Using Tags to Assist Near-Synchronous Communication

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ABSTRACT

In this work, we introduce the use of tags to support the near synchronous use of instant messaging (IM). As a proof-of-concept, we developed a plug-in in Lotus Sametime, an enterprise IM client. Our plug-in supports tasks that do not need immediate attention and tasks that have deadlines. A trial deployment and survey shows that users can see the potential usefulness of such a tagging system in their IM communication. Furthermore, users rated our design intuitive and easy to use. Longer study is needed to explore communication norms that results from its use.

Author Keywords

Instant Messaging, IM, Message Tagging

ACM Classification Keywords

H5.3. Information interfaces and presentation: Group and Organization Interfaces—Computer supported cooperative work.

INTRODUCTION

Instant messaging (IM) is a text-based communication medium designed to support real-time communication between two or more people. It is a popular medium, having more than 300 million active users worldwide. Its popularity has been attributed to its flexible nature; supporting tasks that range from quick clarifications to keeping in touch socially with people [4, 7]. Since its inception, it has been adopted in both work and social settings for many purposes.

As the name suggests, IM was designed to allow instant, synchronous communication. Communication requests have features to grab the attention of the receiver (*e.g.* flashing, popping up, making noise), and the expectation is that receivers will typically respond to the message either right away or not at all - similar to the way phone calls work. However, in actuality, IM usage resides in both the synchronous and asynchronous realms (near-synchronous). Senders do not always need an immediate response and receivers often choose to delay their responses to incoming communication requests. Its current design lacks support for many tasks that it is actually used for.

This leads to subtle, but detrimental problems in IM usage. Senders have no way of indicating if the communication requires immediate attention or not, and as a result, urgent IM communications do not stand out, and receivers are interrupted the same way, regardless of the origin or goal of the message. Furthermore, receivers who choose to defer a communication request do not have any structured reminder support. Receivers may intend to return to a communication request at a later time, but forget to do so.

To address this problem we propose the incorporation of communication tagging. Senders can use tags on IM messages to trigger the right type of task support on the receiver's side. To test this idea, we developed a plug-in for Lotus Sametime 7.5 [5]. For this initial prototype, we focused on two types of tasks that can benefit from near-synchronous communication support: tasks with a deadline and tasks that do not require immediate attention.

Our plug-in was deployed for several weeks to 27 corporate researchers and interns. At the end of the trial period a survey was conducted to evaluate the design and to explore the use and value of the tagging support. This exploratory deployment indicated that most of our users could see the utility of tagging support and would like to have it incorporated into their everyday IM clients.

The main contribution of this work is an introduction of the use of tagged messages to facilitate communication in IM clients. We have provided an initial design and proof-of-concept for designers planning to incorporate similar concepts into everyday IM communication or researchers interested in studying interruptions and the continuous nature of synchronous communication. Our exploratory study also suggests some possible extensions for similar systems.

RELATED WORK

A similar problem of usage outgrowing the original design of communication media was noted by Ducheneaut and Belotti in their work on email: "email is overloaded, providing inadequate support for certain tasks it is routinely used to accomplish" [3]. Their work highlighted the need to redesign communication technologies to support the actual communication practices that people have developed. Both

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researchers and commercial firms have developed technical solutions offering users more transaction support for email [*e.g.* 1, 6].

The idea of using tags for communication messages has been around for many years. Research systems such as the Coordinator, introduced by Winograd and Flores, used Speech Acts to allow people to indicate the intent and actions associated with the communication [9]. However this system was very inflexible, failing to attract much use.

Besides research systems, limited tagging is available and common practice in everyday email use. Text tags typed into the subject line such as [Action Required] or [Call for Participation] are tags that most readers have seen. In addition, the urgency flag in email clients can be considered a communication tag. A commercial solution for email from Seriosity [8] supports currency-like system with email to indicate the relative value and importance of a message.

However, providing ways to tag communication is only half of our implemented solution. We couple the tags with automated support on the receiver's end. A recent research application, QnA [2], provides an example: QnA increases the salience of incoming messages that may deserve more attention. While their work focused on just questions and answers, our work explores the use of a general mechanism to support a range of IM communication tasks.

SUPPORTED TASKS

For the scope of this work we focused on a subset of the tasks for which IM is routinely used.

Tasks that do not Require Immediate Attention

Not all communication requests need the immediate and full attention of the receiver. However, current systems treat all IM messages equally. Because senders may misuse a system that allows them to trigger more salient, attention demanding notifications, it is arguable whether providing this service is a good idea. However, senders should be given the opportunity to send less distracting, less demanding notifications if they believe it to be appropriate, since such design is less open to misuse.

Current IM clients allow the receiver some coarse-grained control over the type of notification level for incoming messages (i.e. popup window versus system tray notification). However, there is no control to set or modify notifications on a per message basis, or by the sender. Our system takes a first step in this direction by giving senders the option of sending messages in a non-distracting manner. This can be useful for messages where the sender just wants to show the receiver something, i.e. a video or an article, or wants to discuss something as soon as the receiver has a free moment. The non-disruptive option is particularly useful in a corporate environment for sending IM messages to people much further up the management chain.

