2009

FROM IDEA MANAGEMENT SYSTEMS TO INTERACTIVE INNOVATION MANAGEMENT SYSTEMS: DESIGNING FOR INTERACTION AND KNOWLEDGE EXCHANGE

Bastian Bansemir
Friedrich-Alexander-Universität Erlangen-Nürnberg

Anne-Katrin Neyer
Friedrich-Alexander-Universität Erlangen-Nürnberg

FROM IDEA MANAGEMENT SYSTEMS TO INTERACTIVE INNOVATION MANAGEMENT SYSTEMS:
DESIGNING FOR INTERACTION AND KNOWLEDGE EXCHANGE

Bastian Bansemir, Anne-Katrin Neyer[1]

Abstract

Idea management systems are increasingly widespread in organizations. With their deployment, firms get aware that existing systems have various shortcomings. By analysing idea management systems in three German service firms, we find that a low degree of interaction and knowledge exchange lead to a high workload particular for idea developers and submission of too many ideas. In addition, these ideas are of low maturity and submitted multiple times. To overcome these shortcomings our analysis reveals that firms need an interactive innovation management system that supports multidisciplinarity and team collaboration and includes different social software applications.

1. Introduction

Even though firms see innovation as the most important way to survive (e.g. [3]: 7; [9]: 417), the pressure to efficiently design innovative products and services is omnipresent. Consequently, firms are forced to find and implement new concepts and methods to make the innovation process more efficient. One strategically used instrument to profit from the innovative power of employees is the implementation of idea management systems. Ekvall [8] defines idea management systems as "an administrative procedure for collection, judging and compensating ideas, which are conceived by employees of the organization." These systems are considered to work as a catalyst for the innovative spirit within organizations [11]. From an IT-perspective, we can identify several tools that are particular designed to foster idea creation on platforms. For instance platforms like WebStorm by Brightidea, Idea Central by Imaginatik and CogniStreamer by Indie Group support idea creation by integrating important social software applications, which foster the management of information, communication, coordination and cooperation on hyper textual social networks (e.g. [17]: 38; [15]). Nevertheless, even though these tools are available and firms invest considerable resources in idea management systems, the output in terms of radical innovations is still limited [23]. The design of existing idea management system quite often encourages incremental rather

---

[1] Friedrich-Alexander-Universität Erlangen-Nürnberg, Lehrstuhl für Wirtschaftsinformatik I, Germany

than radical innovations. One reason for this may be that existing idea management systems are not primarily designed to foster the interactive development of ideas among employees. However, it is widely accepted that an organization's ability to innovate is closely related to the use of collective expertise and expert knowledge from diverse functional background [21]. Thus, we argue that there is a need to elaborate a) the role of interactions and knowledge exchange among employees in idea management systems and b) how these systems need to be adapted to become more interactive.

By applying a comparative case study approach, we investigate the key issues of existing idea management systems towards the consideration of interaction and knowledge exchange. To deal with these challenges, we come up with the requirements of an interactive innovation management system. We define *interactive innovation management systems* as easy-to-use IT-instruments, which enable organizations to identify, develop, prioritize and value employee-derived innovations. Within the innovation creation, development and selection stage in the innovation process these systems give employees the freedom to innovate and develop their ideas via iterative and interactive trial and error processes. Employees create and iteratively improve ideas towards innovations, discuss main influences and finally present their innovation. Thereby the knowledge exchange and interactive development of innovations across the boundaries of business units need to be fostered. To move towards such interactive innovation management systems, we aim to identify the IT-requirements of firms, which are in the transition of moving from idea management systems towards interactive innovation management systems.

