.

Perceived Creativity

‘Perceived creativity’ measures how people think about the creativeness of the content. Again, most items that could be found in the literature refer to hierarchical organizational settings (Scott & Bruce 1994, George & Zhou 2001, Dewett 2007). Therefore, only three items were used: “The group names listed on my friends profile are creative”, “The personal statements of my friends are creative” and “The favourite quotes of my friends are creative”. Coefficient α for this scale was 0.72.

Creative Thinking

The variable ‘Creative Thinking’ was measured by asking if people start to think about new themes while they are dealing with StudiVz. In contrast to other studies (e.g. Amabile 1996), this variable is our main indicator for creativity and includes the item “Creative group names initiate me to think about a foundation of an own group”. Therefore, this measure goes beyond the ex-post reflection which is provided by ‘Perceived Creativity’ and delivers insights if people feel enforced to be creative.

Control variable

We included gender as a control variable because former studies are pointing to an influence of gender specific differences on creative ability (Conti et al. 2001).

Results and Discussion

Discriptive results

Table 1 displays the descriptive statistics and correlations for each of the variables described in the previous section. ‘Creative Thinking’ is correlated to ‘Usage’ and ‘Perceived Creativity’ (0.26 and 0.34, respectively) which indicates that both are determinants related to creativity. In contrast to previous studies (e.g. Conti et al. 2001) the control variable ‘Gender’ has no significant correlation to ‘Perceived Creativity’ or to ‘Creative Thinking’.

Table 1: Means, standard deviations and correlations

Variable	Mean	SD	1	2	3	4
1. Gender	1.52	0.50	-			
2. Usage	4.52	0.73	0.14	-		
3. Perceived Creativity	1.91	1.09	- 0.05	0.05	-	
4. Creative Thinking	2.51	1.31	- 0.05	0.26*	0.35**	-

N=65

*p<0.05; **p<0.01

To test our propositions we conducted a regression analysis whose results can be seen in table 2. In the first model, where ‘Perceived Creativity’ is the dependant variable the intensity of usage did not significantly influence the user’s perception of creative content supporting proposition number 2. The second Model shows that perceived creativity significantly influenced creative thinking ($\beta=0.344$, $p<0.01$), which supports proposition number 1.

Table 2: Regression analysis

Variables	Model 1: DV=Perceived Creativity	Model 2: DV=Creative Thinking
Control variable		
Gender	-0.048	-0.008
Independent variables		
Usage	0.031	0.170
Perceived Creativity		0.344**
R ²	0.04	0.15*
ΔR^2	0.02	0.11*

N=65

*p<0.05; **p<0.01

The results of this exploratory study make at least one contribution: Even if the intensity of usage of social software applications has no significant impact on neither perceived creativity nor creative thinking (what was already predicted by

several other studies if one interprets intensity of usage as communication; see Kahn 1996, Kivimäki et al. 2000), perceived creativity itself can significantly influence creative thinking. The two supported propositions are therefore supporting our assumption that Web 2.0 applications are able to function as a proxy for creativity or as a creativity enforcing medium. If this holds true for social networking platforms like StudiVz it might also be the case for other social networking platforms as well as other types of Web 2.0 applications like instant messaging tools or blogs and even corporate social software applications. Obviously, answers to these questions can only be the result of further research.

Regarding companies, Web 2.0 applications contribute to the process of permeating corporate boundaries because they are accessible for people from inside and outside a corporation. Our findings assume, if companies want to make use of Web 2.0 users' experiences, ideas and creativity they have to take into account that employees' expectations are driven by their private use of social software applications. Therefore, companies have to generate (virtual) rooms which enable employees to satisfy their wish to interact as they are used to. In addition, requirements on organizational culture and climate are very important for creativity and innovation (Amabile et al. 1996, van Dijk & van den Ende 2002, Martins & Terblanche 2003, Fagan 2004). A culture of trust in which employees are willing to participate and do not have to fear negative consequences of their social networking activities is a *conditio sine qua non*. Not to fear negative consequences leads to an increased willingness to take risks and to expose innovative ideas as an integral to employee creativity (Amabile et al. 1996, Zhou & George 2001, Dewett 2007), - what is given in a non-hierarchical Web 2.0 environment.

Finally, research findings on creativity are varying considerably depending on the type of creativity indicator used (Oldham & Cummings 1996). For example, referring to "objective" supervisor ratings of employee creativity differs from measuring perceived ("subjective") creativity (Dewett 2007). Our measure of "starting to think creatively" is not well explored and is therefore only a first indicator for creative content production. Furthermore, the results are not feasible

to predict creativity in Web 2.0 environments in general but they show that there is a hidden creative potential which needs to be explored in further research.

