Association for Information Systems
AIS Electronic Library (AISeL)

2006

Community mirrors for supporting corporate innovation and motivation

Michael Koch
Technische Universitat Munchen, kochm@in.tum.de

Kathrin M. Möslein
HHL - Leipzig Graduate School of Management Center for Leading Innovation & Cooperation (CLIC),
kathrin.moeslein@hhl.de

Follow this and additional works at: http://aisel.aisnet.org/ecis2006

COMMUNITY MIRRORS FOR SUPPORTING CORPORATE INNOVATION AND MOTIVATION

Koch, Michael, Technische Universität München, Fakultät für Informatik, Boltzmannstr. 3, D-85748 Garching, Germany, kochm@in.tum.de

Möslein, Kathrin, HHL – Leipzig Graduate School of Management, Jahnallee 59, D-04109 Leipzig, Germany, kathrin.moeslein@hhl.de

Abstract

In this paper we are exploring the idea of applying community support concepts and ubiquitous user interfaces to supporting the motivation to innovate in corporate settings. Our special focus is on the early phase of the innovation process – the phase of idea generation and suggestion management. The key idea is to provide awareness for a company's creative potential and appreciation for the idea creators in a corporate setting by displaying information from community platforms handling the suggestion management process on public shared displays ("Idea Mirrors") in the office space.

1   INTRODUCTION

Starting from early studies in the domain of computer-supported cooperative work, community support is becoming more and more important in the enterprise. The most relevant application area in this context is knowledge management where community support platforms help so-called "communities of practice" to efficiently communicate, exchange information, or find experts (see for example Wenger 1998). However, when looking into current community support applications in corporations one can see that particular support still is focused on clearly structured or artefact-based domains. There is only little support for unstructured domains like creativity, motivation, leadership and innovation.

In this paper we are exploring the idea of applying community support concepts and ubiquitous user interfaces to *supporting the motivation to innovate in corporate settings* with a special focus on the early phase of the innovation process – the phase of idea generation and suggestion management. The key idea is to provide awareness for a company's creative potential and appreciation for the idea creators in a corporate setting using ubiquitous user interfaces.

We are following a systems engineering approach, and have currently finished the requirements engineering and a rough design. Section 2 of this paper provides a brief introduction into community support and community awareness. Section 3 then reviews the domain of idea generation in corporate innovation systems and the role of motivation for the overall innovation performance. Awareness and appreciation are identified as the key levers for the motivation to innovate. Section 4 elaborates on how the idea of displaying information from community support platforms in the work environment can be applied to improve the motivation to innovate by supporting awareness and appreciation. Building on earlier experiences with a range of prototypes, Section 5 presents how to use these public shared displays to develop "Idea Mirrors" as corporate support platforms for the motivation to innovate. And finally, Section 6 provides some first conclusions and presents the next steps we are planning to take.

2 COMMUNITY SUPPORT AND COMMUNITY AWARENESS

2.1 Communities and Community Support

In general a community is a group of people who share some interest, identify with a common idea or share some work practice (see for example Hillery 1955, Mynatt et al. 1997). Recent characterizations of the concept further highlight the need for mutual collaboration in the community, e.g. the will to exchange knowledge or to help each other (Ishida 1998, Wenger 1998). According to this discussion a community should not just be seen as a set of people who have something in common and who have the possibility to communicate, but as a set of people who are willing to help each other, who are collaborating to the advantage of all. Because of this, communities and community support have become a core concept in most modern knowledge management efforts.

Besides the collaboration among the members, the main activities in communities are communication and finding people to communicate with. Hence, community support can be described as "*communication and matchmaking support*". Correspondingly, the functionalities of computer-based community support tools can be summarized by the following two basic support concepts:

Providing a medium for direct communication and for indirect exchange of content and comments within the common scope of the community.

Providing awareness of other members and helping to discover relationships (medium for matchmaking). This can help to find possible cooperation partners for direct interaction (see for example related work on expertise management, Becks et al. 2004, Zhang and Ackermann 2005).

The task of supporting employees of a company to innovate, to share ideas about innovation can be addressed as a community support task.

