

ADAPTIVE SUPPORT FOR COLLABORATIVE KNOWLEDGE SHARING

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Abstract. Besides digital libraries, knowledge management systems based on knowledge sharing in communities of people represent another source of information that can be utilized by novice researchers or learners. One kind of these systems is Community Question Answering (CQA), such as Yahoo! Answers or Stack Overflow. However, existing CQA systems do not provide appropriate adaptive support to users who are only getting insight into a new domain. Therefore in our work, we propose novel answerer-oriented and organizational adaptive methods together with a CQA system named Askalot in which they can be applied and verified.

1. Introduction

Knowledge management systems provide people with many progressive ways how to create, improve and share knowledge. In general, these knowledge management systems can be divided into three categories according to their perspective of knowledge [4]: knowledge as object, knowledge embedded in individuals and knowledge embedded in communities.

Digital libraries traditionally fall into the first perspective in which explicit knowledge (i.e. a knowledge that can be formulated and expressed [3]) is stored in all objects - articles provided by the particular digital library. However, we emphasize that also communities of Internet users can represent another source of valuable tacit knowledge (i.e. an unarticulated knowledge that is in a person's head and it is difficult to describe it and transfer). Therefore, we consider the perspective of knowledge embedded in communities as an interesting and promising alternative how to obtain the knowledge. For novice researchers or learners, obtaining the knowledge from a community of other people can be sometimes even more effective in comparison with a digital library as they can collaborate and communicate together.

There are several types of knowledge management systems based on the perspective of knowledge embedded in communities, e.g. electronic discussion groups, chats or community question answering systems. We specifically focus on Community Question Answering (CQA) systems, which are very popular recently, such as Stack Overflow or Yahoo! Answers. CQA is a service where people can seek information by asking a question and on the other hand, share knowledge by providing an answer on the particular question.

2. Adaptive Support in Organizational CQA System

Growing number of users and solved questions proves the popularity and successful concept of community question answering. Moreover, CQA systems become the significant source of knowledge on the Web. As the result, CQA started to attract the attention of many researchers and consequently, in recent years, we witness increasing amount of research studies which concern with different aspects of CQA systems. The significant part of them focuses on providing adaptive support (e.g. automatic assignment of topics to newly posted questions, routing questions to potential answers or answer ranking). Another part of state-of-the-art research concern with analyses of data which are recorded during question answering process.

In spite of the increasing research effort on CQA systems in the recent time, their potential to support researchers or learners, who are only getting an insight into a new domain, is only to be discovered. For this reason, we focus on two open problems in our work: 1) absence of an answerer-oriented adaptive support; and 2) unresearched potential of organization-wide CQA systems.

At first, the main goal of CQA systems is to harness the knowledge of the whole community to provide the most suitable answers on the recently posted questions in the shortest possible time [5]. Besides this primary goal, we stress that the question answering process provides also a possibility to acquire new knowledge (as a specific way of informal learning). In spite of that, current adaptive approaches to support knowledge sharing in CQA systems focus primarily on receiving fast answer with the aim to primarily satisfy askers' needs. However, when we want to support novice researchers or learners, it can be beneficial to provide an adaptive support that consider this learning potential. Therefore, we suggest a novel concept of answerer-oriented adaptive approaches that primarily focus on attributes and preferences of answerers instead of askers.

Secondly, in spite of many positive results of CQA systems in the open web, the potential of CQA has not been examined in intra-organization environments yet. In the research context, which we are interested in, novice researchers would be able to take advantage of asking various questions about their research domain and receive knowledge from other more experienced researchers who can even be experts in the particular domains. Similarly, also learners in educational organizations can utilize CQA systems as a complement to formal learning in particular courses or even as an immediate component of learning process where community of students together with teachers can participate on solving questions related to students' learning.

In regards to the identified open problems, we propose new answerer-oriented methods to the recommendation of questions to potential answerers (so called question routing)

[1, 2]. In this recommendation, we take various information about users (e.g. knowledge level) as well as organizational specifics into consideration.

In order to evaluate the proposed methods in organizational environment, we develop a novel CQA system named Askalot (<https://askalot.fiit.stuba.sk/demo>). Its design is specifically dedicated to support novice researchers and learners at university in faculty-wide environment. Askalot was experimentally evaluated during a summer term at our university with more than 600 users. The results of the experiment confirm our novel perspective on CQA systems as non-traditional environments for supporting knowledge sharing among novice researchers and learners across whole organization.

3. Conclusions

In our work, we present Community Question Answering (CQA) systems as an interesting alternative to standard digital libraries in obtaining new knowledge by novice researchers or learners. However, standard CQA systems in the open web (e.g. Yahoo! Answers or Stack Overflow) and existing adaptive methods are not very appropriate for this specific kind of users. Therefore, we identified the necessity to propose novel methods that are designed specifically to consider answerers and organizational specifics. In particular, we develop new methods to route questions to potential answerers. In addition, we developed the first faculty-wide CQA system named Askalot that is designed to provide learners and researchers with the possibility to ask various questions about a domain about which they are just getting an insight.

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