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Social Networking based on Language Exchange site in Mobile Learning Environment

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Abstract: This paper proposes a social networking site based mobile environment for learning foreign languages called SONLEM, which encourages learners to find a partner who can solve their language learning problems through an online community, and an appropriate request chain of friends that can provide recommendations upon request. The learner can practice their second language with a native speaker who is learning their language.

Keywords: Mobile learning, SNS, foreign language learning.

Introduction

In recent years, participation in online Social Networking sites like MySpace, Facebook and Mixi is very popular for young people. All of these services allow users to create online profile and share personal information with friends. The Social Networking Service (SNS) has got a lot of attention. The SNS is defined as a service that "allow(s) individuals to present themselves, articulate their social networks, and establish or maintain connections with others" [1] or "a site that allows users to create individual profiles in hopes of making contact with other site users that share similar interests or goals" [2]. The number of people who are interested in using the SNS is growing quickly from 2006 to 2010. Users use it to write the diary, read and comment the others' diary to communicate together.

Moreover, using the mobile devices such as mobile phone, PDA, iPad, we can access the Internet by the wireless at the University, Airport, Office, Station, Family, etc. The rapid advance in broadband and wireless Internet technologies has promoted the utilization of wireless applications in our daily lives. In the meantime, a variety of embedded and invisible devices, as well as the corresponding software components, have been developed and connected to the Internet wirelessly [3]. All of these technologies have given birth to the Mobile Learning field, Mobile Learning is increasing worldwide.

We propose a collaborative learning SNS based mobile learning environment for language exchange and call it SONLEM (Social Networking based on Language Exchange site in Mobile learning environment). This is a Mobile Assisted Language Learning (MALL) system. The benefits of m-learning in language education have been widely documented [4, 5].

The SONLEM environment supplies learners to study the second language. It allows the members to find foreign language partners, practice their foreign language with native speakers. The partners can help problem-solving each other. So it enhances cooperation between learners. It also encourages sharing their knowledge, interacting, collaborating, and helping each other. The SONLEM environment is a website for language exchange and international communication.

For example, Takahashi is Japanese and he is studying Chinese. Takahashi wrote a blog in Chinese and wanted somebody to correct it for him, so he input the keyword "Language Learning, Chinese" and search for it on the system, and then the system discover the people who are related to the keyword and recommended the appropriate CF (Chain of Friends) for Takahashi.

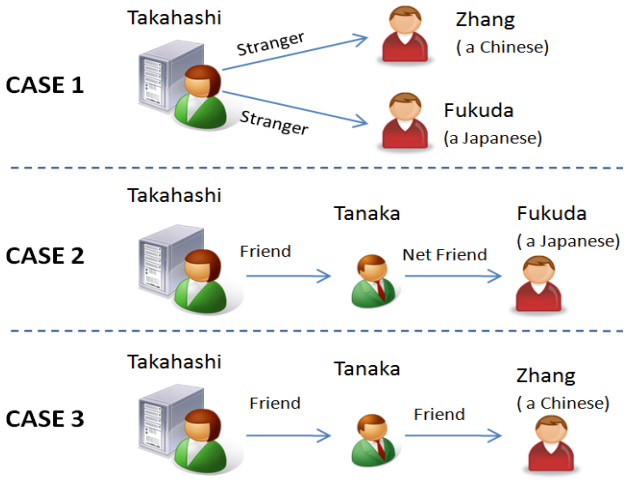

Figure 1. Request CFs.

As shown in the Figure 1, Zhang and Fukuda can speak Chinese, Fukuda is a net friend of Tanaka, Zhang is a friend of Tanaka, and Tanaka is a friend of Takahashi. There are 3 Request CFs:

For the case 1, Takahashi asks for the help to Zhang or Fukuda. But as there are no acquaintances between them, it is difficult that he gets help from Zhang or Fukuda.

For the case 2, Fukuda is a net friend of Tanaka and he is a Chinese learner.