2.2 Common Ground and Community Awareness

One important issue in community support is the support of informal communication as a basis for establishing common ground that is necessary for meaningful conversations and relationships. Common ground, as Clark defines it in his book "Using Language" (Clark 1996), is information that two parties share and are aware that they share. According to Clark,

> "*Everything we do is rooted in information we have about our surroundings, activities, perceptions, emotions, plans, interests. Everything we do jointly with others is also rooted in this information, but only in that part we think they share with us.*".

Closely related to common ground is the concept of awareness, which has already been researched intensively in the collaboration support domain. Dourish and Belotti define awareness as "*an understanding of the activities of others, which provides a context for your own activities*" (Dourish and Belotti 1992). Context for the own activities can be different types of information, ranging from information about the availability of co-workers to notifications about people or information that might be relevant to your own work or leisure activities. Schlichter et al. regard providing awareness as the most common dominator in collaboration support (Schlichter et al. 1998). They list contact facilitation and collaborative usage of knowledge as the main activities in communities to be supported by awareness. While groupware focuses on workspace awareness, community support focuses on people/presence awareness (due to the lack of a common workspace).

Common ground and awareness suggest that providing a detailed and aggregated view of a community can help community members in their activities. The value of awareness can be seen in lowering coordination costs (by enabling implicit coordination) and in communities especially in supporting different forms of intrinsic motivation – so, the motivation of some people relies on the possibility to be seen, about the transparency that their contribution is seen and recognized.

As we will detail later, this idea of providing community awareness, of making information about ideas available in a easy consumable way, will be of particular interest for supporting idea exchange in corporate innovation.

3 CORPORATE INNOVATION AND MOTIVATION

A company's innovative capability and performance builds on the creativity and motivation of its customers, employees, and partners to generate ideas for the improvement of products, processes and structures and on the company's ability to integrate a broad base of innovative input into the corporate innovation system. Most creative acts are unexpected. Therein lies a company's creative potential. A company can be seen as creative when its employees do something new and possibly useful without being directly shown or taught.

Corporate innovation management aims at improving and enhancing the transformation process of ideas (i.e. inventions) into marketable products and services (i.e. innovations). In most organizations a broad range of instruments, mechanisms and overall systems are in place to support this fundamental process, and they are by no means restricted to the realm of corporate research and development. It is a key issue of corporate innovation management to capture the ideas of as many employees, customers or corporate partners as possible to feed an organizations innovation pipeline.

Figure 1 shows the so-called "Penthalon Model" of the overall innovation process (see Goffin and Pfeiffer 1999; Oke and Goffin 2001). The key message of the framework is that being good in one area is not enough. Just like in a Pentathlon, good performance in all five areas is more important than exceptional performance in one area (Oke and Goffin 2001; Munshi et al. 2005). The middle portion of the framework consists of the classic process or pipeline for carrying out or developing an innovation. This includes the process of generating, selecting and developing ideas into commercially viable new products and services.
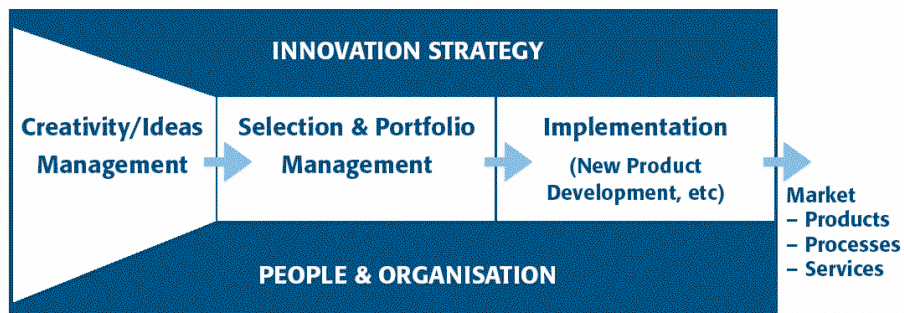

Figure 1:   *The "Penthalon Model" of Corporate Innovation Management (Goffin and Pfeiffer, 1999; Oke and Goffin, 2001)*

