CONSUMPTION OF MULTIPLE CONCURRENT IDENTITIES: THE NEED FROM THE INSTANT MESSAGING VIRTUAL COMMUNITY[1]

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ABSTRACT

In recent years, Instant Messaging (IM) has become one of the most growing online communities, reaching millions of users at home and at work worldwide. As the community expands, assuming more than one identity at the same time becomes a common behaviour of IM users. This paper reports our ongoing research on support for multiple concurrent identities (MCI's). Our study used an online survey and face-to-face interviews to identify user needs in supporting MCI's in IM. The study has identified five themes including single nickname, multiple avatars, multiple statuses, boundary control and interoperability. Reflecting on these themes, we propose a framework of MCI support in IM.

Keywords:

Instant Messaging, multiple identities, virtual community, avatars.

INTRODUCTION

The scale of computer networks has expanded rapidly over the past thirty years. Hundreds of millions of PC users are now connected in varied networks including the Internet. Solidly, computer networks have become one of major channels facilitating human communication. They broaden the temporal and spatial dimensions of human connectedness to the level of anytime-at-anyplace connectivity, and increase the number of ways in which people can connect with one another. In addition to the support for fast, ongoing conversations between people, computer networks also foster new social spaces, called *virtual communities* or *online communities* (we use these two terms interchangeably henceforth) (Harasim 1993, Smith and Kollock 1999).

The concept of virtual communities has described variedly by different people in different context (Preece 2000). One of the earliest and most well-known definition of virtual communities was coined by Rheingold (1994), he described virtual communities as "*cultural aggregations that emerge when enough people bump into each other often enough in cyberspace*" (p57). In the past twenty years, there has been an increasing number of virtual communities, where different degrees of online interaction such as making friends, exchanging ideas, acquiring knowledge, entertaining, etc. take place (Jones 1998, McCaughey and Ayers 2003, Preece and Maloney-Krichmar 2003, Renninger

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and Shumar 2002, Rheingold 1993, Turkle 1996). Online communities are formed by many means of computer-mediated communication such as electronic mail (e-mail), Bulletin Board Systems (BBSs), Multi-User Dungeons (MUDs), Usenet newsgroups, Internet Relay Chat (IRC) and World Wide Web (WWW). Every time people send e-mails to other people, post messages to bulletin boards or browse Web pages, they are part of online communities.

> "*It's like having the corner bar complete with old buddies and delightful newcomers… except instead of putting on my coat, shutting down the computer, and walking down to the corner, I just invoke my telecom program and there they are. It's a place.*" Rheingold (1993) describes his MUD virtual community.

Virtual communities are relatively open playgrounds where members can assume many identities for different purposes such as adapting themselves to the community or accomplishing their playing roles (e.g., lurkers or posters) (Nonnecke et al. 2004). People can be whoever they want to be such as of the opposite sex, different races, having higher status (e.g., through a work occupation), lacking or having a disability, etc. (Donath 1999, O'Brien 1999). Some people build their identities based on their true personality, while others create online identities with the hope that their online characters will help developing their characters in real life. Furthermore, similar to real-world, in an online community a person may have different virtual identities, and it is likely that other members in the community may not know all identities of that person.

> "*I'm not one thing, I'm many things when I'm MUDing*" (Turkle 1996).
> "*I have three or four personae myself in different virtual communities*" (Rheingold 1993).

Owing to the absence of physical appearance in online communities, changing and switching virtual identities are often easier than in the physical world. Few keystrokes can easily lead to the termination or creation of virtual identities. Thus it is a common practice that people assume more than one identity in virtual communities. For example, IRC users register several nicknames to participate in different IRC channels; BBS users use different nicknames to send postings to different boards. Supporting multiple identities is, therefore, essential for conducting interactions in virtual communities.

This paper reports our ongoing study of support for *multiple concurrent identities* (MCI's) in one particular virtual community, i.e. the *Instant Messaging* (IM) community. When using the term MCI's, we refer to a user's consumption of many identities *at the same time*. Also, within the scope of this study, we are not concerned with the issue of identity deception, which has been examined comprehensively elsewhere by Donath (1999).

