

# Escalating Helpdesk

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## Abstract

Escalating Helpdesk is a pattern of knowledge management solutions. The usage of a hypermedia content repository is combined with the integration of annotated question-answer dialogues. Insufficiency of proposals for solving problems can be compensated involving experienced employees or experts. Communications can evolve which adds continuously to the content database which has to be systematically maintained. This pattern is appropriate for those constellations where help for problems can not be provided timely or sufficiently by classical means such as telephone or face-to-face help desks.

## Context:

Help in businesses and communities is provided in many areas to solve practical problems. Providing and distributing help is one kind of knowledge management as a socio-technical system. Help can be conveyed by referring to a hypermedia database or via direct or computer-mediated communication between persons. The integration of these different forms of providing help can be improved by referring to concepts of organizational memories. Specific problems where computer-mediated help is reasonable occur when software or hardware is used for carrying out tasks in varying domains. Providing and using help as a communication process, which adds continuously to a database, can be considered as training on the job in the context of organizational learning. To select such a solution means to compare its advantages with the work of help desk staff, with a sheer discussion forum or with a software-based help system or help assistants.

## Problem:

When a problem occurred, knowledge or help is needed on various levels of urgency – but was not available.

The processes of acquiring knowledge for practical problem solving (e.g. in training sessions) and the situations, where the knowledge is needed, are disintegrated. When problems occur during every-day work, it is difficult or awkward to get access to people who could offer help.

## Forces:

Various forces need to be considered before using this pattern:

- There are a lot of documents and ongoing communication which are helpful to solve problems but are not systematically recorded.
- Willingness and sufficient resources are available to document problem solutions, maintain a database and guarantee the timely answering of questions.
- The employees are used to work with computer-based networks and to exchange computer-mediated question-answering dialogues, and they want to avoid switching between different media.

- It is considered as reasonable that providing help is not only the task of experts, who might be stressed by a work overload, but also of experienced users who might be willing to contribute their knowledge without expecting an immediate payback.
- The company tends to save resources needed to provide courses which help the employees to overcome problems.

Conclusion: If problems and solutions regularly occur, both can be explicated (basically with text and hypermedia) and there is a large community that can help each other, this pattern is an option.

## Diagram

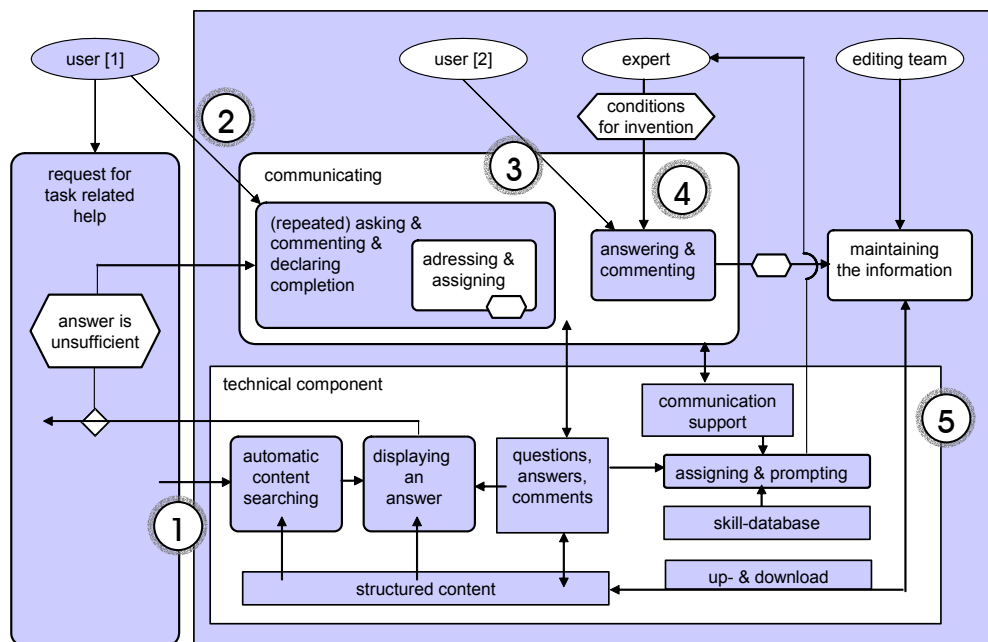


Figure 1: Escalation

## Solution:

Introduce a system that supports users as employees or members of communities by following an escalation procedure of four steps. The system should support users

- 1) to search a basis of documented solutions for problems, which occur commonly in the organizational unit which should be supported.  
If there is no sufficient solution available,
- 2) users can publish their problem by posing questions to other users and possibly start a question-answer dialogue.  
If other users cannot provide a sufficient answer
- 3) an expert has to answer the question and offers a dialogue.  
If the solution is of common interest
- 4) the answers can be edited and integrated into the documentation of solutions for common problems.