While it is obvious that the quality of the innovation output depends highly on the creativity and quality of the idea input, most support concepts and systems still focus on the later process stages of idea selection / portfolio management and implementation. The early phase of creativity and idea generation is mainly supported by suggestion systems. These suggestion systems are not a recent concept. The first such system was implemented by the British Navy in 1770 and NCR is seen as the first US company to implement a corporate suggestion system in 1892 (Robinson and Stern 1997). Since WWII most companies have implemented physical and virtual suggestion boxes to collect the ideas of employees across the organization and to capture input from their customers for the innovation process. While the processes of idea capturing have changed a lot since the early days, the key challenge seems to remain relatively constant: it is the bottleneck of suggestion management in the early stages of the innovation pipeline where the idea generator remains relatively isolated from

the overall process, often receives not even feedback and over time looses the motivation to contribute his/her input to the system.

Companies like Imaginatik (www.imaginatik.com) have developed idea management processes and tools for supporting these processes. Their core product "Idea Central" supports collecting ideas from employees, and contains the full functionality of the idea management process, such as idea collection, idea development, evaluation, idea browsing and search. However, still the problem remains of how to generate the necessary awareness for the ideas created and how to recognize those who created them.

Many solutions to this problem have been discussed, implemented and many have failed, especially in the internal suggestion system processes. They usually build upon the concept of rewards in exchange for the contribution of ideas into the system. Monetary and non-monetary incentive systems have been built into suggestion systems to avoid frustration. Still, however, corporate cynicism often equals suggestion boxes to trash bins, as the bottleneck effect of corporate suggestion management can hardly be avoided. As a consequence, the corporate suggestion pipeline often runs dry.

How to build rewards into corporate innovation systems, is not a trivial issue. Often monetary and non-monetary incentive schemes are integrated into corporate incentive systems with best intentions, and nevertheless as a result we may see less, instead of more motivation to innovate.

> *"Much creativity is the result of informal poking around, experimenting and exploiting the unexpected. In the race for the reward, not only is creativity sacrificed, but opportunities for what cognitive psychologists call 'incidental learning', the important knowledge and insight gained from such exploration, are greatly reduced.*
>
> *We do not mean to suggest that those involved in creative acts should receive no rewards whatsoever. It is of course important for people to be recognized and treated fairly"* *(Robinson and Stern 1997, p. 55).*

Motivation research is well aware of the related psychological and social processes: It contrasts (1) intrinsic, (2) extrinsic and (3) social forms of human motivation based on whether the motivation stems from (1) the task and work content itself, from (2) external monetary and non-monetary rewards or (3) the social context of personal networks and social relationships (Deci 1971, 1975; Deci and Ryan 1985; Frey and Oberholzer-Gee 1997; Amabile 1993). Motivation research explains how extrinsic motivation and especially monetary incentives may destroy intrinsic motivation (the so-called "crowding-out effect") by triggering purely reward-oriented behaviour (Deci, 1971; Amabile 1987; Robinson and Stern 1997; Frey and Jegen 2000) and it argues that a lack of social context and personal appreciation is a key source for low levels of human motivation and personal engagement (Osterloh and Frost 2000; Gottschalg 2004).

These findings of motivation research are up to now only rudimentarily reflected in corporate idea management and suggestion systems. Overall, we can say that the focus is on the classical duo of intrinsic and extrinsic motivation where often extrinsic rewards crush intrinsic motivation. And even systems that successfully overcome the "crowding-out effect" of human motivation, usually show no consideration of the "social glue" that drives individual motivation in corporate contexts. These deficits with respect to social motivation, for us, seem to be the key source of frustration that can usually be observed as a main barrier to the realization of a company's creative potential.

In this paper we set the focus on social motivation and explore how community mirrors may support awareness for and appreciation of individual contributions as the key drivers of personal engagement and commitment.

4   COMMUNITY MIRRORS

In the previous section we have motivated the core importance of awareness and appreciation for fostering individual idea generation in corporate innovation systems. This leads us to the main idea of

our project: *supporting awareness of contributed ideas to support the idea management process and to support motivation contributing to company improvements*.

