Investigating the use of mobile instant messaging and its impacts

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ABSTRACT
Mobile instant messaging is sweeping the whole world especially among youngsters. Its near-synchronous nature enables people to chat in more comfortable and natural ways. This work analyses how MIM is used in our daily lives and its huge influences. Results show that MIM is adopted usually because of cost and social impacts, and it is mainly used to communicate friends within a small circle. The main problems brought by MIM are privacy and its interruptions on people’s lives. As a widely used medium, its effects on users can be summarised as checking behaviour, interruption impacts and positive facilitation on friendships.

Keywords
Instant Messaging, Near-synchronous, Smartphones

1. INTRODUCTION

1.1 Mobile Instant Messaging
Instant Messaging (IM) has been used in people’s daily life for many years. With the proliferation of smartphones, Mobile Instant Messaging (MIM) is becoming increasingly popular nowadays. MIM is a special form of IM with the ability to engage in IM services into a mobile phone. It is a free message service that enables users to facilitate social interactions[19]. