19th International Conference on Knowledge Based and Intelligent Information and Engineering Systems

Communication Support System for Enabling Group Management of Community Units

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Abstract

In this paper, we propose a system that enables smooth communication by online management of interpersonal relations in community units such as those based on hobbies, clubs, and university classes. Communication without various intermingling interpersonal relationships is enabled by making groups in community units of various sizes and forms. It is also possible for each group to set up its own username and profile, and display its own information and exchange messages with a select audience. Through a six-day usage experiment, the participants’ ability to retain their own characteristics and to comment freely and communicate smoothly was verified. As a result, we concluded that this system could be used for communicating without mixing multiple non-related interpersonal relationships by setting up groups.

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Keywords: Online communication, Social networking service, Interpersonal relations, Grouping, Persona.

1. Introduction

Online communication system such as e-mail, a chat system, a remote meeting system, and a distance learning, becomes a common tool for people. Now we can communicate using SNS not only with acquaintances but also with the people who they have never met in the real world. SNS is a service to support to build a new relationship with friends or unfamiliar persons, and to communicate them through a profile, a diary and a message exchange.

While SNS enables users to communicate freely with a wide variety of people on the Internet, there are an increasing number of users who are tired of unintended connections and problems arising from social-media harassment\textsuperscript{1}. In this paper, we propose a system that enables smooth communication by online management of human relations in community units such as those based on hobbies, clubs, and university classes. The system allows users to create various community groups according to the above relationships as a communication unit size, so that the system makes it possible to communicate without mixing a variety of relationships. In existing services\textsuperscript{2,3,4,5}, users can create and manage a group or a list. However, these services don’t provide a function that allows the setting of different

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user names and profiles for each group to a user who has only one account. Therefore, ‘a strict and reticent senior student’ may vary to ‘a man who frolics to take pictures with an animal costume in a theme park’ on SNS. In contrast, our system enables to set user names and profiles for each group, and to perform publishing own information and exchanging messages by selecting target users and groups.

This paper is organized as follows: in section 2, we will describe the problems about existing systems to support online communication focusing on interpersonal relationships. In section 3, we explain how our system supports managing online interpersonal relations in community units. We will show the experimental result on constructing real-life relationships using our system in section 4. Finally, we will discuss some conclusions and our future steps in section 5.

2. Related works on support systems of online communication

2.1. Problem on interpersonal relationships in SNS

Along with the increase in the number of SNS and microblog users, there has been an increase in unintended links with people using SNS and mixing of people from various communities. As a result, the issues of limits on disclosure of information and comments or effects on actual interpersonal relationships have been pointed out. The fact that the diversity of actual relations between people cannot be reflected by a system has been raised as a cause for people becoming tired of relationships originating on SNS.

Both in the real environment and on the SNS, people often show different characters or personas to others depending on the friendship. For example, correspondence and conversation contents are usually different for family, senior students of a club and friends with a common hobby. However, when multiple relationships are mixed in one place, it is difficult to perform a smooth communication while maintaining character properties. Many users feel that they cannot post messages freely because they should consider the position of the receivers who have different hobbies and diversions and they should keep the appearances for their boss or old friends.

2.2. Related research on communication support system

Nakakoji et al. focused on the features of interaction channels, which are connected to elements of the technical, emotional, and social aspects of communication in services. They pointed that a user uses a real name or a handle name differently according to privacy, security, and identity, and names may play a much more powerful role than those issues. Cosplay chat is the one of the systems that supports online chat by allowing users to deal with multiple handle names in a single chat session. The participants freely express their opinions because of they do not have to pay much attention to maintain constraints of the social relationship in the group. However this system intends a single chat and users can not set and present their detail profile other than user names. In the communication on SNS that a variety of interpersonal relationships is followed continuously for a long period of time, the function is required that users can express easily and clearly their characters to other users based on each community.

A method of limiting access by forming friendships into groups and narrowly setting the scale of information disclosure is proposed to resolve this issue. The proposed system enables setting access limits by group and contents by the transmitter of the information by classifying friends into groups. However, this method alone cannot completely prevent the intermingling of friends from multiple communities, and it is difficult to maintain the changing personal characteristics for each friendship.

Therefore, the system is needed to enable re-creation of actual, fluid human relationships on a system by the easy creation of groups and supports smooth communication without mixing relationships by making multiple completely independent groups.

3. System Overview

3.1. Design Policy

On the basis of the discussion in Section 2, we outline the system design policy as follows:
1. Flexible group setup and management functions
   The system has an interface that allows for flexible and easy group setup and member management and enables expression of actual, fluid interpersonal relationships.

2. IDs and profile messages that can be set up for each group
   It is possible to set up user IDs and profile messages for each participating group. As a result, the proposed system supports maintenance of characteristics that change regularly depending on interpersonal relationships.