The remainder of the paper is organised as follows. The next section introduces the IM virtual community and examines support for MCI's in current IM. Section 3 describes the study by detailing an online survey and face-to-face interviews. Section 4 reports the results of our study regarding five emerged themes of single nickname, multiple avatars, multiple statuses, boundary control and interoperability. Section 5 discusses possible solutions for the five issues, and presents our proposed framework of MCI support. Finally, we conclude the paper by recapitulating the findings of our study and presenting a view of future research and development.

MULTIPLE IDENTITIES IN INSTANT MESSAGING

In this section, we first quickly introduce IM and how the technology has been used in different locales (e.g., home and business). Then, current support for MCI's in IM is examined.

IM: A Growing Virtual Community

In the early days of IM, it was largely used as a text-based messaging service for teenagers' chitchat, increasingly many features such as voice chat, webcam, emoticons, avatars, etc. have been added to IM. Today, both text-based and multi-media messages (e.g., audio, video and graphic contents) are exchanged over IM networks. IM users are no longer limited to teenagers, millions of home users and business users are now members of the IM community.

The population of IM home users increased 28% from 42 million in September 2000 to 53.8 million in September 2001 (Perera 2001), and enterprise IM is growing at approximately 20% annually (Shukla 2003). As an example, research shows that 77% of IBM employees say that IM has enhanced their way of communication by lessening the time they often spend on e-mail, telephone and face-to-face communications. More than 80% of employees at IBM say that the technology has made their job easier. In addition to that, more than 75% of IBM's clients, who have IM, acknowledge that IM has enhanced their productivity (Shukla 2003).

Of late, there is a large body of research on IM (Grinter and Palen 2002, Handel and Herbsleb 2002, Isaacs et al. 2002, Nardi et al. 2000). Those studies mainly investigate the adoption of IM in a particular cultural group. For example, Grinter and Palen (2002) examined IM's support of interpersonal communication amongst teenagers. Nardi et al., Handel and Herbsleb, and Isaacs et al. explored the use of IM in the workplace. Those studies have shown varied evidence of how IM has been used effectively to support people's work. The ethnographic study conducted by Nardi et al. identified different uses of IM in the workplace such as broadcasting information, negotiating availability, switching media, etc. Handel and Herbsleb's analysis of message content showed that there was a significant use of chat in facilitating work discussion and group coordination. Unfortunately, to the best of our knowledge, no research to date examines support for multiple identities including MCI's in IM.

Support for Multiple Concurrent Identities in IM

As IM becomes popular, it is possible that one user uses IM in different domains (e.g., domestic and commercial) for many purposes under different identities. For examples, previous research (Handel and Herbsleb 2002) has shown that people in the workplace often participate in many different groups. Hence, there is a need for supporting MCI's in IM. The current framework of MCI support in IM is that *one username carries one virtual identity*. This framework is used by four most popular IM networks including AIM (American Online Instant Messenger), ICQ or 'I Seek You' (ICQ Inc.), MSN (Microsoft Service Network Messenger) and Yahoo (Yahoo! Messenger). Currently, IM users assume MCI's by registering usernames with one or many IM networks. When a user enters the IM community, this user can take on many identities simultaneously by logging into different IM networks with different usernames. For example, a user can have two Yahoo usernames and three MSN usernames; s/he can log into both Yahoo and MSN networks simultaneously using two usernames—one Yahoo and one MSN.

In addition to that, current IM does not support different settings for different people in a user's messenger list or buddy list. That means the user's setting appears the same to all people in the buddy list. For example, a Yahoo user customises her/his status as '*Boo, I miss you*', then everyone in the user's buddy list sees the same status.

As Turkle argues, the self in cyberspace is fragmented and multiple, but "*multiplicity is not viable if it means shifting among personalities that cannot communicate...How can we be multiple and coherent at the same time*?" (Turkle 1996, p258). Putting this argument in the context of IM, identity multiplicity is supported in current IM. The users can create many identities by registering different usernames with many IM networks. However, there is no coherence between many identities of a user. Moreover, IM does not provide a platform that supports flexible switching between a user's identities. In summary, the current framework of MCI support in IM encourages multiplicity of identities, but highly limited in facilitating communication between a user's identities.

THE STUDY

This section describes our study of IM, which is composed of an online survey and face-to-face interviews. The survey covered many aspects of IM such as awareness information (e.g., displaying users' local time and users' physical location), emotional support (e.g., customised emoticons), identities (e.g., avatars and statuses), and privacy (e.g., live video and live audio), etc. However, in this paper we only report the results in relation to the issues of MCI's. Whilst the purpose of the survey was to gain a broad understanding of the use of IM including how MCI's are currently assumed in the IM community, the interviews were conducted to get a deeper understanding of MCI assumption in IM.

Online survey

The online survey consisted of demographic multiple choice questions, 7-point Likert scale questions and open-ended questions[2]. Examples of questions in the survey included: demographic questions (e.g., "*When do you often set your status online i.e., available or visible*"); Likert scale questions (e.g., "*I want to set different statuses for different people in my buddy list*" and "*I don't want to know geographical locations of other people*"); and open-ended questions (e.g., "*What other features do you want when using Instant Messengers*?").

173 participants[3] took part in the survey. The participants comprised of 56 females (32%) and 117 males (68%). In this study, we did not aim to study the different uses of IM between males and females, hence we set no gender balance target, and as the nature of online survey we accepted responses as they came. The participants were students from several universities in Australia and most of them (75%) were in their early twenties. One requirement of our survey was that participants must have used IM for at least 3 months. Most of the participants used IM regularly: 35.1% used IM many times per day, 32.4% used few times per day and 23.1% used few times per week.

Face-to-face individual interviews

After finishing the survey, we were interested in knowing more about the participants' use of IM, so we conducted further informal face-to-face interviews with 6 participants including 2 females and 4 males, who were selected from the 173 participants of the online survey. Similar to the online survey, we did not set gender balance target for our interviews. The six participants were chosen based on a first-responded, first-selected fashion.

Open-ended questions were used in the interviews. The questions were chosen based on the results of the online survey. For example, the participants' responses to the needs for different statuses and

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[2] The list of all questions used in the survey is included in Appendix A of the paper. As mentioned earlier, not all questions are related to the issue of multiple identities.

[3] Some participants did not answer all questions, thus the number of valid respondents vary amongst questions.

avatars (as reported in the next section) came out strongly in the survey. Hence, in the interviews we focused asking the participants questions about their current uses of statuses and avatars, and what support they wanted from IM in relation to the two issues. Examples of questions used in the interviews are "*Can you tell me about your use of avatars*", "*Why do you use avatars?*" and "*Why do you want to use different avatars?*".

The interviews were informally structured. In the interviews, apart from the pre-chosen open-ended questions, we also asked follow-up questions based on the participants responses. We found that technique really useful for the study. As an example, one of our finding (i.e., the issue of single nickname) though was not anticipated by us before the interviews, it emerged strongly from the interviews, as described in the next section.

RESULTS

The study overall yielded much data which we are still analysing. This section reports preliminary results that mainly look at trends of the respondents' beliefs and usage. Five main themes have emerged from the study: single nickname, multiple avatars, multiple statuses[4], boundary control, and interoperability.

Single Nickname

Members of the IM community recognise one another from their nicknames[5]. A nickname can be edited by the *owner* or *other members*; thus members' nicknames can be the same or different from their IM usernames registered with IM networks. In some IM systems like MSN and ICQ, the users are allowed to edit their nicknames to what they want to be seen by other members, and others cannot modify those nicknames. For example, if a user creates a nickname as '*Dark angel*' then appears as '*Dark angel*' in other people's buddy lists, and they are unable to alter that nickname. However, other IM systems like Yahoo take an opposite approach by letting IM users to edit how they want to call people in their buddy lists.