2. Theoretical perspective

In order to integrate employees in the innovation process, firms use suggestion systems or idea management systems [23]. But these systems seem not to fulfil their task sufficiently. As Gamlin et al. [10]: 13 state the "idea management system … is little more than a suggestion box". But simply capturing ideas of innovative products and services is not enough to encourage employees' involvement in such systems. As it is widely accepted that an organization's ability to innovate is closely related to the use of collective expertise and knowledge, interaction and knowledge exchange within and across group's boundaries is an increasingly important challenge for organizations that want to move towards interactive innovation management systems. In practice, however, interaction and knowledge exchange within and across various organizational boundaries for the sake of innovation has proven to be difficult [2]; [22]. We use the concepts of interaction and knowledge exchange as one way examining in greater depth how an interactive innovation management system needs to be designed to encourage the submission of ideas across multiple types of boundaries. We focus on interaction and knowledge exchange, as knowledge management theory underlines the importance of social relations in understanding knowledge creation, retention, and exchange [1]. Research on cooperation illustrates that the search and acquisition of knowledge is most effective in terms of innovation when the individual knowledge is networked, shared, and channelled through cooperation and relationships between the involved individuals ([21]: 459).

Researchers focusing on the relational approach of interaction and knowledge sharing have mainly studied the characteristics of established relations that support or hinder interaction and exchange of knowledge within the organization. Building on this stream of literature, we identify three antecedents that influence the design of interactive innovation management systems:

First, established *collaborative behaviour* may be associated with an organization's absorptive capacity [6], i.e. the ability of an organization to access, value, and utilize new knowledge to innovation purposes. We argue that in organizations with a high degree of collaborative behaviour, the willingness to develop and share ideas via interactive innovation management systems is high. In this case, individuals are assumed to be more willing to trust that their ideas and knowledge will be valued by others if shared through interactive innovation management systems.

Second, the creation of a *shared mental model* is facilitated through interaction and knowledge exchange. Shared mental models are socially constructed cognitive structures that represent shared knowledge or beliefs about an environment and its expected behaviour and improve coordination by enabling members to anticipate one another´s actions and needs [5]. In order to successfully use interactive innovation management systems, individuals need to create shared mental models of their ideas and their knowledge background. Interactive innovation management systems that provide individuals with the possibility to create a shared understanding of their ideas, and thus, allow them to further develop their ideas, are assumed to encourage individuals to use these systems as an approach to develop and exchange innovative ideas.

Third, groups that have a high degree of collaborative behaviour may have a better understanding and awareness of each other's knowledge in the form of a *transactive memory system* [1]; [18]. This understanding of "who knows what" within the group may help members to exchange their knowledge effectively among each other. Consequently, interactive innovation management systems need to provide individuals with the possibility to figure out, who the experts in a field are, so that they can turn to them to get support for the further development of their idea.

Previous research in the field of idea management systems shows that most of the existing idea management systems do not explicitly consider the interaction and knowledge exchange aspect [23]. However, given the importance of interaction and knowledge exchange stressed by the relational approach, we argue that there is a need to better understand if and, if so, how idea management systems can be transformed towards an interactive innovation management system. This leads us to our research questions to be tested in the context of firms, which are in the transition towards interactive innovation management systems. *What are the current shortcomings of existing idea management systems with regard to interaction and knowledge exchange? How do idea management systems need to be designed to incorporate interaction and knowledge exchange aspects and thus, move towards an interactive innovation management system? Which IT-requirements do these firms have for the design of an interactive innovation management system?*

3. Research approach

3.1. Sample and data collection

In our study we focused on firms that are in the transition of moving from an idea management system to an interactive innovation management system. As we were asking the firms to share with us their experience and potential shortcomings of existing idea management systems, it was important to have a trustworthy relationship with them. Thus, we decided to do our study in three firms in the service sector, with which we have a longstanding and excellent relationship. This setting allowed us to gain deep insights into the shortcomings of existing systems (with which a lot of firms are confronted today) and the requirements for interactive innovation management systems. The analyzed three firms in the service sector are comparable in terms of number of employees and have a similar stream of revenue. The idea management systems of these three firms had been in use for at least two years. Also, the firms want to move towards a more interactive innovation management system.