The core of the solution is to visualize the creative potential of individual idea creators in a corporate context at the locus of corporate decision making, i.e. to bring the ideas in the awareness space of a company's decision makers. We are proposing to do this by using ubiquitous user interfaces in the work space of the decision makers to display the awareness information. More precisely, we propose to replace or add to the artwork that regularly covers company walls in corporate headquarters with dynamic awareness displays. Visualizing ideas in an aesthetic and artful design via public shared displays should allow to create awareness for a company's creative potential in the headquarters and to provide appreciation for the idea creators in a company's shop floors and decentralized departments.

4.1 Public Shared Displays for building Community Mirrors

The availability and modality of access to the community support application can be considered a major issue. Ubiquitous Computing and mobile computing, i.e. new user interfaces that are emerged in the real world, may address the boundaries of community support and offer possibilities for enlarging the reach of community support applications.

This idea might be especially useful in the area of awareness support, i.e. visualizing the activity in the community, the relationships and interactions among the community members, and presenting this information at locations and in situations where the community members meet. The reason for this is, that awareness information usually is not seeked deliberately, but profits a lot from being displayed and consumed peripherally.

Such awareness applications for communities ("Community Mirrors") provide information about the community and its activities for community members to support interaction and matchmaking in the community. Community Mirrors are built using large interactive screens or projections of the information in enterprise information systems / community platforms into the public space, where the users are working.

4.2 Community Mirror Prototypes and related work

Public shared large screen user interfaces are not a new concept, having been pioneered in the 1970's by Myron Krueger (1991). Recent work has mainly focused on supporting collaboration between co-located or distributed users (e.g. DynaWall, Geissler 1998).

However, there are also several approaches that follow similar ideas as we have presented before, e.g. the Plasma Poster from Fuji Xerox Palo Alto Laboratory (Churchill et al. 2003, 2004) or the CWall from Xerox Research Lab Europe (Snowdon and Grasso 2002).

The main problem with the existing large screen applications is that they usually are self-contained, and do not interface with other (community support) applications. In our groups we therefore have developed first prototypes of Community Mirrors that specifically address the integration issue: the Library Mirror, the Meeting Mirror, and the Announcement Mirror (Koch 2004, 2005). The experience in developing these prototypes brought us to reason about the "idea mirror" application.

5 THE IDEA MIRROR

The result of the discussion in the previous sections is the concept of an "Idea Mirror", a large screen Community Mirror application that helps to motivate for innovation by providing awareness for ideas and suggestions and appreciation for the idea creators in a corporate setting. In this section we are going to describe the rough design of this particular application. Thereby, we rely on the characteristics of the application domain as described in the previous sections, and on the experiences we had with earlier prototypes.

The first issue is that the large screen application of the Idea Mirror does not have to cover the whole idea generation and reviewing process. As with the other applications we assume that there are desktop or Web based applications for entering ideas and for reviewing them or for accessing detailed information on ideas. This can be professional applications with built-in workflow like Idea Central from Imaginatik or a simple Web-based database solution. The Idea Mirror uses the information in this central system to provide

> awareness of the ideas that have been submitted and to allow easy access to a short overview of the ideas (e.g. a link into the Web based solution) and
>
> appreciation for the idea creators and to allow easy access to contact them (e.g. a link to a Web based people profile).

As we have learned from earlier prototypes in other application domains the core issue of making the application work is to provide an appealing display that draws attention to it. The prototype application tries to accomplish this with the following measures:

> Ideas are represented by portrait of idea submitter and a catchy title (slogan) of the idea on a small file card only.
>
> The title is presented in a large font – which makes space for about four to five ideas on the screen at one time only.
>
> To display all ideas, idea representations are moving from the outside of the screen into the screen in an animated way, stay there for a while, and then move to the outside again.
>
> The background color of the screen is gradually changing.

Interaction with the Idea Mirror should be simple, too. By touching an idea file card the card is extended to most of the screen showing all the information available about the idea – i.e. an abstract, some meta information about the classification of the idea, and contact information (whom to contact or where to look for more information). Additionally, the users can access a menu for selecting ideas by meta information for being displayed. This is triggered by touching a special area of the screen with large question marks on it. Then a menu appears that shows the different idea categories (see meta information) and all values available for the categories. By selection one or more values and touching the "Search" button, the search window disappears and the requested ideas are displayed.