This issue of single nickname was not covered in the online survey, but arose from the interviews. All six participants of the interviews found the method of managing nicknames used by MSN and ICQ very inconvenient. As stated by one participant "*MSN list is very annoying as it makes so difficult to find people. Many times, I want to look for a friend [in the buddy list] but I don't know who is who because my friends often change their nicknames. I have to go through the entire list and check their email addresses to find the one I am looking for*". The study found that allowing IM users to edit their nicknames freely causes inconsistency in other users' buddy lists, hence providing a single nickname is a viable approach in supporting MCI's.

Multiple Avatars

Our respondents found avatars interesting and useful. All respondents like avatars and use

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[4] For short, we use terms multiple avatars and multiple st[...] multiple concurrent statuses henceforth.

[5] In this paper, we distinguish between a user's *usernam[...] user selects when registering with an IM network, wh[...] network. In some cases, the username and nickname ca[...]
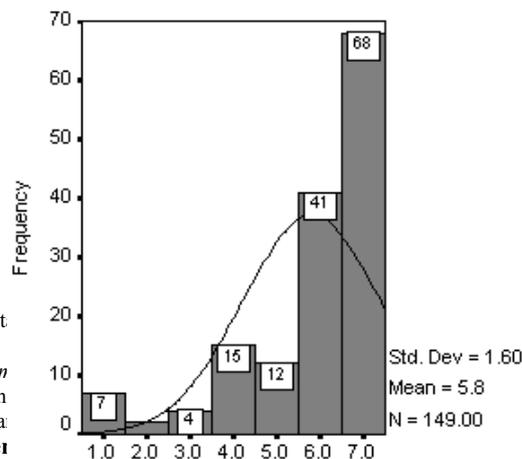
Figure 1: Responses to multiple avatar support.

them for varied purposes ranging from a simple purpose such as "*I like avatar, it gives me something to look at when chatting*" to a more meaningful purpose such as expressing their mood to online friends, "*I use a funny avatar when I am happy*".

Around 80% of the respondents want to display different avatars when they chat with different people (mean = 5.8; std. dev = 1.6; n = 149), as seen in Figure 1. One participant responded "*I often use my real photo [as avatar] when chatting with Mom, Dad and my brother. But I'd use someone else's photos or cartoons when chatting with friends*".

On a practical level IM supports communication, but for many respondents IM is a place for social interactions, and sharing interests. We found that avatars are certainly effective in supporting IM to serve those purposes. As reported by one respondent "*If I have an interesting picture, I used to email to my friends. But now I often set the picture as my avatar so my friends can see it. But some pictures, I don't want all people [in the buddy list] see it*". Our respondents' comments reflected the overwhelming interest in supporting multiple avatars in IM.
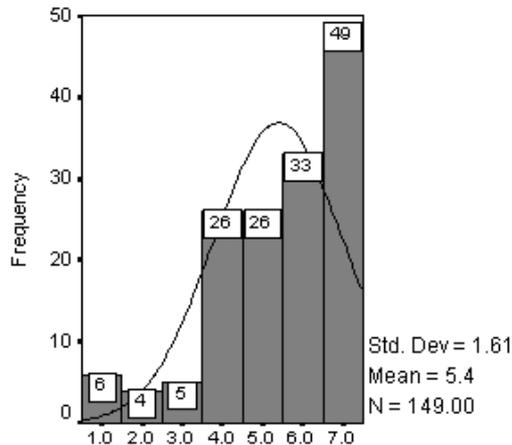

Figure 2: Responses to multiple status support.

Multiple Statuses

While an avatar is a graphical expression of users, online status (referred to as status for short) is a text-based method commonly used by IM users to project themselves to other online friends. "*I often use status to tell my friends if I am sad or happy and also edit my status to tell them what I am doing like studying, cooking, and stuff*" said one participant.

The text-based representation makes status very flexible in supporting the users to describe themselves to their online friends. "*Whenever my computer is switched on, I am in Yahoo. I don't turn off my Yahoo even when I am busy doing assignments. I don't want to use Yahoo default status like 'busy' I often use something like 'working on law assignment' instead.*" Nearly 75% of the respondents want to use different statuses with different people in their buddy lists (mean = 5.4; std. dev = 1.61; n = 149) (Figure 2). It shows a strong need of providing multiple statuses in IM.