3. Function to simultaneously post to multiple groups
   Even when a group, for instance, a group of members of a certain club, is set up in line with the actual conditions, groups of senior and junior club members may be included in the club’s overall group. As a result, when posting common issues to the groups that are set up, there is a function to post the same material without switching groups to enable easy management of multiple groups.

4. Independent communication functions for each group
   Information posted using the communication function is completely independent for each group. The burden caused by the scope of information disclosure is reduced by making comments and replies to the posted content independent of each other by forming group.

By adopting such design policies, our system allows a user to maintain his/her character or persona that is expressed in each community and relationship. The profile for each group includes an icon, a nickname and a self-introduction text.
Some existing services also provide various group functions and users can create and manage a group for each relationship. However, users can set up only one profile per account in these services. Because some users act differently in each community, they have various information that they don't want to be known by the other community members so it is difficult to set the detailed profile for one account. In contrast, our system enables to set a profile not for each account but for each group so that users can set up detailed profiles that they want to convey only to the community members. Users cannot find which group the other users participate in, and cannot browse the other user's profile unless they join the same group.

3.2. Framework of web site

Our system consists of three types of pages: the login page, the group select page and the group main pages. Fig.1 shows the system's framework. When a user access the web site, the login page is shown. After logging in, the login page transits the group select page. The user selects a group that the user intends to browse update information. A user can setup a new group on this page.

3.3. System functions

3.3.1. Group setup function

There is a function to easily set up and manage groups to enable communication without mixing personal relations by forming groups by actual interpersonal relationships and friendships. Fig.2 shows the main page of such a group.
On a group main page, a user browses and posts an article to the group BBS. In addition, the group main page includes a list of received messages and links to a diary, a management of group members, and a profile update page.

3.3.2. Function to add users to groups

Users can be added to a group from the group member page. A user ID and a user number are required to add users. Because other users cannot see the user number, it is assumed that it will be exchanged by individual messages or shared in person.

3.3.3. Registering user IDs and profiles by group

It is possible to register different user IDs and profile messages in each registered group in order to retain the characteristics to show to others for each group. A user registers an icon, a user ID, and a message for each group. Fig. 3 shows the profile registration page. A user ID is a nickname and the registered user ID is only valid in that particular group. The registered profile message are shown on the group main page.

3.3.4. Individual message function

The individual message function is used as a person-to-person communication method between users. It is possible to check incoming messages whenever you are logged into the system. The individual message system is independent of the group, and it is possible to send and receive messages to/from someone not in the same group.

3.3.5. Diary and bulletin board functions

The diary posting page is shown in Fig. 4. This is used as a communication method in the group. Users can attach an image to the posting texts in the diary posting page. The bulletin board is used when group members communicate only in text. In the diary page and the bulletin board page, the user ID that was set in the group is displayed as the poster name. To enable free expression, these functions are independent by group, and users of other groups cannot see posts and comments within a particular group. It is also possible to post the same content to multiple groups in one post operation.
4. Usage experiment

4.1. Experiment overview

We performed an evaluation experiment using the system to confirm the possibility of maintaining one’s own characteristics and commenting freely. Experimental subjects were 18 college students. Eighteen male and female university students used the proposed system for six days.

For the first three days, aside from registering in the experiment as one group, the participants used the system without individually being able to set up groups. In the final three days, they used the functions of the proposed system. IDs and passwords were distributed to the participants, and they consented to registering their actual names. After the experiment, they were asked to reply to a questionnaire with evaluations of 1 to 5, with 1 being “strongly disagree” and 5 being “strongly agree.”

4.2. Experiment results

The results of subjects’ responses to our questionnaire are listed in Table 1. Twenty-two groups were set up during the experiment. Questionnaire items (iii) had a median of 2 and a norm of 2, and questionnaire items (iv) had a median of 2.5 and a norm of 2. Further, questionnaire items (v) had low grades, with both a median and a norm of 2. It can be inferred that those making the groups and the users being added to the groups did not feel resistance. There were groups set up for entities such as school year and members of the same clubs, and the ease of the group setup function in making groups and the ability to express actual interpersonal relationships in the proposed system were confirmed.

As shown in Table 1, questionnaire items (i) had a median of 2.5 and a norm of 2 in the first half of the experiment, but the values increased in the second half of the experiment using the group function to a median of 3.5 and a norm of 3. The comments section of the survey had many opinions stating “It was easy to make comments because there were only people with common hobbies and topics” and “I was able to comment freely because the group was just with people I know.” Further, “I wanted to separate comments by group” was stated as a reason for using the function to simultaneously post to multiple groups; therefore, we can conclude that making the communication function independent by group may have raised the level of freedom of expression.
Table 1. The average values of the questionnaire result.

