Expertise-Tagging Game: Identifying Expertise Networks in organizations

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1. Introduction

Many computer systems have been built to support expertise finding in organizations. These systems are usually called expertise finders or expertise recommenders [1]. They recommend people who have the sought knowledge to information seekers based on the systems' collections of data that reflects people's expertise. However, collecting data to build expertise profiles for these systems in an organization is a difficult and daunting task.

Early systems usually relied on human's manual work to creating an expertise database, such as asking people to edit their personal profiles, conducting assessment interviews, or using extensive surveys. These methods are usually costly and time consuming. Furthermore, because of the dynamic nature of the expertise networks, these assessments usually become obsolete quickly and are difficult to maintain overtime.

Modern systems use information retrieval techniques to discover expertise from implicit or secondary electronic resources. However, this approach also has many limitations. For instance, Lindgren et al. [6] found that automatic profiling by crawling users' documents in an organizational knowledge base did not provide a satisfactory expertise profile, as users reported the result is incomplete. Furthermore, because of the potential privacy and security concerns, organizations and individuals are reluctant to adopt such approaches.

The best source of information on expertise comes from colleagues and friends. However, the challenge lies in mining that "local knowledge" of expertise data. By engaging people in the process of sharing their knowledge of others' expertise, a robust expertise finder can be built. Our key problem is how to engage people in continually creating and updating expertise profiles for themselves and their colleagues. Inspired by Luis's work in ESP game [2], we designed a social game, called Expertise-Tagging Game (E.T. Game), which targets to engage people to contribute to expertise profiling with fun. In this paper, we first briefly describe our system design, and then discuss the result of a pilot study.

2. Expertise-Tagging Game

E.T. game is basically a variation of Output-agreement game discussed in [2]. The basic winning condition is that a user gets certain points when the user's input matches with other users' input. The nature of the matching game encourages users to tag accurately.

Figure 1 shows the tagging interface of the E.T. game.

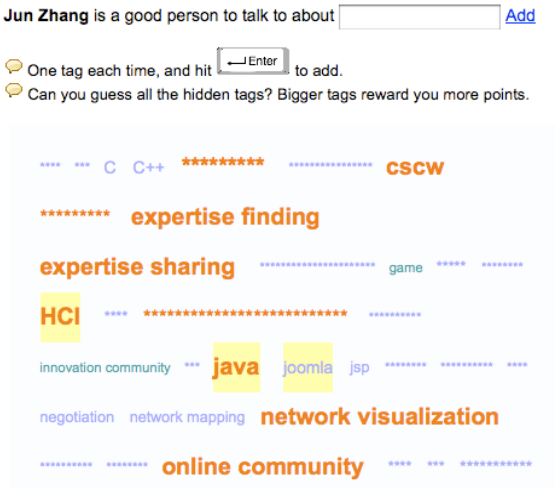

Figure 1: Tagging game Interface

A person's expertise tags are presented in a masked tag cloud when the game starts. A user starts playing this game by typing a keyword in the text field following "John is a good person to talk to about _____" once a time. If a tag he sent matches a tag input by that individual or by other users who have played the game, the matched tag is revealed and the user earns some points based on how many other people have also tagged the same keyword. The goal of the player in the game is to reveal all the masked words in the tag cloud.

A point and level score system is designed to track users' playing histories. Top players are named as "top connectors" in the landing page of the game site. Top players for a specific game are also listed in that game's page as "who knows [person name] best". We expect such design will bring in some competition for those people who want to establish a reputation as social connectors in the organization.

In addition to the tagging functions, we also developed a network visual-exploration interface that helps people discover the expertise networks around them. After revealing the masked tags in the game, users can dynamically explore the visualization to find out relationships like who shared those similar expertise tags, and who have tagged whom.

3. Data Analysis

We deployed the system in a 90 person research unit of a Fortune 500 company. Within 3 weeks, 53 users have logged into our system. 41 of them tagged at least one person, and total 67 people are tagged. And 32 users have tagged themselves. Totally 2306 tags were collected and 883 of them are distinct tags. These numbers indicate a high participation rate.

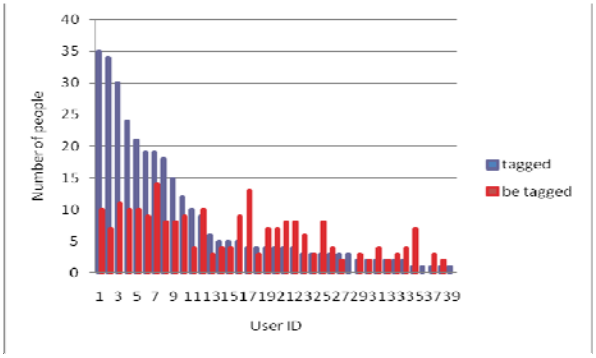

Figure 2: participation distribution

Figure 2 shows the patterns of how people tagged and being tagged. From the figure, we can see that the game already attracted some dedicated players. For instance, the top player has tagged 35 people. We found that top 5 most active players have tagged 80% of the users in the community. This result indicates that with a few active players, we can start building an expertise database for the whole organization quickly.

The most popular "taggee" was tagged by 15 different people. We could not find the significant correlation between number of people one tagged and being tagged. This indicates the popularly known experts may not be the top connectors in the organization.

We also conducted a social network analysis on the network of who have tagged whom, which is shown in Figure 3. The network has 70 nodes, 254 edges. From the figure, we can see that several center nodes connect the majority of the network. However, at top left, there are five nodes which are only connected to the rest of the network through one node. These five nodes are a five person group which just joined the business unit recently. This network visualization shows another benefit of expertise tagging game: it not only collects expertise data, but also reflects the network structure in which knowledge is shared and sought.

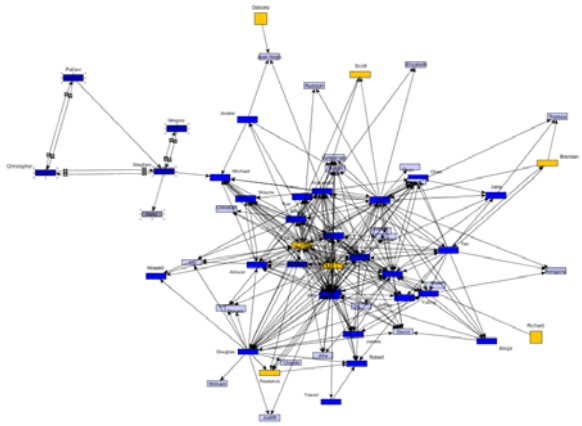

Figure 3: The The tagging network

Among 254 edges, there are 56 (22%) of them are mutual edges. A triad census [5] confirms that such high ratio of mutual edges in this network is not random. This indicates that there are reciprocities in tagging.

We also interviewed users to better understand their motivations and experiences in participating. From the interview, we found that a lot of users were motivated by different fun factors in playing the game, such as enjoyment of problem solving (revealing the tag cloud) and competition (being a top connector). However, several senior users expressed concerns of deploying a game into a corporate environment, as workers have an expectation of productivity. Thus, instead of positioning the system as a game, after the first stage pilot, we positioned it as a system for people to recognize their colleagues (by recommending their expertise using tagging) as well a means of self-expression (by self-tagging and approving peers' tags). This positioning places the system in the context of the work environment, while still allowing for fun. This change was welcomed by almost all the users.

Above all, the pilot study indicates that our design is a promising method of gaining long term engagement for people to reveal the organization's expertise networks. For next step, we are going to deploy the system into a larger scale of user in the company to further study it.

4. Reference

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