For the case 3, Zhang is a friend of Tanaka and Chinese is his mother tongue.

Comparing the case 2 with the case 3, the system recommended the case 3 for Takahashi. Then Takashi asked Tanaka introduce his friend Zhang to him.

In the SONLEM environment, it is supported that each learner has a mobile device connected to the Internet through wireless connection. We make the system can be accessed not only by personal computers but also by mobile devices such as PDA, iPod/ iPad, mobile phone, etc.

1. Relevant Research

There are many "language exchange" SNS sites for learning such as "Lang-8" (http://lang-8.com/) and "Italk" (http://www.italki.com/). "Lang-8" and "Italk" are SNS sites for language exchange. Using these two sites, you can write in the language you are studying, and the others (whose mother tongue is the language you are studying) will correct your diary. And you can correct the diaries for them who write diaries in your mother tongue. You are able to not only learn a language, but teach others your own language as well.

But the "Lang-8" and "Italk" only offer a social networking platform to help each other. The author of this paper is a Lang-8 member. He wanted to make friends with the people whose native language is English and sent messages to them, but nobody replied his messages. He wrote two diaries on the Lang-8 in English, wanted somebody to correct his English, at the end nobody corrected them for him. So, it is difficult to get help from strangers.

PeCo-Mediator is a system to seek for capable cooperators through a chain of personal connections (PeCo) in a networked organization [6], the experimental results of the system show that the PeCo-Mediator system facilitates users' encounters with cooperators and develops new helpful connections with the cooperators.

The SONLEM environment not only offers a social networking platform to help each other, but also helps learners to find out a language learning helper. Beyond simply looking at who is connected to whom, the SONLEM environment can indicate the strength and direction of a relationship.

The relationship is friends or acquaintances on the SNS. A novel approach using this relationship helps learners to find an appropriate person who is able to solve the problem even if he is a stranger, an appropriate request CF will be recommended upon their request, and then they help each other through the SONLEM environment. In this way it can enhance personal relationship, expand network of friendship, and support knowledge sharing and knowledge creation.

The SONLEM environment is a mobile learning environment. For example, a foreigner in a restaurant of Japan, cannot understand the menu of Japanese, so he uses the mobile phone takes a picture of the menu and updates to the SONLEM environment. Then a friend in the bus gets the message by mobile phone, helps him to translate it and the problem is solved.

2. Language exchange

Language exchange is a method of language learning based on mutual language practicing by learning partners who are speakers of different languages. (http://en.wikipedia.org/wiki/Language_exchange). It is two or more people who speak different languages practicing each other's language.

In a language exchange, learners practice more than in a class, talking with native speakers of the language they are learning. In a class, there is very little time to practice speaking, because a lot of time is spent on instruction and the class may have too many learners to give everyone enough meaningful practice. That means learners are not used to listening to native speakers and may not be able to understand them. A language exchange with native speakers is a good way to improve your language skills. It is also help to learn the real spoken language of the culture, informal expressions and slang.

It is very important to encourage not only individual learning but also collaborative learning in order to augment practical communication among learners and accumulation of the expressions. The SONLEM environment can employ Computer Supported Collaborative Learning (CSCL) that focuses on the socio-cognitive process of social knowledge construction and sharing based on social interaction [7]. This paper describes the design and the implementation of the SONLEM environment.

3. The SONLEM Environment

When a learner faces problems in daily life learning, he will searches the answers on the Internet using search engines, such as Google, Yahoo, etc. The problem is, however, there are lots of irrelevant answers. The learner needs the answers that are believable and trustworthy.

In SNS, the members not only have direct personal relationships such as friends, but also have indirect personal relationships such as friends of friends, so the members of the SNS have mutual trust and closeness. According to this characteristic, as a SNS member, a reliability answer can be expected. A new problem is how to find the appropriate person to solve the problem.

