



Ask Your Friends for Help: Collaborative Query Answering System (short paper)

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Abstract. The probability that we get help is greater if we ask a friend, rather than a stranger. On the basis of this sociological phenomenon, the innovative SocLaKE recommender system for query propagation in the social network was invented. In this paper, a general concept of the system as well as a discussion on various issues and challenges related to its application are presented.

1 Introduction

During each day of life of the organization, employees are asking questions, some of which are new and some are not. The answers for some of them can be found in documentation, forum, web logs and other content widely available in the organization. However, there are questions where discovering the answer is not a simple task. In such cases employees usually communicate with help desk or office supervisors and wait for an answer. This so-called "official way" can take a lot of time and many of these problems stay unresolved. Therefore, it is a significant challenge for a medium-sized and large organisations to simplify and speedup the process of finding the right answer for the questions which arise during a daily work.

What the employees can do, when they can not find the solution for their problem? The most common advice which can be given is "ask your friend", maybe the friends know an answer? If not, maybe they know someone who had the same or similar problem in the past and solved it? Then they can contact you with this person and you will get the solution. If your friends are not able to help you, they can ask their friends for help. In this way the question is propagated through the friends of the friends until the satisfying answer is found. Why this approach can prove to be efficient? Because people are more eager to help someone they know than a stranger, even if their expertise is out of scope of the question.

Company's standard communication system has no explicit information about informal social relationship between the employees. However, it is possible to extract this information from existing data. IT systems in every organization contain information about e-mail or instant messenger conversations, employees

common activities such as: the projects developed, the tasks solved, participation in meetings [1, 2], etc. This data can be used to create multi-layered social network of the company employees [4].

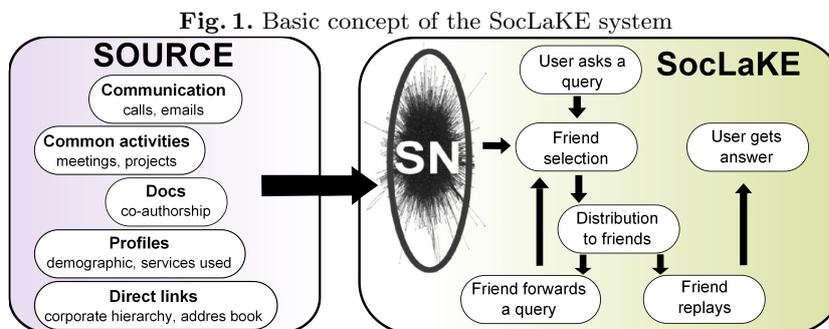
In this paper, we present the concept of the recommender system SocLaKE - Social Latent Knowledge Explorator [5, 6], which utilises this social network to propagate queries and to find reliable solutions in the fast way. Additionally, the discussion on various issues and challenges related to system application are presented.

2 General Concept of the System

The main goal of the system is to improve communication between organisation's employees. This improvement can be measured twofold: quantitatively, because more queries should be correctly answered and qualitatively, because the time needed to receive an answer should be shorter.

The query in the system is propagated through the social network of friends and colleagues. This process can be recognised in a real behaviour of people looking for an answer, when they do not know a competent expert directly. The system presented will support this process.

The basic concept of the system is presented in Figure 1. In the first step it is necessary to create a social network. Next, the system gathers information about the employees' knowledge. Several sources of information can be utilised in this step: any official or informal documents such as reports, notes, recruitment process information as well as e-mail or instant messenger contents, organisation structure, e.g., positions occupied and employees' responsibilities.



The following scenario can be realised by such a system. A user defines a question using e-mail or IM message. The system discovers domain of the question and returns to the user a list of the recommended users to whom the question can be addressed. The recipient of the message can send the solution back to the author of the question or using the same recommendation system and forward

the question to someone else. This can be repeated until the correct answer is found.

3 Discussion on System Functionality

In this section, various issues and challenges related to system application are discussed.

Privacy related issues

The information resulting from collecting and processing the data from different sources provided by organisation should not be accessible by the users of the system due to privacy issues. The list of the recommended users who possibly can help in solving a problem should be the only result of knowledge base analysis presented by the system. Therefore, it is required to properly secure the confidential content.

If both an expert and author of the question agree, the question and its solution can be stored in a local database. If a similar question is sent in the future, then the system returns the archive solution and relays the question directly to the recognized expert. Obviously, for the users who are concerned about the privacy of the messages, the system should provide possibility to turn this feature off for selected conversation.

Expert determination

The system has to decide who is an expert and what is the area of its expertise. Initially, the experts are identified utilising the knowledge derived from the company documentation as well as its organizational structure. During runtime, the system itself becomes additional valuable source of knowledge about experts. The employees continuously acquire the new knowledge and skills. Therefore, it is possible that a correct answer will be given to an author of a query by his colleague who was not recognised previously as an expert. Also each time the askers receives a correct response from an expert what increases their expertise in the area covered by this question. Such knowledge should be recognised and utilised by the system.

Expert and query management

An expert is a valuable employee and they should not be dedicated exclusively only to resolve problems of others. Hence, the system should prevent from a case when an expert receives too many questions. There should be a limit which can be either defined by an expert or dynamically adjusted to the expert's behaviour. If a question is rejected by an expert due to a current lack of time or for another reason, then the further recommendation of this expert should be delayed and other experts should be taken under consideration. The further inspirations how to manage this problem can be searched in the field of active queue management (AQM), e.g. [3].

The questions covering the same topic should be managed by the system and aggregated also in order to respect the expert's time preferences. Also answers can be managed by the system. It is possible to enable several answers for the same question which remains active in the system although the first solution has

already been provided. The author of a question should also have the possibility to assess the answer and rate it. It is possible to evaluate the expertise quality of experts in this way. Another approach is to introduce the methods of advanced feedback analysis as it was proposed for online auction systems, e.g. [7].

System dynamics management

Very important issue related to the operation of the system is the dynamics of the modelled organisation. The changes that will influence the system operation can be related e.g., to the structure of the organisation, informal social relations, knowledge of the users and their expertise, parameters of the query propagation model, etc. Therefore, the change management will be one of the significant challenges related to application of the system.

4 Conclusions

The general idea of the recommender system for query propagation based on the social network is presented in the paper. Several issues can be encountered while introducing the system of this kind. In particular, privacy related issues, expert determination, expert and query management and system dynamics management were discussed in the paper.

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