

EVALUATION CONCEPT FOR INTEGRATED KNOWLEDGE AND CO-OPERATION PLATFORMS

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Abstract: This article introduces a concept for evaluating integrated knowledge and co-operation platforms which was derived from systematic examination of computer supported co-operative work (CSCW) and knowledge management systems and from research of available evaluation approaches to CSCW and knowledge management systems. It consists of various evaluation perspectives (individual, group, organisation, environment and technical system), thereby introducing comprehensive objectives, specifying topics and exemplary items for these perspectives. Considering experiences made with this concept, potential implementation scenarios are introduced.

1 INTRODUCTION

The impact of so-called knowledge work on enterprises and organisations is increasing. Merging CSCW and knowledge management systems in an integrated knowledge and co-operation platform can technically support the process of knowledge work in a comprehensive way (Fuchs-Kittowski and Reuter 2002). The value of any technical support can be determined by evaluation (Englberger 2001). As the idea of an integrated knowledge and co-operation platform is new, there is no evaluation concept available at present. Former concepts regarded either CSCW or knowledge management systems.

This article introduces a concept for evaluation of integrated knowledge and cooperation platforms derived from systematic examination of computer supported co-operative work (CSCW) and knowledge management systems and from research of available evaluation approaches to CSCW and knowledge management systems. Based on this approach different evaluation perspectives are deduced which are described by comprehensive surveys and specifying topics.

2 DEVELOPING THE CONCEPT

The first step in developing the concept was to approach CSCW and knowledge management systems systematically. As a result, the following working definitions for CSCW and knowledge management systems were specified:

- CSCW systems consist of computer technologies for supporting any kind of communication, cooperation, and coordination in groups.
- Knowledge management systems support varying processes of generating, gathering, securing, transmitting and utilising knowledge for the benefit of an organisation.

Moreover, similarities, differences, aims, and supporting technologies of both system classes were identified. In CSCW systems work on the object is at the centre. Thereby, group work independent from time and space shall be facilitated (see Teufel et al. 1995, Krcmar and Schwabe 1996b). In knowledge management systems, knowledge of the object is in the focus. Technical support is meant to make knowledge in an enterprise easy to communicate, recyclable and expandable.

Evaluations of knowledge management systems mostly examine the availability of technical support for certain knowledge management strategies, and resp. how often these are applied by users. These are predominantly easily quantifiable aspects that have been determined in research (e.g. Zack 1999).

Further evaluations of CSCW and knowledge management systems stress the comparison of systems and their support functions (Stevens and Scholtz 1999, Cobos et al. 2002, Mueller-Prothmann and Siedentopf 2003). It is generally apparent that there are only a few comprehensive concepts for evaluating knowledge management systems (Maier and Haedrich 2001, Quek and Shah 2004) and CSCW systems (Ramage 1999). As a result of the analysis of evaluation approaches for CSCW and knowledge management systems deficiencies could be found in the support of unpredictable, creative or social processes and the impact an individual, a group, the organisation or the environment/setting has on a CSCW or knowledge management system.

In addition, there is still a lack of evaluation concepts explicitly designed for integrated knowledge and cooperation platforms. Based on the analysis of CSCW and knowledge management systems and the findings in scientific references, an evaluation concept for integrated platforms was deduced and will be introduced in the following part.

3 DESCRIPTION OF THE EVALUATION CONCEPT

The evaluation concept introduced here regards five perspectives:

- The individual perspective, i.e. an individual systems user (employee),
- The group perspective including communities,
- The organisational perspective, where the system is (partly) applied,
- The environmental perspective, i.e. the relevant world beyond the organisation,
- The system perspective, i.e. the integrated knowledge and co-operation platform.

This subdivision is based on the following consideration: individuals can form groups. They are employees. Groups consist of employees of an organisation. This organisation is embedded in an environment. The technical system (platform) is provided to some or all individuals/groups of the organisation and thus penetrates the other perspectives. For this reason, some items can for example be attributed to the individual perspective and/or, according to focus, to the system perspective.

The evaluation concept provides every perspective with comprehensive tasks, specifying topics and exemplary items. Generating an

exhaustive list of items is not sensible as they must always be depending on the evaluated system, the evaluation context and the requirements of the evaluating person.

The perspectives individual, group, organisation and environment are similar in structure. The comprehensive tasks refer to the respective interdependency with the system. They are specified for every perspective by identical topics. The topic items differ from perspective to perspective. The group perspective was additionally supplied with the topic "founding a group" as groups are at the centre of interests in an integrated platform. The system perspective that all other perspectives refer to has a different structure. Here are predominantly system-describing components more important than interaction with the system.

Table 1 shows the exemplary structure of the evaluation concept with the perspective *group*. The entire structure is shown in Table 2.