3.1 Find the appropriate person

In order to find an appropriate person who can help the learner to solve his problem, learner has to be aware of other person's profile, interest and past actions [8]. In this language learning system, the profile includes members' mother tongue, second language and language they are learning.

The language abilities are classified into four levels: "Beginner", "Intermediate", "Advanced" and "Native". Beginner is a person whom is just learning the language. Intermediate is a person whom knows simple words and sentences and are learning more intricate grammars and creating longer sentences. Advanced is a person whom can speak semi-fluently and have a large base of vocabulary. Native is a person whom is a native speaker of that language.

At first, the learner should write some keywords about the problem and search for it on the SNS. Then the SONLEM will discover the person who can effectively solve the problem through their profile. Their profile includes their action history and personal information. Finally a recommendation is made about the appropriate person to who can best aid the learner.

There is a formula for calculating the appropriate degree. Consider that n is the number of the keywords that the learner input, and compare with the other person's profile, interest and actions, the number of the matched keywords is nm. It is assumed that the Level of Matched Keywords (LMK) is calculated as follows:

$$\left(LMK = \frac{n - n_m}{n} \right) \quad \text{, where} \quad 0 \le LMK \le 1$$

In case of LMK value is equal or close to zero, then the person will be recommended as an appropriate person who is close to the learner's request.

Only finding the appropriate person is not enough, in case the person is a stranger for the learner, how to get help from him?

3.2 Recommend an appropriate request CF

When a learner needs to ask for help from the stranger, the SONLEM environment is able to advance the learner an appropriate CF, and then the learner contacts the stranger for help tracing the CF.

In case that there are many CFs, the SONLEM environment recommends the best CF according to the strength of the personal relationship and the length of CF.

3.2.1. Strength of Personal Relationship (SPR)

As we know, the personal relationship is different in SNS. Some personal relationships are very close: They are friends, family members, colleagues, etc, they have a direct contact, such as contact in person, by telephone, by emails or by letters. Other personal relationships are unfamiliar: They are strangers, and they have no personal contacts.

In PeCo system, the strength of personal relationship is estimated by the degree of frequency of e-mail exchange. In SONLEM environment, the personal relationship is classified into five levels based on the SPR. Level 1 is an unfamiliar relationship and level 5 is an intimate relationship.

Level 1: Strangers are persons whom the learner has never met before.
Level 2: Slight acquaintances are persons whom the learner has never met before, but has talked for many times, such as net friends.
Level 3: Close acquaintances are persons whom the leaner has met and talked with him for many times.
Level 4: They are friends or close friends.
Level 5: They are family members or relative.

Moreover, for the net friend, the level will change automatically according to the frequency of the helping each other and the visited times.

Before using the SONLEM environment, the learner should find the friend and preset the level of the personal relationship.

There is a formula for calculating the SPR. Consider that n is represents the level of the personal relationship which was set by the learner before. It is assumed that the SPR is calculated as follows:

$$\left(SPR = \frac{5-n}{5} \right), \text{ where } 0 \le SPR \le 1 \text{ and } n = \{1,2,3,4,5\}$$

In case of *SPR* value is equal or more close to zero then the personal relationship is more intimate, and *n* is a natural number from 1 to 5.

3.2.2. Length of CF (LCF).

"Length" means the numbers of the intermediaries in the CF. Milgram conducted several experiments to examine the average path length for social networks of people in the United States, he found that anyone can be connected to any other person through a chain of acquaintances that has no more than five intermediaries. The experiments are often associated with the phrase "six degrees of separation" [8].

Six degrees of separation refers to the idea that, if a person is one step away from each person they know and two steps away from each person who is known by one of the people they know, then everyone is an average of six "steps" away from each person on the earth (http://en.wikipedia.org/wiki/Six_degrees_of_separation).