The diagram in figure 1 explicates these steps: Employees who have a problem should first search a content data base to learn whether they have a problem which has already been

solved (① in figure 1). If not, they can publish their problem ② so as to receive help from other users ③ or experts ④. Experts can be found with the help of a skill database; an editing team maintains the content database ⑤.

The Diagram (see figure 1) depicts that certain features of a technical system are combined with the activities of people who have to take certain roles. There are technical features and components required:

- Stored, *structured content*<sup>1</sup> which is searchable (*content searching*) by the *user* or a search-engine to find answers to emerging questions. (elements part of technical components in figure 1)
- *Communication support* which allows users to exchange questions, answers and comments and to insert them into the appropriate parts of the content. Furthermore, selective communications should be possible by addressing recipients who will then be able to read the contributions. An awareness mechanism should inform the addressees that a contribution has taken place.
- A *skill-database* should be employed – by using an appropriate matching algorithm – to assign requests to experts (if they are not selected by the help seekers) and to trigger them.
- An editing team should scan the ongoing communication for content with broader relevance, and should integrate this content to the stored content. Therefore an *authoring and up- and download support* is helpful.

The roles (ellipses) and activities (cushions) in the diagram characterize the possibilities of escalating help. If the content search (escalation level ①) does not provide a sufficient answer, the question can be published in the system (level ②) so that other users can offer their help (level ③). If other users do not help, a group of experts has to intervene with respect to certain rules and conditions which have been determined by the company (level ④). A skill-database for selecting experts whose knowledge corresponds with a question can be integrated. The selected experts can be automatically or manually be addressed and prompted to propose a solution.

The diagram shows that the involved roles have a number of options to enable them to make free decisions, too. User[1] can decide whether he publishes a question or not and as to which audience it is made available. User[2] may choose as to whether he will intervene or not. A dialogue might eventually evolve. The editing team can then decide as to whether they analyze such a dialogue to improve the stored content or not. Due to these options there is not only one but a multiplicity of potential paths as to how the activities shown in the diagram can be combined.

## Synopsis

A system provides knowledge-related help in problem situations on different levels. If the support on the first level (a database of known problems) is not sufficient, the next levels (contacting users and finally experts) can be activated and so on.

## Examples and known uses

Rationale for this pattern description and other patterns can be found in [4].

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<sup>1</sup> Elements shown in figure 1 are in italics.

The pattern of escalating help-desk was mainly influenced by one of our nine studies that took place in an industrial company with more than 6.000 employees. The escalating help desk system was introduced at about 2.400 workplaces. The introduction started with a 2 hour training session for the employees. 14 days after the training session we conducted in-depth interviews with 16 randomly chosen users on different hierarchical levels, and of different educational backgrounds. Six weeks later, we analyzed their participation in the discussions to get an impression of how often employees contributed to the system. We repeated the monitoring of the participation in the system based discussions after the employees had used the system for 6 months. At this point we also took a closer look at the content type and structure of contributions. We used the results of this monitoring as a basis for questions in the follow-up interviews with three participants who had not used the system intensively and three who had. In this second round of interviews we paid special attention to the frequency of their system use and the reasons for it, as well as their views on the participation of other employees. For a detailed Analysis see [3].

The Answer Garden systems [1] [2] are instances of this pattern. The structure of escalation (FAQ → other users → experts) within a community of developers were first described there.

## Related Patterns

This Pattern is related to various patterns for knowledge management and patterns for the introduction of knowledge management technology. Alternatives of this pattern include simple local help systems, systems providing assistance or hotlines / help desks.

A combination with patterns for introducing and establishing the pattern are needed. The software needs to be technically implemented, training of users for the help system is needed, a baseline of content must be provided, users' motivation of using the system has to be considered etc. Some patterns for these tasks can be found in [4].

## Diagram Notation

The diagram uses the notation SeeMe which represents roles (shown as ellipses), activities (represented as cushions) and entities (objects, systems etc. shown as rectangles) and their relations. SeeMe can represent various types of vagueness, which is specifically useful for the description of socio-technical systems. For further details on SeeMe see [5].

## Literature

- [1] Ackerman, M. S. Augmenting Organizational Memory: A Field Study of Answer Garden. *ACM Transactions on Information Systems* 16 (3), 1998, 203–224.
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