Over a period of two months, ten in-depth interviews, using a semi-structured interview guideline, were conducted with innovation managers, strategy, HR, and R&D leaders in each of the firms. The semi-structured interview guideline included questions aiming at understanding the existing idea management systems, in particular, the enablers and barriers towards the use of it. Then, we asked for the requirements to overcome the shortcomings of existing idea management systems with a move towards interactive innovation management systems. Finally, we have included a set of questions dealing with the role of social software applications in interactive innovation management

systems as well as potential social software applications identified to be important for interactive innovation management systems. Interviews lasted from one to two hours. Each interview was recorded on tape and transcribed.

3.2. Data analysis

The transcripts and notes of the interviews of our three in-depth case studies were analyzed, following typical content analysis procedures to code data (e.g., [14]; [16]; [13]). Corresponding to our research questions we have split the analysis in three parts: The first part represents the major issues regarding idea management systems in use. The second part identifies important aspects of how idea management systems should be designed to consider interaction and knowledge sharing and thus move towards interactive innovation management systems. The third part emphasizes five potential social software applications, identified by our interview partners that need to be integrated in interactive innovation management systems.

If data collected from the various sources were inconsistent or contradictory, we went back to the interviewee to clarify issues and compared the findings with existing literature. All data were coded independently by two parties and then compared, using a process of analyst triangulation [24].

4. Results

4.1. Idea management systems: Current shortcomings

Our data reveal that a high workload during the development of innovative ideas as well as the submission of too many ideas are major issues deriving from a lack of interaction and knowledge exchange in existing idea management systems.

All cases face the challenge of a high *workload* during the development of innovative ideas. A closer look into the process of the development of innovative ideas reveals that the workload is mostly related to two challenges. First, interviewees find the development of innovative ideas for a single individual to be *time consuming*. Given the fact that most employees are already busy in getting their 'normal job' done, our interviews show that if an individual does not have the support of others, innovative ideas will be dropped because of a lack in time to work on the idea. Closely related to this is our finding that *needed specialized knowledge* for developing the idea further is mostly not at hand and often exceeds the "bounded rationality" of a single employee [19]; [20]; [12]. From a theoretical view, the efficient establishment of a transactive memory system through idea management systems is a key challenge to integrate specialized knowledge. Currently used idea management systems do not support this, as interviewees state that good ideas are dropped as too much time would have been needed to gain the specialized knowledge to develop the idea further. Also, we find that if employees realize that they will not be able to acquire the needed knowledge, they drop their ideas.

The idea management systems under observation do not support idea developers in sharing the workload with interested third parties or in the search for experts. If employees want to exchange their ideas with other employees, they have to search for other employees willing and capable of helping in the special issue by themselves. This search for motivated experts is time consuming and inefficient.

Besides the workload, the *submission of too many ideas* is an issue in all three cases. The studied idea management systems are designed in a way that all ideas are reviewed by at least two reviewers and feedback is given to the idea submitter within a short period of time (mostly two weeks). Resources are provided for this process. For illustration, in one of the studied firms over one thousand ideas have been submitted in 2007, whereas only around 15 % have been adopted

later on. One of our interviewees emphasizes that this means that 85 % of all work done in the reviewing process is a waste of resources (in terms of working time) and, thus is costly.

This major concern in the existing idea management system can be explained by a low degree of interaction and knowledge exchange while engaging in the use of these systems. Even though all ideas are visible for every employee, same or similar rejected ideas are *submitted several times*. For instance, it was proposed to provide an innovative service support for different operating systems (e.g. windows and linux) in one firm. But this idea had been rejected before because of technical reasons. Thus, reviewing this idea a second and third time was redundant. Strongly related to this is, that the *level of maturity* of ideas submitted is often not high enough. Therefore, good ideas are rejected because the idea is not well enough developed.

4.2. Towards interactive innovation management systems: Designing for interaction and knowledge exchange

In order to overcome current challenges of idea management systems, we now turn to a detailed analysis of requirements for interactive innovation management systems, identified by our interview partners. In overall, analysis reveals that, multidisciplinarity and team collaboration are preconditions to foster interaction and knowledge exchange in the interactive innovation management systems.

In our interviews, *multidisciplinarity* is identified as a major requirement for interactive innovation management systems, aiming to overcome the lack of specialized knowledge and the submission of too many ideas. Interactive innovation management systems that are designed towards valuing and encouraging multidisciplinarity address the integration of specialized knowledge in order to overcome the "bounded rationality" of individuals and to support the establishment of a transactive memory system. Multidisciplinarity through interaction among business units' boarders is assumed to enhance the probability of developing *discontinuous ideas*. Interviewees state that they know from successfully generated discontinuous innovations, that these innovations are mainly created by bringing together experts from different educational and functional backgrounds. Also, the *level of maturity* of ideas can be increased. By interacting with individuals from different backgrounds, the ideas go through several learning loops. While redesigning and refining ideas iteratively, the level of maturity increases. As a consequence, one could argue that only those ideas that have a high innovative potential are put in the system. Thus, time and resources for the review and evaluation processes can be reduced.

In a similar vein, *team collaboration* is identified as a major requirement for interactive innovation management systems for two main reasons: First, the possibility to *share work load* among each other while developing an idea, is described to be important. Especially broad ideas can be broken down in smaller work packages and team members can work on them separately. It was pointed out that distributing workload among several employees reduces immoderate work load of a single employee. Second, team collaboration has an important impact on the *motivational aspects* of individuals to engage in interactive innovation management systems. Our interviewees assume that most people prefer to work in teams and to get social exchange, and thus, developing ideas in teams is assumed to be more motivating than working on them alone.

This focus on multidisciplinarity and team collaboration for interactive innovation management systems is in line with previous research in the field of innovation management. For instance, Subramaniam and Youndt [21] show that the development of innovative ideas is most efficient when the individual knowledge from different background is networked, shared, and channelled through cooperation and relationships between the involved individuals.

4.3. Towards interactive innovation management systems: Enabling interaction and knowledge exchange by integrating social software applications

Building on their experience, our interview partners identify five well-known social software applications as important tools for interactive innovation management systems: social networks, social search engines, instant messaging, wikis and weblogs [4]. In general, our interviews lead to the conclusion that it is important to consider already existing social software application in other domains of the firm (for instance, instant messaging) in the interactive innovation management systems.

Social networks expressed and visualized through social software applications are assumed to provide members of the organization with information about their co-workers. This allows for the creation of a better understanding and awareness of dispersed knowledge within the organization. Our interviewees state that the understanding of "who knows what" within the organization supports the establishment of trust among employees and, thus, fosters the willingness to openly exchange ideas on the interactive innovation management system. To deal with the issue of 'not knowing whom to contact to further develop an idea', *social search engines* are identified in the studied firms as tools to find and get in contact with experts in different fields by providing individual profiles, similar to the platform "Xing". One step further, interviewees mentioned that *instant messaging* can support communication across various boundaries of a firm, which supports individuals to develop a joint understanding of ideas. Our interview partners assume that this will reduce the number of the same ideas submitted several times. Getting aware and in contact with the 'others', who are using the interactive innovation management systems, is a first step to develop a shared understanding among the users of the systems. Also, it can help to increase collaborative behaviour as individuals have the feeling to know each other better. Again, interviewees emphasize that this will encourage employees to trust each other, and thus, fostering interaction and knowledge exchange. In order to develop and share a common knowledge base, our interviewees suggest *weblogs*, which can be used as a documentation of expertise. They assume that such tools allow employees to find information to further develop their ideas and, thus, may increase the level of maturity of the idea before submission. In a similar vein, *wikis and weblogs* are identified to increase knowledge networking and knowledge exchange among employees. Included editing functions of wikis help to enrich presented knowledge on the idea management system, which, in turn, is assumed to have a positive impact on the level of maturity of submitted ideas. A fast and easy discussion, exchange and development of potential ideas through the use of weblogs - already in the beginning of idea development - may help to overcome the issue of submitting the same ideas several times. Our interviewees argue that by sharing ideas with others, individuals are able to get a good understanding of whether their ideas are innovative or how they could develop their ideas further to ensure a significant difference from already submitted ideas. Accessing, editing, discussing and using knowledge presented at a wiki or weblog is identified as an important factor to enhance collaborative behaviour among idea developers on an interactive innovation management system.