References

- Amabile T.M. (1985): *Motivation and creativity: effects of motivational orientation on creative writers*. In: Journal of Personality and Social Psychology, Vol.48, p.393-399.
- Amabile T.M. and Gyskiewicz N.D. (1989): *The creative environment scales: work environment inventory*. In: Creativity Research Journal, Vol.2, p.231-253.
- Amabile T.M., Conti R., Coon H., Lazenby J. and Herron M. (1996): *Assessing the work environment for creativity*. In: Academy of Management Journal, Vol.39, p.1154-1184.
- Argyres N.S. and Silverman B.S. (2004): *R&D, organization structure, and the development of corporate technological knowledge*. In: Strategic Management Journal, Vol.25, p.929-958.
- Bitzer J., Schrettl W. and Schröder P.J.H. (2007): *Intrinsic motivation in open source software development*. In: Journal of Comparative Economics, Vol.35, p.160-169.
- Chesbrough H. (2003): *Open innovation*. Harvard University Press, Cambridge, Mass.
- Christopher L.C. (2007): *Understanding Web 2.0*. In: The Seybold Report, Vol.7, No.11, p.7-8.
- Conti R., Collins M.A. and Picariello (2001): *The impact of competition on intrinsic motivation and creativity: considering gender, gender segregation, and gender role orientation*. In: Personality and Individual Differences, Vol.30, p.1273-1289.
- Crawford M. and di Benedetto A. (2005): *New products management*. 8th ed., McGraw-Hill, New York.
- Cropley D.H. (2006): *The role of creativity as a driver of innovation*. In: IEEE International Conference on Management of Technology and Innovation Proceedings, Vol.2, p.561-565.
- Cyganski P. and Hass B. (2007): *Potenziale sozialer Netzwerke in Unternehmen [trans.: Potentials of Social Networks for Companies]*. In: Hass, B.; Walsh, G. and Kilian T. (eds.): Web 2.0: Neue Perspektiven für Marketing und Medien [trans.: New Perspectives in Marketing and Media], Springer, Berlin.
- Dewett T. (2007): *Linking intrinsic motivation, risk taking, and employee creativity in an R&D environment*. In: R&D Management, Vol.37, No.3, p.197-208.
- Fagan M.H. (2004): *The Influence of creative style and climate on software development team creativity: an exploratory study*. In: Journal of Computer Information Systems, Vol.44, No.3, p.73-80.
- George J.M. and Zhou J. (2001): *When openness to experience and conscientiousness are related to creative behavior: an interactional approach*. In: Journal of Applied Psychology, Vol.86, p.513-524.
- Hansen M.T., Nohira N., Tierney T. (1999): *What's your strategy for managing knowledge?* In: Harvard Business Review, March-April, p.106-116.
- Hansen M.T. (2002): *Knowledge networks: explaining effective knowledge sharing in multiunit companies*. In: Organization Studies, Vol.13, p.222-248.
- Harhoff D., Henkel J. and von Hippel E. (2003): *Profiting from voluntary information spillovers: how users benefit by freely revealing their innovations*. In: Research Policy, Vol.32, p.1753-1769.

- Heim J. (1999): *Use ICQ to stay in touch with colleagues, Friends*. In: PC World, Vol.17, No.7, p.244-246.
- Hippner H. and Wilde T. (2006): *Social Software*. In: Wirtschaftsinformatik 47, p.441-444.
- IVW Online (2008): IVW Informationsgemeinschaft zur Feststellung der Verbreitung von Werbeträgern e.V. URL, <http://www.ivw.eu>.
- Janssen O. (2005): *The joint impact of perceived influence and supervisor supportiveness on employee innovative behaviour*. In: Journal of Occupational and Organizational Psychology, Vol.78, p.573-579.
- Kahn K.K. (1996): *Interdepartmental integration: a definition with implications for product development performance*. In: Journal of Product Innovation Management, Vol.7, p.137-151.
- Kivimäki M et al. (2000): *Communication as a determinant of organizational innovation*. In: R&D Management, Vol.30, No.1, p.33-42.
- Kollmann T. and Stöckmann C. (2007): *Diffusion von Web 2.0 Plattformen*. In: Hass, B.; Walsh, G. and Kilian T. (eds.): Web 2.0: Neue Perspektiven für Marketing und Medien [trans. New Perspectives in Marketing and Media], Springer, Berlin.
- Kossinets G. and Watts D.J. (2006): *Empirical analysis of an evolving social network*. In: Science, Vol.311, p.88-90.
- Kratzer J., Leenders R.T. and van Engelen J.M.L (2004): *Stimulating the potential: Creative performance and communication in innovation teams*. In: Creativity and Innovation Management, Vol.13, No.1, p.63-71.
- Lakhani K.R., Jeppesen L.B., Lohse P.A. and Panetta J.A. (2007): *The value of openness in scientific problem solving*. Harvard Business School Working Paper No. 07-050.
- Laursen K. and Salter A. (2006): *Open for innovation: the role of openness in explaining innovation performance among U.K. Manufacturing Firms*. In: Strategic Management Journal, Vol.27, p.131-150.
- Lee S., Hwang T. and Lee H.-H. (2006): *Corporate blogging strategies of the Fortune 500 companies*. In: Management Decision, Vol.44, No.3, p.316-334.
- Martins E.C. and Terblanche F. (2003): *Building organizational culture that stimulates creativity and innovation*. In: European Journal of Innovation Management, Vol.6, No.1, p.64-74.
- Miller D.J., Fern M.J. and Cardinal L.B. (2007): *The use of knowledge for technological innovation within diversified firms*. In: Academy of Management Journal, Vol.50, No.2, p.308-326.
- Oldham G.R. and Cummings A. (1996): *Employee creativity: personal and contextual factors at work*. In: The Academy of Management Journal, Vol.39, No.3, p.607-634.
- O'Reilly T. (2005): *What is Web 2.0? Design patterns and business models for the next generation of software*. In: O'Reilly Network, 2005/09/30. <http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.htm>
- Parnes S.J. (1992): *Source book for creative problem solving*. The Creative Education Foundation Press. Buffalo, NY.
- Piller F.T. and Walcher D. (2006): *Toolkits for idea competitions: a novel method to integrate users in new product development*. In: R&D Management, Vol.36, No.3, p.307-318.
- Remedios R. and Boreham N. (2004): *Organizational learning and employees' intrinsic motivation*. In: Journal of Education and Work, Vol.17, No.2, p.219-235.
- Roberts J.A., Hann I.-H. and Slaughter S.A. (2006): *Understanding the motives, participation, and performance of open source software developers: a longitudinal study of the apache projects*. In: Management Science, Vol.52, No.7, p.984-999.