Table 1: Implementation of the Group Perspective

| Task | Topic | Indications for generating items |
|--|---|---|
| Which impact does a group have on the system? | Improvement | Have suggestions for improving group work been generated and introduced to the system? What do they refer to? |
| | acceptance/ motivation for application | To which extent is the system utilised for group work if there are occasions for it? How is the system accepted by groups? |
| Which effects does the system have on the group? | facilitation of group formation | How far is self-directed and task-related formation of groups facilitated? |
| | effect by utilising the system on the work per se | Which are the precise objectives of the groups when applying such a system for their collaboration, and how are these regarded by the system? |
| | handling of knowledge and knowledge gain | Which system features were used in the group for generating new knowledge and how does the system motivate users to preserve/secure it? |
| | support of social processes | How strong is the trust in other group members? |

Table 2: Structure of the Evaluation Concept for integrated Knowledge and Co-Operation Platforms

| Perspective | Comprehensive Task | Specifying Topics |
|---|---|--|
| Individual Group Organisation Environment | Which impact has the individual/ group/organisation/environment on the system? | Improvement |
| | | Acceptance and motivation for usage |
| | Which impact has the system on the individual/group/organisation/environment? | Impact of usage on work per se |
| | | Handling of knowledge and knowledge gain |
| | | Support of social processes |
| Technical System | Which is the system status? | Support of group formation (<i>only group</i>) |
| | | Development phase |
| | Can the system be adjusted to specific user needs, habits and wishes? | Available functions |
| | | Independent selection of tools |
| | | Independent organisation of knowledge/contents |
| | How does the system support different knowledge management strategies? | Configurable message function |
| | | Codification |
| | | Socialisation |
| | | Personalisation |
| | Does the system support creative processes? | Combination of approaches |
| | Does the system support unpredictable processes? | Support of creativity by tools |
| | | Integration and organisation of knowledge |
| | Which links of the system with tools available to users are there? | Integration and organisation of or with persons |
| | | Available tools |
| | | Integration of available tools |
| What are the characteristics of the functions and how are they dealt with? | Utility | |
| | Usability | |
| | Application of system by users | |

4 EXPERIENCES

During the project „Knowledge co-production in knowledge-intense services“ (German abbr.: WiKo), the Fraunhofer Institute for Software and Systems Engineering Berlin in collaboration with the Fraunhofer Institute for Applied Information Technologies developed an integrated knowledge and co-operation platform for supporting interaction-oriented knowledge management. In the test phase of the prototype valuable experiences with the evaluation concept were gathered. Two major approaches of putting the concept into practice were observed:

Top-down: Hypotheses are deduced from a given task. In doing so, relevant perspectives, questions and topics for these perspectives are taken into consideration. On this basis, the hypotheses are substantiated. Defining relevant perspectives is important in this process. Reducing the complexity of the hypotheses to a maximum of two perspectives for consideration proved sensible. The system perspective in combination with one of the other perspectives was the common case. A considerate selection of topics allowed a fast and easy generation of corresponding items. In approaching step by step, the hypothesis as well as the corresponding questions can be looked at from

different angles. This allows for generating items comprehensively and for emphasising certain aspects in a considered, conscious and well-founded way.

Bottom-up: In developing survey instruments, the evaluating persons appeared to have had considered certain items in advance that seemed to be of higher interest or should generally be regarded in an evaluation. Our evaluation system allows for bringing such items into a context. They are allocated to a perspective and a related topic. A further step deals with analysis of the topics relevance for the evaluation. If the topic is relevant, further items can be generated. If the topic is irrelevant, the items need not be regarded.

In analysing and interpreting data, perspectives and topics help continually focussing on vital aspects, affirm or disprove hypotheses. Summarising, with the help of perspectives, questions and topics the survey results can be illustrated and demand for further evaluation or further development of the system considered may be shown. The contents of the system perspective provide essential questions and topics for developing integrated knowledge and co-operation platforms and for iterative development processes. At the time of introducing the prototype for practical work or platforms in operation contents of all perspectives must be regarded. Comparing platforms, they should

be done on the basis of questions and topics of the system perspective. If there are practical experiences at hand, all other perspectives should also be compared for drawing comprehensive conclusions.

No evaluation considers only the questions and corresponding topics described above. Further aspects influencing the results also need to be regarded. Such influences may be survey instruments, sample surveys, the setting for the evaluation, available time, technical and financial resources. Bringing these factors of influence into consideration, the application of the evaluation concept portrayed here leads to a systematic and standardised approach to knowledge and co-operation platforms.

5 DISCUSSION

It was proved that the concept supports the following phases in evaluating integrated knowledge and co-operation platforms: the generation of questions, hypotheses and items, whereby a top-down respectively a bottom-up approach could be distinguished, furthermore data analysis, the interpretation of data, the allocation of results into a general concept, and the deduction of future proceedings. Applying this concept allows the comprehensive systematic comparison of different platforms. Unfortunately, this could not be realised so far. Furthermore, the concept entails different opportunities for extension. It was already pointed out that the system perspective influences all other perspectives. The interaction of the system with all other perspectives is continuously brought up. The interaction amongst the other perspectives was explicitly not regarded for not making the evaluation concept too complex. An extension would be a sensible addition to the concept. A further extension could be the development of particular items for single topics of the perspectives. On one hand, this would result in higher standardisation of the approach and better comparability of results. On the other hand, it would lead to a loss of flexibility of the concept. This openness allows for putting different emphasis and for adding special cases depending on the evaluation context. Putting the concept into action motivates to view the evaluation of the platform from different angles. This supports the generation of new ideas and broadens understanding.

An evaluation concept can only provide the evaluating person with an appropriate setting if he/she is able to properly classify his/her own objectives and relevant objectives of other persons, of groups, of the organisation or even of the

environment. Predictable and unpredictable frame conditions have a great impact on the operation and the results of any evaluation. The evaluation concept must therefore be flexible. The deduced perspectives *individual, group, organisation, environment* and *system* can each be applied individually for generating relevant data; but grasping the platform to be evaluated in its entirety it is necessary and advisable to include all perspectives in the evaluation.

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