According to the "six degrees of separation" theory, we can know a social network typically comprises a person's set of direct and indirect personal relationships, and the length of the CF is no more than six persons. So we get a formula for calculating the *LCF*. Consider that n is the number of the persons in the CF.

$$\left(LCF = \frac{n}{6} \right), \text{ where } 0 < LCF \le 1, \text{n} = \{1,2,3...\}$$

In case of *LCF* value is more close to zero then the number of the persons is smaller, and *n* is a natural number.

3.2.3. CF Adequacy (CFA).

The CF should not be only the small number of the persons, but also with a close relationship between these persons. It is the conditions to determine whether the CF is appropriate or not.

Consider that n is the number of the persons in the CF, m_k is level of the personal relationship for the person k. Merge two formulas (*SPR* and *LCF*) into one formula, and we get a formula for calculating the *CFA* in the following:

$$\left(CFA = \sum_{k=1}^{n} \left(\frac{k}{6} * \frac{5 - m_k}{5} \right) \right), \text{where } 1 \le m \le 5,\ n = \{1,2,3...\}, \text{ and } k = \{1,2,3...n\}$$

In case of *CFA* value is more close to zero then the CF is more appropriate, n is a natural number, and k is a natural number from 1 to n.

3.3 Facilitates collaborate learning

This environment also relates to the collaborative learning pedagogical theory. "Collaborative learning" is an umbrella term for a variety of educational approaches involving joint intellectual effort by learners, or learners and teachers together [10]. Collaborative learning encourages knowledge sharing while making use of the learner's physical context and mobility.

The SONLEM environment facilitates the members' collaborative learning. It supports members to help each other, and the helping history will be recorded. If Learner A helped Learner B, then Learner B asks help from Learner A will become easily, because they are no longer strangers. So the network of the friendship is expanded according to the frequency of the helping each other.

4. Implementation

We used wireless LAN (IEEE 802.11b), Tomcat 5.0 as the server and ran it on the CentOS5.0, used Java to develop the SONLEM environment. The Database schema is designed and implemented using PostgreSQL in order to store all learner profiles, learner actions, messages and information etc.

As mentioned above, while a learner uses the system, he should preset the level of the personal relationship. As shown in the Figure 2, it is the interface for setting personal relationships. The learner inputs the information of his friends, family or someone else, and then searches on the system. A list of the search results will be displayed on the page. The learner selects the person in the list and set the level of the personal relationship.

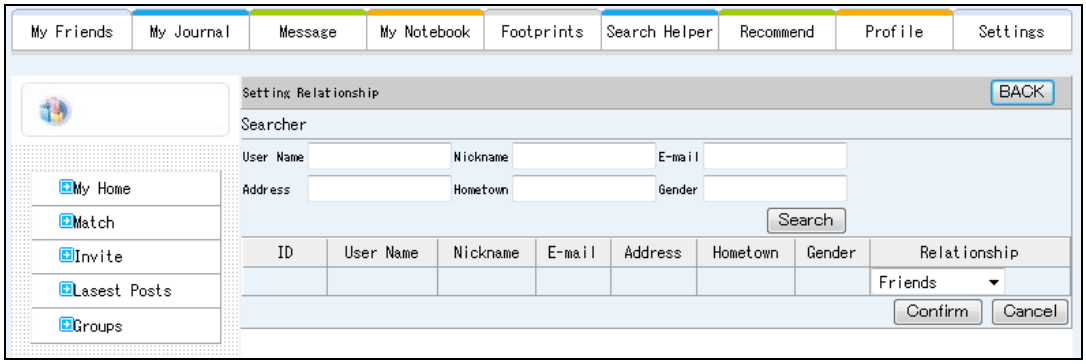

Figure 2. setting of the personal relationship.