<table>
<thead>
<tr>
<th>Questionnaire item</th>
<th>Experiment</th>
<th>Median</th>
<th>Norm</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) I could comment freely without the registrant’s knowledge.</td>
<td>First</td>
<td>2.5</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Second</td>
<td>3.5</td>
<td>3</td>
</tr>
<tr>
<td>(ii) It was easy to check the posted information.</td>
<td>First</td>
<td>4.0</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Second</td>
<td>3.5</td>
<td>2</td>
</tr>
<tr>
<td>(iii) I felt a physical burden in setting up the group.</td>
<td></td>
<td>2.0</td>
<td>2</td>
</tr>
<tr>
<td>(iv) I felt a psychological burden in setting up the group.</td>
<td></td>
<td>2.5</td>
<td>2</td>
</tr>
<tr>
<td>(v) I felt a burden in being invited or added to the group.</td>
<td></td>
<td>2.0</td>
<td>2</td>
</tr>
<tr>
<td>(vi) The level of ease in commenting for each group increased</td>
<td></td>
<td>2.5</td>
<td>2,4</td>
</tr>
<tr>
<td>because of changing user IDs.</td>
<td></td>
<td>3.0</td>
<td>2</td>
</tr>
<tr>
<td>(vii) The level of ease in commenting for each group increased</td>
<td></td>
<td>4.0</td>
<td>4</td>
</tr>
<tr>
<td>because of changing profiles.</td>
<td></td>
<td>4.0</td>
<td>4</td>
</tr>
<tr>
<td>(viii) I was able to apply my own characteristics to each group by changing user IDs.</td>
<td></td>
<td>2.0</td>
<td>4</td>
</tr>
<tr>
<td>(ix) I was able to apply my own characteristics to each group by changing profiles.</td>
<td></td>
<td>4.0</td>
<td>4</td>
</tr>
</tbody>
</table>


First experiment: The participants were classified into one group.
Second experiment: The participants could use the group function.

Table 2. The number of group members, modified user IDs and modified profiles for each group.

<table>
<thead>
<tr>
<th>Group ID</th>
<th>Member</th>
<th>Modified user ID</th>
<th>Modified profile</th>
<th>Group ID</th>
<th>Member</th>
<th>Modified user ID</th>
<th>Modified profile</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>12</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>02</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>13</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>03</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>14</td>
<td>2</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>04</td>
<td>8</td>
<td>0</td>
<td>4</td>
<td>15</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>05</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>16</td>
<td>4</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>06</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>17</td>
<td>5</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>07</td>
<td>5</td>
<td>1</td>
<td>0</td>
<td>18</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>08</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>19</td>
<td>2</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>09</td>
<td>3</td>
<td>0</td>
<td>2</td>
<td>20</td>
<td>7</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>10</td>
<td>7</td>
<td>3</td>
<td>5</td>
<td>21</td>
<td>4</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>6</td>
<td>2</td>
<td>4</td>
<td>22</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

User IDs and profile setting functions were examined. Table 2 shows the number of set up groups, group members, modified user IDs and modified profiles for each group.

As shown in Table 1, changing user IDs and profiles had no effect on the level of freedom of expression or changes in trends. However, in terms of applying one’s own characteristics, both user ID and profile were evaluated with both a median and a norm of 4. Six out of 18 of the experiment participants changed their user IDs by group. There were ID changes in groups such as those only for the same school year or for users with common hobbies. Fourteen of the 18 participants changed their profile settings depending on the group. The cause of more user profiles being changed than IDs is surmised to be that a considerable amount of information is communicated because the profiles can be easily changed in line with the purpose of setting up the group and are used for more purposes than user IDs. Because of the above results, we could not confirm the effects of user ID and profile settings on comment trends or level of freedom, but they can be said to be useful for maintaining the changing characteristics for each friendship.
During the experimental period, six participants posted the same contents to multiple groups using the simultaneous posting function. Focusing on the participants using the function, three participants answered “it is a topic common to other groups” and two participants answered “I wanted to divide the reactions and the comments in each group”. In contrast, ten participants answered that they did not have to use the function. In order to confirm the usefulness of this function, it is necessary to perform an experiments over a long period of time in situations where multiple nesting of the groups could occur.

5. Conclusion

In this paper, we proposed a communication support system enabling group management of community units. The proposed system has a function for easy online management of fluid interpersonal relationships as they really are in community units to enable smooth communication. It enables the users to display their own information and exchange messages to a select audience without mixing actual relationships.

A six-day usage experiment was conducted to confirm the possibility of maintaining one’s own characteristics and commenting freely. The experiment confirmed that the group setup function enabled easy group formation and that the proposed system makes the expression of actual interpersonal relationships possible. Further, there was an increased level of freedom of expression once the group communication function was made independent for each group.

In the future, we intend to work on decreasing the system operation load and improving the layout to enable easy management of multiple groups. Furthermore, this experiment was performed in small groups in a short period of time. This system is aimed to represent and make manage fluctuating relationships on the system. Therefore, it is necessary to perform a evaluation experiment using the system by participants belonging to various communities over the long time frame.

Acknowledgements

This work was supported by JSPS KAKENHI Grant Number 25330320.

References