

# Using Groupware for Mediated Feedback

Matthias Finck

Faculty of Informatics

University of Hamburg, Germany

finck@informatik.uni-hamburg.de

Dorina C. Gumm

Faculty of Informatics

University of Hamburg, Germany

gumm@informatik.uni-hamburg.de

Bernd Pape

Faculty of Informatics

University of Hamburg, Germany

pape@informatik.uni-hamburg.de

## ABSTRACT

Mediated feedback is based on technical media or human mediators in order to enable or enhance the interaction between users and developers in a participatory design process. In this paper we deal with a special kind of mediated feedback: We argue for using a web-based groupware system as a feedback channel for the further development of the same groupware system. We motivate and illustrate this way of participatory design by describing a case study and derive advantages and disadvantages for using a groupware system as feedback for its own development.

## Categories and Subject Descriptors

K.3.1 [Computer Uses in Education, Collaborative learning],

D.2.2 [Design Tools and Techniques],

H.5.3 [Group and Organization Interfaces]

## Keywords

Participatory Design, Evolutionary Software Development, Mediated Feedback, Groupware, Community System,

## 1. MOTIVATION

In a project where we develop a Groupware system following the Participatory Design approach, we are confronted with a large and partly unknown user group. Such a user group makes it difficult to involve users directly in the development process. We searched and analyzed opportunities to involve users in different mediated ways. We call it mediated feedback when we use a software system as well as additional persons to support such process.

Since our setting of development is cooperative work and the involved persons are dispersed, it suggests itself to use a groupware tool for supporting Participatory Design. Due to the fact that the tool developed in our project itself is a groupware tool, we tried an approach for using the developed system itself to support mediated feedback for its own development.

We argue that on one hand context factors ask for mediated feedback and on the other hand that using the developed software itself provides situated feedback, i.e. while users are using the system already. Continuous situated feedback is especially important to get users' feedback in an evolutionary software development process based on prototyping methods.

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## 2. WAYS OF GATHERING FEEDBACK

The necessity of involving users in the software development process is well known. The involvement aims at gathering feedback for the work developers are about to do or have already done. In the field of Participatory Design and Requirements Engineering, a lot of methods have been developed and introduced, for example user requirements elicitation in the very beginning, prototyping to involve users in the process, observation techniques while users use the system and more (cf. [7], [8]).

The methods for getting feedback fall into two categories: *direct* and *mediated* feedback methods. Direct feedback methods benefit from the direct contact between developers and users, for instance during interviews, focus groups, or observation methods (cf. [7]). Mediated feedback calls for a medium between users and developers; such media could either be technical like E-mail, bug trackers or similar systems (cf. [6],[3]), or human, i.e. additional persons (cf. [5]).

Grudin [5] describes these "personal feedback channels" as additional partners in the development process who informs "developers of users' needs and inform [...] users of technological opportunities" (p. 64). Using "personal feedback channels", developers have to be aware of some problems mediators can cause in transmitting feedback from users to developers. First, users have to familiarize themselves with the mediator, so that they are disposed to give him feedback of their problems. Second, users have to have trust in the mediator as a channel to the developers. Third, they have to trust the mediator in transmitting the feedback in a correct way: Mediators interpret the usability problems the users told them. Any interpretation will make the original feedback diffuse. Fourth, the mediator has to be motivated to act as one because the mediator's role causes much effort.

In our research project we analyze two different ways for mediated feedback by combining the technical and personal "feedback channels". In this paper we present our case study and the corresponding results.

## 3. CASE STUDY

Our approach is to involve a large, unknown and dispersed user group by applying mediated feedback methods. To ease the readers' understanding of this approach we will first describe the groupware we develop and second the setting of the development process, the context factors.

In our research project we develop a web-based groupware system called CommSy that supports the communication and

coordination in working and learning groups<sup>1</sup>. The most important part of our system are *Project Rooms*, which are designed for closed learning groups of approximately 10 to 30 members. These groups normally work for a limited period of time. To support learning group activities, CommSy offers several groupware functionalities: News and events can be announced, specific topics can be discussed in discussion forums, members have a personal homepage to present themselves to the group, working material is collected in a simple reference manager and can be classified there, and annotations can be made for every item in a Project Room. The person who establishes a Project Room is called *facilitator*. She or he invites a learning group to use this room and facilitates the group work and CommSy usage.

CommSy's development started in May 1999 in the Department of Informatics, University of Hamburg. It has mainly been used and evaluated in the education environment. Therefore, the main user group consists of teachers and students belonging to this department. Beyond that, a huge number of users originates from various universities and academic disciplines all over Germany. The system has been actively used on different servers in about 500 cases and with approximately 6,000 users.