Table 1 summarizes the findings of our analysis. It combines the identified shortcomings in terms of interaction and knowledge exchange of existing idea management systems and the requirements for interactive innovation management systems with our theoretical arguments. Also, it presents potential social software applications identified by the interview partners as tools to support multidisciplinarity and team collaboration.

Shortcomings of idea management systems	Theoretical aspect based on a relational view on interaction and knowledge exchange	Requirements of interactive innovation management systems	Potential social software applications identified by firms in transition
Workload (needed time for idea development, need for specialized knowledge)	Low transactive memory system	Multidisciplinarity (discontinuousness of ideas, level of maturity)	Wikis, weblogs, social networks, social search engines
Submission of too many ideas (repeated idea submission, level of maturity)	Low collaborative behaviour, low transactive memory system, lack of shared mental models	Team collaboration (share of work load, motivational aspects)	Instant messaging, wikis, weblogs

Table 1: Summary of findings

5. Discussion

This study expands ongoing discussions on how to move from idea management systems to interactive innovation management systems. Building on the relational aspect of interaction and knowledge exchange literature, we have analyzed the major shortcomings of existing idea management systems as well as requirements for interactive innovation management systems. Our results have theoretical and practical implications in the domain of how firms that already have an idea management system can move towards an interactive innovation management system.

First, our case study data show that the high extent of workload that is needed to come up with a highly innovative idea and the issue of the submission of too many ideas can be overcome if interaction and knowledge exchange is fostered by the idea management systems. To do so, firms that are in the transition of moving towards interactive innovation management systems have identified multidisciplinarity and team collaboration to be crucial. Collaborative behaviour, shared mental models and transactive memory systems are important antecedents to deal with the issues in existing idea management systems and have to be considered when designing interactive innovation management systems. This interactive perspective leads to important challenges, such as how to deal with power relationships and its influence on the idea selection and development. Further research should study in more detail how systems such as interactive innovation management systems determine who is integrated and important in the innovation process.

Whereas our study focuses on the interaction level of idea management systems, previous research underlines the influence of organizational aspects on the engagement in idea management systems [23]. Thus, from a theoretical point of view, it would be interesting to gain a deeper understanding of the relation of moving towards an interactive innovation management systems and the contextual setting in which the system is embedded. For instance, one could argue that an interactive innovation management system will not work, if the organizational context in which it is implemented is not supporting interaction and knowledge exchange among employees.

In a second domain, our research has implications for the integration of social software applications in interactive innovation management systems in those firms that are in the transition from already existing idea management system towards interactive innovation management systems. As one needs to consider that those firms do not implement an interactive innovation management system from the scratch, our analysis reveals that those firms seem to prefer to integrate tools that are (at least up to a certain degree) already used in the firms. Thus, our findings lead to the assumption that

firms, which are in the transition from an idea to an interactive innovation management system, experience a need to balance between the utilization of existing social software applications and the implementation of new systems, such as WebStorm, Idea Central and CogniStreamer.

The strengths of our study must be tempered with recognition of its limitations. The sample of studied idea management systems was relatively small, which is a common trade-off in qualitative research. The method used was appropriate, since our aim was to capture depth of understanding rather than breadth at this explorative phase. Also, in case study research generalisation is gained in terms of generalizing findings to theory rather than to a large population [7]; [24]. A related limitation is that our sample does not offer an exhaustive variety of organisations.

These limitations aside, our study contributes to a better understanding of the current shortcomings of existing idea management systems and requirements for interactive innovation management systems. It comes up with preliminary implications on how to design interactive innovation management systems from both, the relational aspect of the interaction and knowledge exchange theory and the technical requirements identified by the studied firms. Our research, thus, can help both, firms and researchers to overcome shortcomings of existing idea management systems and support the transition towards interactive innovation management systems.

Acknowledgements

References

[1]   ARGOTE, L., McEVILY, B. and REAGANS, R., Managing knowledge in organizations: Creating, retaining and transferring knowledge, in: Management Science, 49 (2003), 4: v-viii.