It is a common behaviour for IM users to interact with many people simultaneously. 92% of our respondents had used IM to chat with two people or more at the same time: 16.2% chat with a maximum of 2 people; 23.7% chat with a maximum of 3 people; and 52% chat with more than 3 people (mean = 3.20, std. dev = 0.09, n = 173). Often, topics of those concurrent conversations are different and people compose their status to reflect the topic of a conversation. One participant responded that after watching 'Shrek 2', she often uses the '*donkey + dragon = so cute*' status when chatting with friends about the movie. Therefore, supporting multiple statuses allows IM users to customise their conversations with different people at the same time.

Boundary Control

We found that the way in which IM allows the user to be contacted at any time is a concern. Around 75% of the respondents want to control who can see them online (mean = 2.6; std. dev = 1.93; n = 149), as shown in Figure 3. The results indicate that the majority of the respondents disagree with the idea of not being able to control who can see them online.

Figure 4: Participants' choice of IM when chatting with different people.

Currently, MSN Messenger provides a 'block' feature that allows users to stop others from knowing if the users are online. Although this technique allows users to control who can see them online, it was not well received by our participants. One participant commented "*I don't like block [the block feature], the name itself sounds so negative to me*". More interestingly, on the one hand IM users want to control their online visibility that is seen by others, on the other hand they do not like to be blocked by other users, as responded by one participant "*I want to be able to find out who has blocked me on their buddy list, but I want to go online and appear offline*".

Some respondents choose to be invisible all the time because they do not want to be interrupted by other people. This was encapsulated by one respondent who stated, "*I never set status to available. I often start a conversation if I need to*". It indicates that IM users are very careful about policing their boundaries of the social networks created by the IM community.

Interoperability

"*I am using MSN since most of my mates use it*" is how one respondent justified why MSN is his favourite IM. It reflects the fact that IM users choose one IM tool not only because of its functionality, but also because of the choices of other people in their virtual community. Currently, there is a lack of interoperability across IM networks. Each IM network only supports its own registered users, for instance, Yahoo users cannot log into MSN network and vice versa. One respondent said "*I like to use Trillian and Gaim, because I can install them in [computer] labs and I can log in both MSN and Yahoo*".

When the users assume MCI's across different IM networks, it is crucial that they can easily switch between different identities. The majority of the participants (92%) had used IM to chat with two or more people at the same time. And, almost haft of them (46%), who chat with more than one person simultaneously, had used different IM tools when chatting with different people (Figure 4). Hence, there is a strong need for interoperability between different IM networks. That is, once the users join the IM community, they can assume any identity
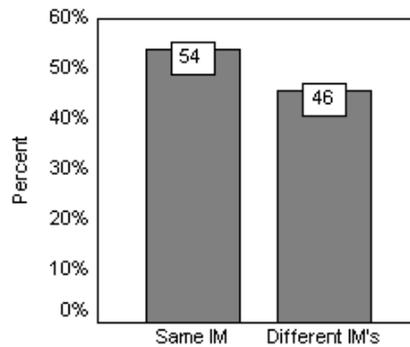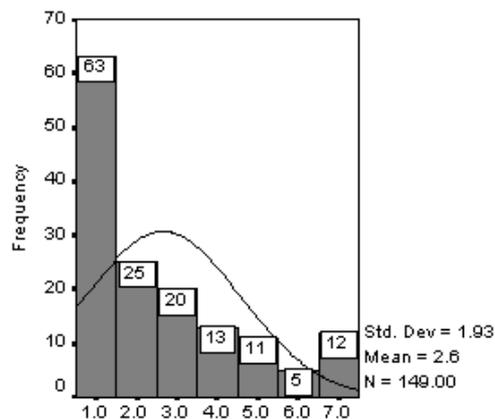

Figure 3: Responses to "I don't want to control who can see me online".

they want without having to know the IM service provider. The users' shift from one identity to another should be seamless and transparent to IM services.

DISCUSSION

In this section, we discuss possible approaches to tackle the five issues reported above. First, regarding interoperability, this can be seen as a technical problem, which can be resolved by appropriate resource-sharing mechanisms between IM network providers. At an application level, developing systems like Trillian (Cerulean Studios) or Gaim (Gaim at SourceForge), which allow users to log into many IM networks simultaneously, can be one possible approach.