The development of our groupware founds on a participatory and evolutionary design process which is related to the STEPS model (cf. [4]). The design process has been considered as organization and software development (cf. [9], [11]). User participation has taken place during the entire design process by applying a mix of participatory design methods and feedback channels as well as continual evaluation. Knowing the benefit of getting direct feedback, we have been using a mixture of methods like interviews, questionnaires, workshops and more (cf. [10]). However, some of our context factors complicate direct feedback or even force mediated feedback:

*An unknown user group:* We develop CommSy in a prototyping-based software development process and apply it mainly in university courses. Therefore, we offer a new version of CommSy almost each semester. So each prototype is used by some new users, too, because each semester new students join courses which work with CommSy. However, this situation causes a problem: we do not know exactly the users we design the system for.

*Time discontinuity:* Often developers will not get to know a new user group until it has spent some time using the system. Developers are confronted with a time discontinuity between designing the software and knowing the users the system is designed for.

*Distribution of users and developers:* The local distribution of users may cause difficulties in meeting them and therefore to apply direct user involvement methods.

Ensuring situated feedback is another challenge we are facing. Not knowing our users exactly, we cannot motivate them to give us situated feedback. If we get to know them, it is often too late to ask users for usability problems because on the one hand they do not remember each detail, and on the other hand they often have learned to live with their problems or found a work-around.

Due to these context factors we use a variety of standard technical channels for mediated feedback as e-mail, bugtracker or log file analysis. Additionally, we try an innovative way for gathering mediated feedback. Due to the fact that all users work with CommSy and the facilitators of the Project Rooms are available to us, we established two mediated feedback channels by combining CommSy as the technical and the facilitators as the personal part of these channels. How these channels are used, the profits and problems they cause, and our experiences using such mixed mediated feedback channels will be described in the following sections.

## 4. FINDINGS

### 4.1 The Facilitation-CommSy

In order to establish and maintain contact with the facilitators of CommSy-Project Rooms, we twice established a special Project Room, a so-called Facilitation-CommSy, to which we invited facilitators of existing Project Rooms. In our invitations to join the Facilitation-CommSy, we stated the goals of this special Project Room as follows:

- Exchange of information about and feedback for the ongoing development of CommSy;
- Exchange of experience in facilitating Project Rooms with other facilitators and the development team.

Our first effort to establish a Facilitation-CommSy took place from March to July 2001 and the second effort from October 2002 to December 2003. Whereas using the first Facilitation-CommSy worked out fine and offered a rich source for user feedback, the second one failed.

In the first Facilitation-CommSy, 37 of 145 facilitators on the respective CommSy-Server took part. The CommSy-Server was hosted by the provider of an internet portal for students of German universities (cf. [2]).

Within the five-month life period of the first Facilitation-CommSy, the 37 participants posted 23 news, 15 events, and 211 statements in the discussion forum. From the beginning and throughout the entire lifetime of the first Facilitation-CommSy, the discussion statements predominately dealt with bugs and the usability of the Project Rooms. There were 133 statements which mainly addressed these topics. In the second half of the Facilitation-CommSy's period of life, two additional topics became more and more important: 41 discussion statements dealt with the particular use contexts and 37 hints concerned the facilitation of the Project Rooms. Therefore, the Facilitation-CommSy helped the development team to imagine the different kinds of CommSy usage of the locally dispersed users.

The second Facilitation-CommSy was established on a CommSy-Server run by the development team from October 2002 to December 2003 (cf. [2]). There were 24 participants in this second Facilitation-CommSy who posted 19 news, 12 events, and 20 statements in the discussion forum. Thus, in a longer lifetime there were less postings in the second Facilitation-CommSy than in the first one. Plus, most of the postings in the second Facilitation-CommSy were entered by members of the development team. Hence, the second Facilitation-CommSy did not lead to a rich feedback process between the users and developers of CommSy.

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<sup>1</sup> More information about CommSy is available at <http://www.commsy.de>

In our opinion the first Facilitation-CommSy proved to be a successful feedback channel. Back then it was the only way for users and developers to get in touch. Due to a business dispute between the CommSy provider and the development team there were no other established feedback channels. Plus, since it was a rather early version of CommSy, users detected many bugs. These bug reports proved to be a low-level reason for the users to seek initial contact with the developers that often expanded to a discussion on the particular use context and means of facilitation. Furthermore, the users were pioneer users willing to take an extra effort in order to influence the development of CommSy.

