Knowledge Nets, Collaborative Techniques
for Knowledge Interaction[1]

Peter Funk

Mälardalen University, Department of Computer Science and Engineering,
721 23 Västerås, Sweden
http://www.idt.mdh.se/pfk
peter.funk@mdh.se

Abstract. About 60% of a companies corporate knowledge is said to be inside peoples heads. Sharing experience and knowledge in companies is unstructured today. Networks of people have proven to be efficient both within organisations and within groups of people sharing the same interest, profession etc. We propose an computer aided approach where experience and knowledge is the core, and by refocusing from storing/searching information, the issue is to capture and reuse high quality experience and knowledge between groups of people (experts, technical staff, administrative staff, students etc.). For this we propose the use of a number of different methods and techniques, in particular Case-Based reasoning and Collaborative filtering and user modelling.

1 Introduction

Today much attention is directed towards the web, searching relevant information, handling the information explosion and dilution problem (high quality information hidden among large amounts of irrelevant and erroneous information). In this paper it is proposed that the challenge is to move beyond information search towards sharing knowledge and experience.

Riesbeck and Schank: "*... the essence of how human reasoning works. People reason from experience. They use their own experience if they have a relevant one, or they make use of the experience of others ...*" [1].

About 60% of a companies corporate knowledge is said to be inside peoples heads. Sharing experience and knowledge in companies is unstructured today and is in large based on personal levels, to often the procedure is asking the colleague next door, knowing someone that may know something about the problem. It is said that we are in the transition from the information age into the knowledge age, unfortunately the

differences in work practice do not appear to be very large compared with 20 years ago, and storing documents on the intranet or a database may add more to the information overload than improve efficiency.

2 Sharing Knowledge

Networks of people have proven to be efficient both within organisations and within groups of people sharing the same interest, profession etc. These networks are in large based on sharing experience, knowledge and support. The value of such collaborating networks is already recognised in large organisations such as Ericsson and encouraged in different wais (also economically).

Giving users at an organisation (technical and administration staff, engineers, project administrators etc.) access to competence nets, experience, information, guidelines and also store this for reuse is essential for any business enterprise moving from the information age into the knowledge age. The value of a company in the information age is all the knowledge and experience of their employees together with their knowledge and experience the users may access. Identification of the needed knowledge may be critical in emergency situation (e.g. failing robot in production line, failure of industrial processes or mobile communication equipment preventing access to 112). Information today is increasingly stored in computer (technical instructions, documentation, FAQs, guidelines, tutorials, experience etc) but information quality is decreasing and information content often diluted. The growing amount of computer stored documents and information obstructs the goal to quickly find relevant information and experience.

The main focus to solve this growing quality and dilution problem is improving search engines. We propose a different approach where experience and knowledge is the core, and by refocusing from storing/searching information, the issue is to capture and reuse high quality experience and knowledge between groups of people (experts, technical staff, administrative staff, students etc.). For this we will use a number of different methods and techniques, mainly from artificial intelligence and in particular from Case-Based reasoning, Collaborative filtering and user modelling. The different pieces are already available, e.g. in technical domains, case and experience centered solutions have been applied to a variety of application domains such as: architectural design support [2]; qualitative reasoning in engineering design [3], [4], software specification re-use [5], software re-use [6], re-use of mechanical designs [7], fault correction in help desk applications [8], building regulations [9], fault diagnosis and repair of software [10], telecommunication services [11, 12].

Figure 1 we show a sketch of a system that may support knowledge sharing in a *Knowledge Net*. A collaborative agent is from the users point of view coordinating the

knowledge, locally stored or shared. The locally stored knowledge may be cases the user experienced. This knowledge also represents the users experience and if knowledge is accessed outside the users knowledge, the own knowledge is used as filter, i.e. if the user already has own similar experience, there is less need to show some others experience in the same area (if comparison is not the topic, if the user wishes to know how his cases differs from other users approaching a similar problem). The collaborative agent may also handle permissions to access the users knowledge (people in the same network), handle negotiations if costs are involved using/sharing experience.
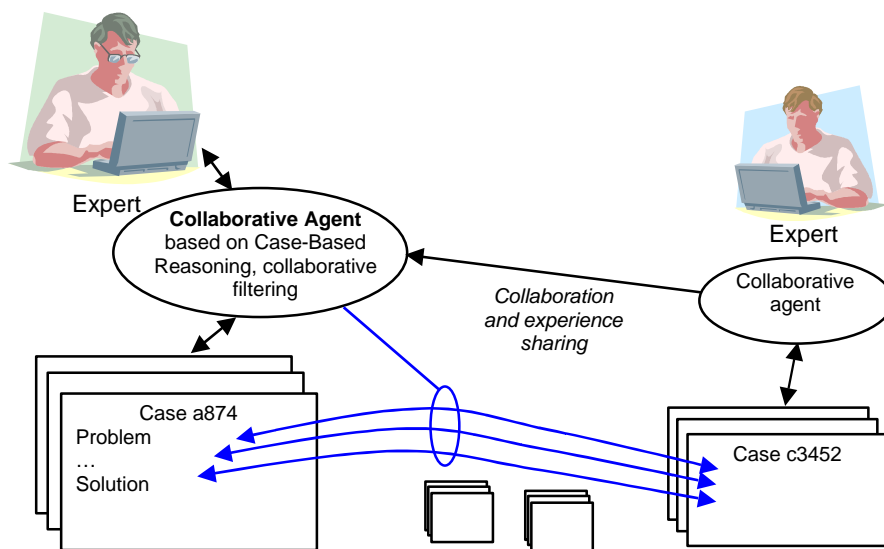

Figure 1. Experience Sharing Environment

3   Conclusions

Networks of collaborating experts is a concept that has proven efficient. Unfortunately there is little computer based assistance for aiding such nets. In the paper we outline an approach where collaborative agents, based on collaborative filtering, collaborative case based reasoning and user models support knowledge sharing networks. Many of the components needed to realize such a system are already available as research prototypes or research projects, but the huge challenge of integrate them and launch them as a collaborative computer added work environment remains.

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