For achieving the goal of making corporate decision makers aware of their company's creative potential and to provide the necessary appreciation for a company's idea creators, we propose to install Idea Mirrors at central semi-public places – especially in corporate headquarters - where managers pass by or even better where they stay for meetings and breaks.

We assume that the main way of using the application is to glimpse some keywords in peripheral attention and then (eventually but not necessarily) access more information. By installing the display at semi-public places where often groups of people can be seen, we enable immediate discussion of ideas in the groups (we saw such behaviour with all other applications discussed before). The installation should be seen as animated pieces of art – that is why they are designed in a professional design and animated way. One positive side effect of this is that the installations often can be budgeted to the budget for artwork and not to information technology.

There has been discussion if we should adapt the displayed information to the location where the Idea Mirror is installed. E.g. showing only ideas about engineering on a mirror installed in engineering. This however also could have the negative side effect that ideas cannot spread. So, we implemented a possibility to display mainly ideas about one domain, but sneak in randomly ideas about other domains too.

6   CONCLUSION

Companies depend on a steady stream of creative ideas that lead to new or improved products and services. Surprisingly, evidence shows that current implementations of the innovation process still fail to provide adequate motivation and awareness.

In this paper we have explored the idea of applying community support concepts and ubiquitous user interfaces to support the motivation to innovate in corporate settings. Our special focus is on the early phase of the innovation process – the phase of idea generation and suggestion management. The key idea is to increase motivation for innovators and adaptors by providing awareness for a company's creative potential and appreciation for the idea creators in a corporate setting ("in the real world").

This is achieved by taking information about submitted ideas from the (Web-based) corporate innovation community platform, and displaying this information in a semi-public space on so-called Community Mirrors. Building on earlier experiences with a range of Community Mirror prototypes, we suggested "Idea Mirrors" as additional interfaces to corporate innovation platforms.

The challenges with introducing such new interfaces to information systems are both in technology integration (linking the new user interfaces and the Web-based information systems) and in socio-political acceptance and resulting behaviour. We did not deeply study the latter issue, but our experience with other Community Mirror applications showed that providing the interface in the natural interaction space of the potential users (as "artwork" on the walls of semi-public spaces) greatly widens the scope of such a system. And this is key in spreading ideas and motivating people to contribute ideas to the corporate systems.

After the requirements engineering and concept creation (rough design) phases our next steps in the project are evaluating the ideas with functional prototypes and live data and finally applying the concept to a live setting. For the first step (functional prototypes and live data) we have started building the application and have acquired data from the Adidas Virtual Customer Lab, a platform for consumers of running and football shoes in Germany, Austria and Switzerland. This purely Web-based platform is part of the overall Adidas-Customer-Project and, among others, provided possibilities for customers to deliver input on the level of idea generation (Reichwald, Piller and Walcher 2005). This demonstrator with the Adidas data will help us to streamline the user interface and to continue to a live real world evaluation environment.

References

Amabile, T.M. (1987): The Motivation to be Creative. In: Isaksen, S.G. (Ed.): Frontiers of Creativity Research, Bearly Press: Buffalo NY 1987, pp. 229-230.

Amabile, T.M. (1993): Motivational Synergy: Toward New Conceptualizations of Intrinsic and Extrinsic Motivation in the Workplace. Human Resource Management Review, 3(3): pp. 185ff.

Becks, A.; Reichling, T. and Wulf, V. (2004): Expertise Finding: Approaches to Foster Social Capital. Social Capital and Information Technology. Huysman, M. and Wulf, V. Cambridge, MA, MIT Press: pp. 333-354.

Churchill, E.; Nelson, L. and Denoue, L. (2003): Multimedia Flyers – Informal Information Sharing with Digital Community Bulletin Boards. In: Proc. Communities and Technologies, Amsterdam, Kluwer Publishers.

Churchill, E.; Girgensohn, A.; Nelson, L. and Lee, A. (2004): Blending Digital and Physical Spaces for Ubiquitous Community Participation. Communication of the ACM, Feb. 2004, 47 (2), pp. 39-44.