At the time we established the second Facilitation-CommSy, we also offered various other feedback channels: workshops, email, questionnaires, a telephone hotline. In addition, this Facilitation-CommSy dealt with a later version of CommSy. Thus, the existence of fewer errors led to less low-level contacts between users and developers. The users were either more experienced and did not depend on an exchange of experience, or not willing to make an extra effort to improve CommSy.

## 4.2 The Feedback Discussions

The second way of using CommSy to get mediated feedback is using the *discussion* functionality in Project Rooms to get feedback from the working group.

The original goal of the feedback discussions was to deal with the so-called *cold start problem* and to give users an incentive as well as a platform for expressing problems and ideas about CommSy usage. The cold start problem describes the situation that an empty system normally doesn't create needs for using it. It is important to fill the system with some content and examples of use. This problem is typical for groupware tools.

Our efforts in handling the cold start problem have led to action proposals for motivating users to use the system (cf. [1]). We recommend exemplifying actions to users through one's own behaviour. These action proposals have been adapted by several Project Room facilitators. An effective action proposal is, for example, to initiate a feedback discussion in a Project Room. Typical discussion threads like "How do you like the room color?" are helpful in two ways: On one hand, they invite users to use the system and familiarize themselves with it, and they lower the barrier to initiate discussions by oneself. On the other hand, such discussions are an instrument to accustom users to discuss their feelings and opinions about the use of CommSy. When users are familiar with using the CommSy discussion, new discussions can be initialized about usability problems with CommSy.

We had successfully tried gathering feedback by using the discussion functionality when applying CommSy in our own learning groups. Due to the fact that we had no access to others' project rooms, we needed a mediator to contact the users. Since we knew that a couple of facilitators adapted the previously mentioned action proposals, we contacted the facilitators and asked them to gather usability feedback for us. We gave them hints how to initiate discussions and told them what we were interested in. The users' statements were resumed by the facilitator by regularly transmitting the results of the discussions to the developer team. In this way the developers were informed about the usability problems of CommSy users we were not aware of. The facilitator was informed about design decisions based on these requirements by the developer team via email. Therefore, he

was able to post a new entry in the Project Room to inform the other members about the developing process. This feedback increased the users' motivation to discuss CommSy.

Our experience with the discussion forums as a feedback channel is quite positive regarding the quality of feedback we got, but ambivalent regarding the frequency of occurrence.

The high quality of feedback we attribute to:

- **Transparency:** the facilitator transferred the feedback to the development team, then she or he posted corresponding design decisions back to the users.
- **Feedback in situ:** Users were able to formulate feedback immediately when problems or ideas came up, and they were able to use functionality they had already used for their group work.
- **Motivation of facilitators:** Most of the facilitators using this feedback channel were interested in the development of CommSy and therefore motivated to establish such discussions as well as the double-sided feedback transfer.

The frequency of usage, which was not as high as we expected, we attribute to the effort for the facilitator:

- The facilitator has to motivate the Project Room members to participate in the feedback discussion.
- More effort is required by the facilitator to transfer the feedback. The facilitator has to summarize the discussion thread regularly to transmit the results to the developer group and to post the corresponding design decisions in the discussion thread.

To ensure the usage of this channel, the following conditions must be fulfilled:

- The facilitator of a Project Room needs to know members of the developer team and have a regular exchange with them.
- The project members have to know and accept that their private discussion will be relayed to the developer team.
- The developers have to react as soon as possible, so that the facilitator is able to post design decisions in the discussion.
- The facilitators have to tolerate the workload using the CommSy discussion for mediated feedback.

## 5. CONCLUSION

This paper discussed mediated feedback to involve unknown and dispersed users in a participatory design process. We presented a case study with context factors that ask for mediated feedback.

Our approach was to combine a technical channel (the groupware) with a personal channel (the facilitator) to create a mixed feedback channel. One way is to use CommSy discussions as feedback channel in conjunction with a mediator who transmits the feedback. The other way is to initiate a special CommSy project room for discussing the usability issues among facilitators and developers. With this case study, the following lessons have been learned:

**Participatory Design can be supported by using groupware.** Even if a large user group is available for direct feedback methods, using media for involving more users probably makes more high quality feedback available to developers.

**Using the developed system itself makes situated feedback possible**, since only familiar feedback channels are used. The mediator between users and developers is also the facilitator for the project room and therefore already known by the users. CommSy as the software of choice for the users' cooperative work is also used as a feedback media channel and therefore users are already familiar with this channel. In addition, users do not have to switch media during their work; for example, they do not have to start their email client or any reporting system. They also do not need an additional contact person; the project room facilitator is their contact for questions regarding the course as well as for questions regarding the usage of CommSy.