Second, boundary control is a techno-socio problem that involves balancing between users' privacy and trust, and enforces high security. Although many studies (e.g., Kahin and Keller 1995, Lazar et al. 2001) have looked at this issue, much further work needs to be done to find viable working policies for controlling a personal virtual boundary in IM. In order to be effective, policies must be strong enough to protect users' privacy but still flexible enough to adapt to the rapid change of the community (e.g., change of users' behaviour, change of users' trust one to another, etc.).

Third, to support a single nickname, multiple avatars and multiple statuses, we propose a framework that can support the one-to-many relationship between a user's *username* and the user's many *identities*. As shown in the class diagram in Figure 5, our framework extends the current framework of IM by adding one-to-many and many-to-many associations between different IM components. For examples,

- associations between 'Username' and 'Avatar', and between 'Username' and 'Status' are one-to-many (1…*) relationships. That means each username can use many avatars and edit many online statuses;
- associations between 'Group' and 'Avatar', and between 'Group' and 'Status' are many-to-many relationships. That means each group in a user's buddy list can use many avatars and each avatar can be used by different groups in the buddy list;
- associations between 'Avatar' and 'Nickname', and between 'Status' and 'Nickname' are one-to-many relationships. That means only one avatar and one status can be set for each nickname (i.e., a person appears in a buddy list) at a time. However, any avatar and status can be shared among many nicknames.

In the remainder of our discussion, we briefly present the interpretations of our framework in designing IM tools. Drawing on the framework, we worked together with the participants of our interviews to design a low-fidelity prototype of an IM tool using a paper-prototyping technique. The purpose of our paper-based prototype is to sketch out ideas and possible user interface (UI) to support MCI's. After being happy with an overall layout in a paper prototype, we quickly transformed the layout into a higher fidelity prototype. Figure 6 shows an example of high-fidelity UI after being converted from a low-fidelity paper-based prototype. In Figure 6, a chat window contains a conversation between two users: local user and remote user. Their details are illustrated in Table 1. The prototype shown in Figure 6 supports multiple avatars and multiple statuses by allowing a local user to set different avatar and different status for each conversation. For example, Minh (i.e., a local user) has options to change another avatar and another status. When a change is made, new avatar and new status are merely applied to a current conversation (i.e., conversation between Minh and DarkAngel) by default. However, if Minh wants, he also can set a new avatar and new status as global; and they are automatically applied to all conversations between Minh and people other than DarkAngel. In a situation when a global avatar and a global status are used, it is similar to what being implemented in current IM tools. However, in more general situations, Minh can display more
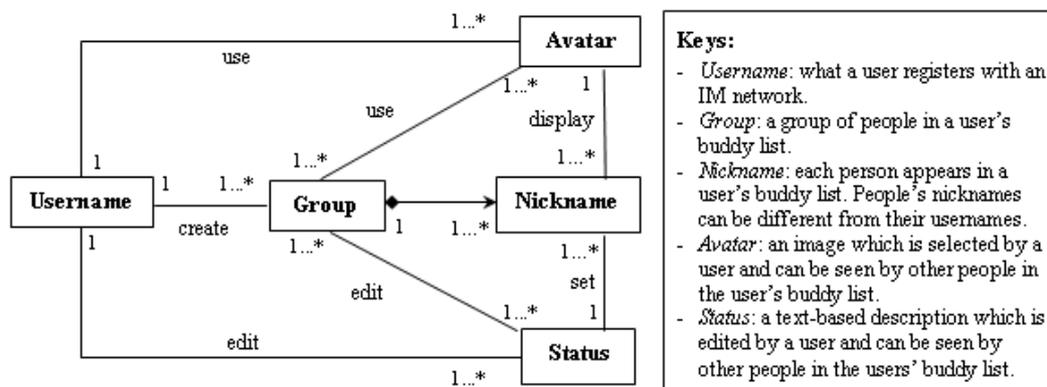
Figure 5: Class diagram shows the framework of MCI support.

than one avatar and edit more than one status.