[2]   ARGOTE, L., INGRAM, P., LEVINE, J. and MORELAND, R., Knowledge transfer in organizations, in: Organ. Behavior Human Decision Processes, 82 (2000), 1: 1-8.

[3]   BESSANT, J. and TIDD, J., Innovation and entrepreneurship, John Wiley & Sons, Chichester 2007.

[4]   BOULOS, M. N. K., WHEELERT, S., The emerging Web 2.0 social software: an enabling suite of sociable technologies in health and health care education, in: Health Information and Libraries Journal, 24 (2007), 2-23.

[5]   CANNON-BOWERS, J. A., SALAS, E. and CONVERSE, S., Shared mental models in expert team decision making, in: N. J. CASTELLAN, Individual and group decision making, Lawrence Erlbaum Associates, Hillsdale 1993, 221-246.

[6]   COHEN, W. and LEVINTHAL, D., Absorptive capacity: A new perspective on learning and innovation, in: Administrative Science Quarterly, 35 (1990), 128-152.

[7]   EISENHARDT, K. M., Building theories from case study research, in: Academy of Management Review, 14 (1989), 4: 532-550.

[8]   EKVALL, G., Creativity at the Place of Work, Reklamlito, Stockholm 1971.

[9]   FLYNN, M., DOOLEY, L., O'SULLIVAN, D. and CORMICAN, K., Idea management for organizational innovation, in: International Journal of Innovation Management. 7 (2003), 4: 417-442.

[10] GAMLIN, J. N., YOURD, R. and PATRICK, V., Unlock Creativity with "Acitve" Idea Management, in: Research-Technology Management, 50 (2007), 1: 13-16.

[11] HAMEL, G., Leading the revolution, Harvard Business Press 2000.

[12] MARCH, J. G., Bounded rationality, ambiguity, and the engineering of choice, in: Bell Journal of Economics, 9 (1978), 2: 587-608.

[13] MAYRING, P., Qualitative Content Analysis – Research Instrument or Mode of Interpretation?, in: M. KIEGELMANN, The Role of the Researcher in Qualitative Psychology, Tübingen 2002, 139-148.

[14] MILES, M. B. and HUBERMAN, A. M., Qualitative data analysis: an expanded sourcebook, Second Edition, Sage, Thousand Oaks 1994.

[15] RICHTER, A. and KOCH, M., Enterprise 2.0: Planung, Einführung und erfolgreicher Einsatz von Social Software in Unternehmen, Oldenbourg, München 2007.

[16] RYAN, G. W. and BERNHARD, R. H., Data management and analysis methods, in: N. K. DENZIN and Y. S. LINCOLN, Handbook of qualitative research, Second Edition, Sage, Thousand Oaks 2000, 796-802.

[17] SCHMIDT, J, Social Software: Onlinegestütztes Informations-, Identitäts- und Beziehungsmanagement, in: Forschungsjournal Neue Soziale Bewegungen, 18 (2006), 2: 37-46.

[18] SCHULZ, M., Pathways of relevance: Exploring inflow of knowledge into subunits of multinational corporations, in: Organization Science, 14 (2003), 440-459.

[19] SIMON, H., Administrative Behaviour, NY: Macmillan, New York 1957.

[20] SIMON, H., Models of Bounded Rationality, MIT Press, Cambridge 1982.

[21] SUBRAMANIAM, M. and YOUNDT, M. A., The influence of intellectual capital on the type of innovative capabilities, in: Academy of Management Journal, 48 (2005), 3: 450-463.

[22] SZULANSKI, G., Exploring internal stickiness: Impediments of the transfer of best practice within the firm, in: Strategic Management Journal, 17 (1996), 27-43.

[23] VAN DIJK, C. and VAN DEN ENDE, J., Suggestion systems: transferring employee creativity into practicable ideas, in: R&D Management. 32 (2002), 2: 387-395.

[24] YIN, R. K., Case study research: Design and methods, Third edition, Sage, Thousand Oaks 2003.