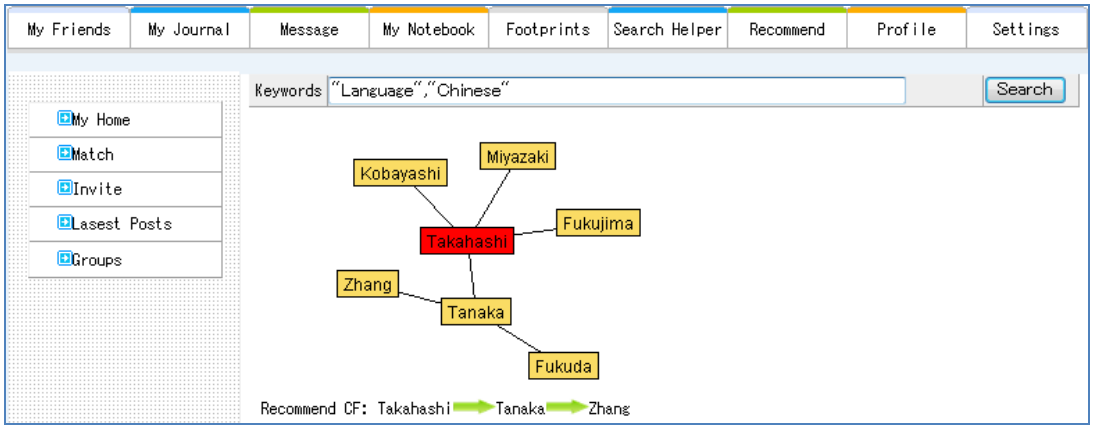

Figure 3. Appropriate request CF.

The learner uses the Figure 3 to find an appropriate person. He inputs the keywords about his problem and searches it on the system, and then a personal graph will be displayed. At the same time a "Recommend CF" will be recommended for the learner on the bottom of the page.

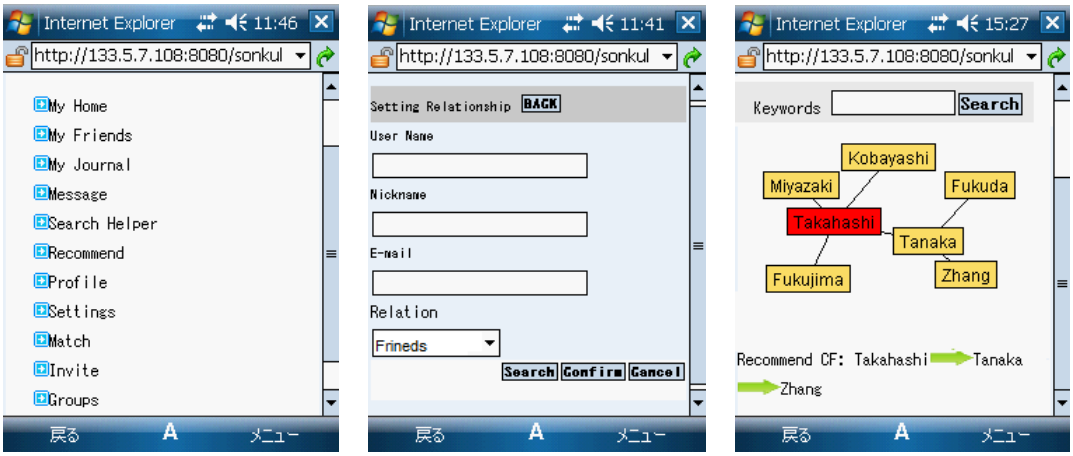

Figure 4. PDA.

The Figure 4 shows the interfaces on the PDA.

5. Conclusion and Future work

In this paper, we proposed the SONLEM environment for language exchange, and the point is it supports learner to get help from other SNS members, at the end makes them help each other. They have the same interest, purpose and consideration, it is easy to make friends and a longstanding friendship is expected.

This system is to enhance learning chance. The SONLEM environment is also very beneficial to be taught and corrected by a native speaker of the language you are studying. A language exchange is more effective than the other popular ways to practice a foreign language. By using the SONLEM environment, users can teach and learn languages as well as have international exchanges with each other.

For the future work, we will open this system to the public and evaluate it.

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