	Local user	Remote user
Nickname	"Minh"	"DarkAngel"
Location	Left hand side of the window	Right hand side of the window
Status	*"Stop raining pls .. Life is not fair"*	*"Coffee at Darling Harbour .. Coolest"*
Avatar		

Table 1: Details of local user and remote user, who are illustrated in Figure 6.

The mock-up screenshot in Figure 6 is the result of our very early work in designing UI, thus it is not completed in any way. However, it does show essential features that are lacking in current IM tools. And more importantly, it illustrates how our proposed framework can be interpreted in UI design.

CONCLUSION

The paper has reported our study of *multiple concurrent identity* (MCI) support in the Instant Messaging (IM) community. The study has identified five themes of single nickname, multiple concurrent avatars, multiple concurrent statuses, boundary control and interoperability. A strong message growing out of our study is that in many cases IM users want to represent themselves differently when interacting with different people simultaneously. The study shows strong needs for providing MCI's in IM. MCI's can be supported in many ways such as allowing users to use different avatars and different statuses at the same time. Based on the results of this study, we proposed a new framework of MCI support in IM.

As future work, reflecting on these five themes, we will develop personas and scenarios that can be used to translate user needs into the design process. In addition to that, we are also interested in improving support for presence awareness (i.e., information about the availability of IM users) and message awareness (i.e., information about received and sent messages) in IM.

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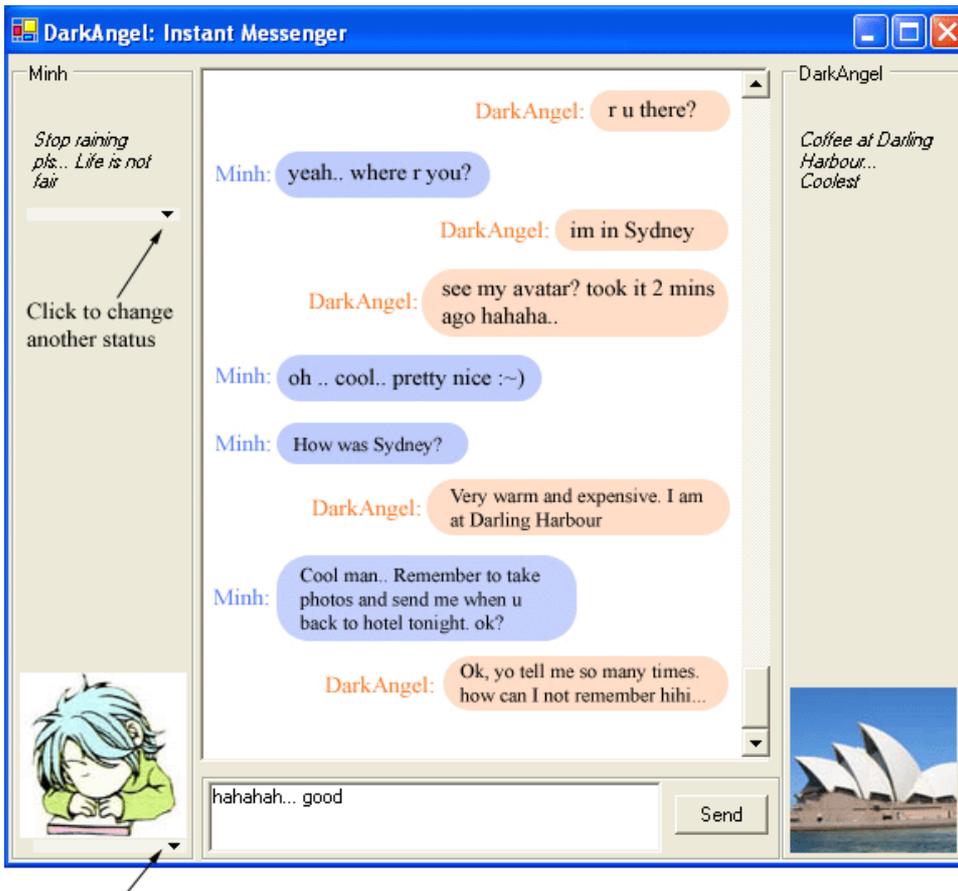
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APPENDIX A