**Developers must be aware of interpretation problems.** The facilitator's additional role of mediator causes difficulties in interpreting feedback. The facilitator has to distinguish between questions regarding the special usage of CommSy in this course context and questions regarding general usability problems that have to be transmitted to the developer team.

**Mixed feedback channels lower disadvantages.** Users that are not able to use CommSy cannot use it as a feedback channel. If CommSy is unusable for users to the extent that they cannot handle it as a feedback channel, the user with the most important feedback will not be heard. This disadvantage is attenuated by using a personal channel as well as a technical one. If any user is unable to use the CommSy discussion as a feedback channel, he or she still has the facilitator as a contact to give feedback.

**High quality feedback needs high interest of involved persons.** In our case study we experienced that we got high quality feedback if facilitators were highly interested or involved in the system's development. In this situation the facilitators were able to motivate the Project Room members, and they were interested in giving feedback regularly.

Still, the question whether this kind of mediated feedback is an auspicious alternative to other common methods is not fully answered yet. Further work is required to evaluate the role of the mediator as well as that of CommSy. The role of the mediator must be analyzed regarding the question if the mediator must be a member of an existing working community (like in our case study), and if our approach works also with an additional person as recommended by Grudin [5]. Also, an evaluation of supporting feedback by groupware is needed: one open question is whether other groupware systems are suitable for use as a feedback channel for their own usability problems. Therefore, different groupware systems in different contexts can be analyzed. Such evaluation could either verify or falsify our promising feedback approach, and we might prove how suitable it is to use groupware for mediated feedback in general.

## 6. REFERENCES

- [1] Bleek, W.-G., Kielas, W., Malon, K., Otto, T. and Wolff, B. Vorgehen zur Einführung von Community Systemen in Lerngemeinschaften. In Engelen, M.; Homann, J. (Eds.), *Virtuelle Organisation und Neue Medien. Workshop GeNeMe2000. Gemeinschaften in Neuen Medien*. Lohmar, Köln: Josef Eul Verlag, 2000, p.97 - 113.
- [2] Bleek, W.-G., Jackewitz, I. and Pape, B. Matching Needs – Application Service Providing for Asynchronous Learning Networks. In Sprague, R.H. (Eds.), *Proceedings of the 36th Annual Hawaii International Conference on System Sciences 2003*. Los Alamitos, CA u.a., 2003.
- [3] Divitini, M., Farshchian, B.A., and Tuomo Tuikka. *Internet-based Groupware for User Participation in Product Development* SIGCHI Bulletin Volume 32, Number 1, 2000, p. 31 - 35.
- [4] Floyd, C., Reisin, F.-M. and Schmidt, G. STEPS to software development with users. In *ESEC '89, Lecture Notes in Computer Science, no. 387*, Berlin, Heidelberg. Springer, 1989, p. 48 - 64.
- [5] Grudin, G. *Interactive Systems: Bridging the Gaps Between Developers and Users*, Computer Vol. 24., IEEE Computer Society Press (April 1991) No. 4, p. 59 - 69.
- [6] Jeenicke, M., Bleek, W.-G. and Klischewski, R. Revealing Web User Requirements through e-Prototyping, In *Proceedings of the Fifteenth International Conference on Software Engineering and Knowledge Engineering (SEKE 03)*, San Francisco, USA, July 1 - 3, 2003.
- [7] Kujala, S. User involvement: a review of the benefits and challenges. In *Behaviour and Information Technology*, 22(1), 2003, p. 1 - 16.
- [8] Macaulay, L. A. *Requirements Engineering*. Applied Computing. Springer Verlag London, 1996.
- [9] Pape, B. and Rolf, A. Integrierte Organisations- und Softwareentwicklung für kooperative Lernplattformen in der Hochschule. In B. Pape, D. Krause, and H. Oberquelle (Eds), *Wissensprojekte. Gemeinschaftliches Lernen aus didaktischer, softwaretechnischer und organisatorischer Sicht*. Waxman, 2004.
- [10] Strauss, M., Pape, B., Adam, F., Klein, M. and Reinecke, L. *Commsy-Evaluationsbericht 2003: Softwareunterstützung für selbstständiges und kooperatives Lernen*, FBI-HH-B-251/03, 2003.
- [11] Wulf, V. and Rohde, M. Towards an Integrated Organization and Technology Development. In *Proceedings of the Symposium on Designing Interactive Systems*, New York, 1995, p. 55 - 64.