Clark, H. H. (1996): Using Language, Cambridge University Press.

Deci, E.L. (1971): Effects of Externally Mediated Rewards on Intrinsic Motivation, in: Journal of Personality and Social Psychology, Vol. 18, 1971, pp. 114ff.

Deci, E.L. (1975): Intrinsic motivation. New York and London: Plenum Press.

Deci, E.L. and Ryan, R.M. (1985): Intrinsic motivation and self-determination in human behavior. New York: Plenum Press.

Dourish, P. and Belotti, V. (1992): Awareness and Coordination in Shared Workspaces. In: Proc. of the Conf. on Computer-Supported Cooperative Work, pp. 107-114.

Frey, B.S. and Jegen, R. (2000): Motivation Crowding Theory: A Survey of Empirical Evidence. CESifo Working Paper Series CESifo Working Paper No. 26.

Frey, B.S. and Oberholzer-Gee, F. (1997): The cost of price incentives: An empirical analysis of Motivation Crowding-Out. American Economic Review, 87(4): pp. 746ff.

Geissler, J. (1998): Shiffle, throw or take it! Working efficiently with an interactive wall. In: Proc. CHI'98, Los Angeles, LA.

Goffin, K. and Pfeiffer, R. (1999). Innovation Management in UK and German Manufacturing Companies, London: Anglo-German Foundation (ISBN 1 900834 17 0).

Gottschalg, O. (2004): Towards a Motivation-Based Theory of the Firm: Integrating Governance and Competence-Based Approaches. INSEAD Working Paper.

Hillery, G. A. (1955): Definitions of Community: Areas of Agreement, Rural Sociology, 20, pp. 111 – 123.

Ishida, T. (1998): Community Computing. John Wiley and Sons.

Koch, M. (2005): Supporting Community Awareness with Public Shared Displays. Proc. Bled Intl. Conf. on Electronic Commerce, Bled, Slowenien, Jun. 2005.

Koch, M. (2004): Building Community Mirrors with Public Shared Displays. Proc. eChallenges e-2004 Conference, Vienna, Austria, Oct. 2004.

Krueger, M. W. (1991): Artificial Reality III, Addison-Wesley.

Munshi, N.; Oke, A.; Puranam, P.; Stafylarakis, M.; Towells, S.; Möslein, K.; Neely, A. (2005): Leadership for Innovation. Summary Report from an AIM Management Research Forum in cooperation with the Chartered Management Institute, AIM Research, London, February 2005.

Mynatt, E. D.; Adler, A.; Ito, M.; Oday, V. L. (1997): Design for Network Communities. In: Proc. ACM SIGCHI Conf. on Human Factors in Compting Systems.

Oke, A. and Goffin, K. (2001). Innovation Management in the Service Sector. Management Focus, Cranfield School of Management, UK, Summer Issue.

Osterloh, M. and Frost, J. (2000): Motivation in a Knowledge-Based Theory of the Firm, Working Paper, Universität Zürich.

Reichwald, R.; Piller, F. and Walcher, D. (2005). Open Innovation at adidas-Salomon. Development and Evaluation of a Virtual Customer Lab in the Sports Goods Industry, paper submitted to RADMA 2005.

Robinson, S. and Stern, B (1997): Corporate Creativity: How Innovation and Improvement Actually Happen. Koehler Publishers.

Schlichter, J.; Koch, M. and Xu, C. (1998): Awareness - The Common Link Between Groupware and Community Support Systems. Community Computing and Support Systems (Toru Ishida eds.), Springer Verlag, pp. 77-93, Jun. 1998.

Snowdon, D. and Grasso, A. (2002): Diffusing information in organizational settings: learning from experience. Proc. ACM CHI'02 Conf. on Human Factors in Computing Systems, pp. 331-338.

Wenger, E.: Communities of Practice: Learning, Meaning and Identity. Cambridge University Press, 1998.

Zhang, J. and Ackerman, M. S. (2005): Searching for expertise in social networks: a simulation of potential strategies. Proc. ACM SIGGROUP Conf. on Supporting Group Work, Sanibel Island, FL, ACM Press, pp. 71-80.