A.1. Demographic multiple choice questions

1. Gender
2. Age
3. Which Instant Messengers have you used and how long have you been using them?
   (*If you started using an Instant Messenger, say 3 years ago and have used it for, say 6 months, your response to this question would be 6 months.*)
   - Yahoo Messenger
   - ICQ
   - AOL's Instant Messenger (AIM)
   - MSN/Windows Messenger
4. What is your most favourite Instant Messenger? And, why is it your most favourite messenger?
   (*If your favourite Instant Messenger is NOT one of the following four Instant Messengers, please select the "Other" option and specify the name of your favourite Instant Messenger.*)
   - Yahoo Messenger
   - ICQ
   - AOL's Instant Messenger (AIM)
   - MSN/Windows Messenger
   - Other (specify name)
   Why is it your most favourite Instant Messenger?
5. How often do you login to Instant Messengers?
6. When do you login Instant Messengers? (your status can be offline or online)
7. Do you ever login Instant Messengers but you set your status as *offline* or *invisible*?
8. When do you often set your status *online* (i.e., available, visible)?
9. For how long per day are you actively using Instant Messengers to chat?
10. How often do you have *webcam* conversations?
11. How often do you have *audio* conversations?
12. What is a *maximum* number of people you ever chat with at the same time? (can be in a group chat or separate private chats)
    If a maximum number of people you ever chat with is **more than 1**, do you ever use different Instant Messengers at the same time to chat with different people? (No/Yes)
13. Do you ever find Instant Messengers limited to express your ideas?
14. Do you ever chat with people located at different countries?

A.2. Seven-point Likert scale questions

Questions	Strongly Disagree	Moderately Disagree	Slightly Disagree	Undecided	Slightly Agree	Moderately Agree	Strongly Agree
I like to have webcam conversations.							
When my webcam is on, I want to know who are currently viewing my webcam.							

For each person in my buddy list, I want to know whether the person is able to have video conversations (i.e., whether the person has a webcam installed).						
Having video on all the time is useful.						
I like to have audio conversations (i.e., voice chat).						
When I speak in an audio conversation, I want to know who can hear me.						
For each person in my buddy list, I want to know whether the person is able to have audio conversations (i.e., whether the person has microphone and speakers installed).						
Having audio on all the time is useful.						
In a group audio conversation, if a person is speaking, I want to know who that person is.						
I feel more comfortable with text-based conversations than audio or webcam conversations.						
I want to set different statuses for different people in my buddy list.						
I don't want to control who can see me online.						
I want to set different avatars for different people in my buddy list.						
Sometimes, I want to show other people, which earlier messages of the same conversation I want to refer to.						
Displaying the time each message was sent is important.						

After I send a message, I want to know if other people actually receive my message.						
I want to link emoticons with correct messages sent earlier by other people.						
I don't want to know geographical locations of other people.						
I want to know other people's local time.						
I want to know how long other people have been idle.						
I want to know how long other people have been online.						
Knowing if a person in my buddy list is busy chatting with someone else is necessary.						
When I am in a group chat, I want to know a total number of messages sent by each person. (For example, how many messages were sent by person A, how many messages were sent by person B, and so on)						
Playing sound when a friend comes online is not necessary.						
When I join a group chat, I want to know who were there before and have already left.						
When I join a group chat, I want to know who are going to join.						
When a conversation is getting long, I want to know which part of the conversation other people are viewing.						
In a group chat, I want to see pictures of other people next to their nicknames.						
Playing sound when a friend goes offline is not necessary.						

Playing sound when a new message arrives is annoying.						
Being able to send offline message is important.						
In a group chat, I want to send private voice messages.						
I want to be able to edit previous messages of the same conversation.						
I want to customise my emoticons.						

A.3. Open-ended questions

1. What are your uses of audio and video chats?
2. What are your uses of avatars, online statuses and sound alerts?
3. What other features do you want when using Instant Messengers?