Tasks that have Deadlines

Deadline tasks differ significantly from other types of tasks in that the value of communication is high and might even gradually increase up to the time of the deadline, but drops after the deadline. This suggests the need to create support for a reminder system.

Allowing senders to signal how soon they need a response has two benefits. First, receivers, given more information about the sender's value of the communication, can better prioritize their tasks in relation to this communication request. Second, the signaled time can be used to provide automated reminders for receivers. If they choose to delay responding to an incoming IM message, an automated reminder can bring the pending communication back to the receivers' awareness, allowing them to reprioritize their tasks, if they so desire.

DESIGN AND IMPLEMENTATION

In many ways, our design for communication tagging was influenced by the plug-in environment that we implemented it in. We attempt next to tease apart the high level design guidelines we followed, and then discuss how they manifested themselves in the implementation.

Design Guidelines for Communication Tagging Support

In the spirit of keeping IM flexible, we were careful when designing to not restrict in any way the feature set for IM use. The communication tags are obviously optional and require minimum overhead to use. Tagging is lightweight and fast - requiring as little as a single click. We do not attempt to make any deductions about the nature of each message and rely on users to determine which tag, if any, is appropriate with which message.

Second, we wanted to create tags that are intuitive and understandable to both the taggers (i.e. senders) and their intended recipients. This is to prevent unintentional misuse and to improve users' understanding of the system. We also wanted to keep the length of the tag at a minimum so they do not get in the way of the light-weight feel of IM. For this initial implementation, we decided to keep the tags text-based so they could potentially be used to interact with other IM clients and services. We specified the "no popup" tag to be [Xpop] and used the format [ND] for the time tags, where N is a positive numerical value and D can be s, m, h, or d for seconds, minutes, hours and days respectively (e.g. [30m] or [1h]). We used square brackets because they are common in tags and also because they allow for a quick differentiation between the tag and the content.

Lastly, the use of tags should incur minimal end-user cost, both in setting and receiving the tagged message. As the sender, there should be different ways to accomplish the tagging in case one style is more appropriate than another. Additionally, receivers should not be distracted by the automated service that is triggered by the tags. We realized there was potential for misuse in allowing senders to trigger reminders, but we were interested in seeing if a cultural norm (especially corporate norm) would develop.

Implementation

These design guidelines coupled with the Lotus Sametime 7.5 plug-in environment led to our current implementation of communication tagging support.

We created a mini-app for the persistent chat reminder list and added controls to the message tool bar to provide the tagging controls (Figure 1 and Figure 2).

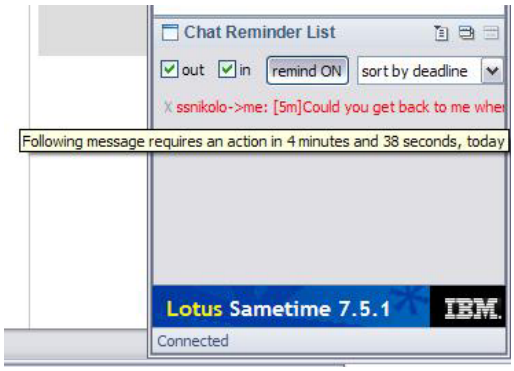

Figure 1: Mini-app at the bottom of the Sametime client. The mini-app is used for a persistent chat reminder list.

Figure 2: Tagging controls added to the message tool bar

This mini-app provides support for the following features: 1) users can mouse-over an entry to see how much time is left for a message with a time tag; (see Figure 1). 2) click on the "x" to remove a particular entry, or 3) double click on an entry to bring up the chat window with that communication partner; 4) sort tagged messages based on arrival, or time till deadline; and 5) turn the reminder function on or off. This pending chat list shows tagged messages for both incoming and outgoing messages.

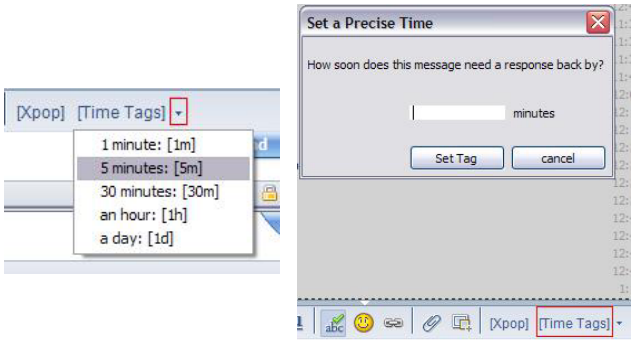

Figure 3: Two different ways to enter in the time tags. (left) dropdown list of pre-set time intervals. (right) dialogue popup to enter in an exact time.

For both tags, users can type the tags either directly into the message itself, or click on one of the buttons we added to the message tool bar (see Figure 2). The buttons facilitate recognition and reduce required recall. For the time tags, selection or input is required to specify the time. The user can either choose from a dropdown list of five pre-set time intervals, or they can specify the exact amount of time in minutes by which they want a response (see Figure 3).