- Ryan R.M. and Deci E.L. (2000): *Intrinsic and extrinsic motivations: classic definitions and new directions*. In: Contemporary Educational Psychology, Vol.25, p.54-67.
- Sawhney M, Verona G. and Prandelli E. (2005): *Collaborating to create: the internet as a platform for customer engagement in product innovation*. In: Journal of Interactive Marketing, Vol.19, No.4, p.4-17.
- Scott S.G. and Bruce R.A. (1994): *Determinants of innovative behaviour: a path model of individual innovation in the workplace*. In: Academy of Management Journal, Vol.37, No.3, p.580-607.
- Shah S.K. (2006): *Motivation, governance, and the viability of hybrid forms in open source software development*. In: Management Science, Vol.52, No.7, p.1000-1014.
- Siegel S. and Kaemmerer W. (1978): *Measuring the perceived support for innovation in organizations*. In: Journal of Applied Psychology, Vol.63, p.553-562.
- Sleeswijk Visser F., van der Lugt R. and Stappers J.P. (2007): *Sharing user experiences in the product innovation process: Participatory design needs participatory communication*. In: Journal of Creativity and Innovation, Vol.16, No.1, p.35-45.
- Szugat M., Gewehr J.E. and Lochmann C. (2006): *Social Software – Blogs, Wiki's & Co.* entwickler.press Verlag, Frankfurt/M.
- Tassoul M. and Buijs J. (2007): *Clustering: An essential step from diverging to converging*. In: Creativity and Innovation Management Vol.16, No.1, p.16-26.
- Tidd J., Bessant J. and Pavitt K. (2005): *Managing innovation*. John Wiley & Sons, 3rd ed., New York.
- Tierney P., Farmer S.M. and Graen G.B. (1999): *An examination of leadership and employee creativity: the relevance of traits and relationships*. In: Personnel Psychology, Vol.52, p.591-620.
- Van de Ven A. (1986): *Central problems in the management of innovation*. In: Management Science, Vol.32, p.590-607.
- Van Dijk C. and van den Ende, J. (2002): *Suggestion systems: transferring employee creativity into practicable ideas*. In: R&D Management, Vol.32, No.5, p.387-395.
- Von Hippel E. (2005): *Democratizing innovation*. MIT Press, Cambridge, Mass.
- Von Kortzfleisch, H.; Mergel, I.; Manouchehri, S. and Schaarschmidt, M. (2007): *Corporate Web 2.0 Applications: Motives, Organizational Embeddedness, and Creativity*. In: Hass, B.; Walsh, G. and Kilian T. (eds.): Web 2.0: Neue Perspektiven für Marketing und Medien [trans. New Perspectives in Marketing and Media], Springer, Berlin.
- Wasko M.M. and Faraj S. (2005): *Why should I share? Examining social software and knowledge contribution in electronic networks of practice*. In: MIS Quarterly, Vol.29, p.35-57.
- Woodman R.W., Sawyer J.E. and Griffin R.W. (1993): *Toward a theory of organizational creativity*. In: Academy of Management Review, Vol.18, No.2, p.293-321.
- Wu C.-G., Gerlach J.H. and Young C.E. (2007): *An empirical analysis of open source software developers' motivations and continuance intentions*. In: Information & Management, Vol.44, p.253-262.
- Zhou J. and George J.M. (2001): *When job dissatisfaction leads to creativity: encouraging the expression of voice*. In: Academy of Management Journal, Vol.44, No.4, p.682-696.
- Zhou J. and Shalley C.E. (2003): *Research on employee creativity: a critical review and directions for future research*. In: Martocchio J. and Ferris G.R. (eds), Research in Personnel and Human Resource Management, Vol.22, Greenwich, CT: JAI Press Inc., p.165-217.

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