Reminders are implemented to match the reminders in Lotus Notes, an email application that Sametime users are familiar with. It provides the options of opening the message dialogue window, closing it (to ignore) or snoozing (the user can set an interval in minutes when they would like to be reminded again).

We ran a test deployment with a handful of interns. This led us to add a reminder on/off button (for the receiver) because the interns would mischievously send each other [0.5m] tags with no content, interrupting each other with multiple reminder notifications. While a permission control system would have been a more detailed response to this, in the short-term we decided the reminder support should at least have a coarse-grained on/off control. Furthermore, the plug-in was modified so that if the user's IM status is busy (i.e. do not disturb), the reminders are not triggered.

FIELD DEPLOYMENT AND DISCUSSION

To gather feedback and to obtain some understanding of how this type of IM communication support is, or could be used, we deployed the plug-in to interns and full time researchers for periods ranging from one to four weeks. In all, 27 people used the plug-in. Sixteen of those still have the plug-in running at the time of writing this paper. Some of the interns used the plug-in for only a week or two since it was deployed near the end of their internship.

Participants were solicited via email and were told they would be entered into a drawing for a few prizes in appreciation for their participation. When communication partners interact with the users of our plug-in for the first time, the system sends them an automated message letting them know the tags available and the URL and instructions to download and install the plug-in.

We conducted an exploratory survey at the end of week four, probing users for their thoughts on ease of use, value of communication tags, usage and scenarios in which tags were or could be useful. Of the 27 users solicited for the survey, 13 started it, but only 10 completed the survey. Four were full-time researchers and five were interns, and one selected other as the employee type.

Both of our tags scored high in terms of ease of use on a 5-point Likert scale rating their agreement with statements such as "*it was easy to use the time tags*" (time tags: Mdn=4, no pop: Mdn=4). Our users also understood what the tags meant (time tags: Mdn=4, no pop: Mdn=4).

Time tags had higher usage than the no popup tags: 6 out of 10 sent messages with the time tags and 5 received messages with the time tags. On the other hand, only 3 sent

messages with the no popup tags and only 2 received messages with no popup tags. Yet when asked about the value the tags provided in our users' daily IM communications, the no popup tags scored higher than the time tags (time tags: Mdn=3, no pop: Mdn=3.5).

Our exploratory deployment suggests that while the usage was not very high, there is foreseeable value in incorporating the communication tags system in our everyday IM. Most users could see *scenarios under which the tags may be useful* (time tags: Mdn=4, no pop: Mdn=4) and in general, they would *like to see the tags being incorporated into everyday IM clients* (time tags: Mdn=4, no pop: Mdn=4).

Previous work in groupware has suggested the need for critical mass when using a new technology feature like ours. Therefore, we had not expected a high level of usage especially since our plug-in is flexible by design and would need an extended period of use to establish usage norms. Thus, when asked what was the primary reason for the lack of use, our users mentioned that the "trial period was not long enough" and that they are "not used to the new concept." One user even expressed concerns for the time tags being perceived as a rude gesture. "Putting a tag on it I felt was like putting time pressure on them telling them they must respond to me by a certain time and then even pop up reminders that they must respond to me."

Our main goal for this exploratory study was to understand how the tags were and could be used. This allows us to see if the current versions of the tags were sufficient by themselves and what other potential tags may be useful.

Coordination was the primary usage for time tags. Our users mentioned examples of using the time tags to coordinate lunch or going to a reading group. Users have also discussed the potential of using it to remind each other about planned events such as meetings and calls. These potential scenarios of use include both urgent and non-urgent communication. One mentioned "I can imagine a situation such as a call starting where a time tag would be useful when looking for somebody who needs to be on the call but is not on" whereas another said "when I know the other person is very busy and the issue is not that urgent, then this tag might be useful."

In terms of no popup tags, our users suggest it would be useful when using it to communicate with someone who is busy, in a meeting, or a "director level person."

The way the interns had initially exploited the time tags to send contentless interruptions to each other suggested the desire for more socially oriented tags or what we can call "fun tags." This may come in the form of pokes, or other designs, which would allow for social bonding even if they do not support a particular work task. Another possibility is to allow more customization of communication tags. More user control would allow them to gear the communication tags to their daily routines. However, customization might prevent users from firmly establishing an understanding of resulting actions from each tag and may actually decrease their perceived value.

CONCLUSION AND FUTURE WORK

We introduced the idea of embedding communication tagging in IM to facilitate the different types of tasks and activities that occur through it. The deployment of our initial prototype providing support for deadline-based tasks and non-urgent tasks suggest that IM users could benefit from the set of tags we have provided.

However, in order for us to fully understand its potential impact on our everyday IM use, a larger and longer field study must be conducted. This will allow us to explore the norms that are being established and how the communication tags actually impact everyday practices. We believe that tags may one day be integrated to everyday communication just as emoticons have.

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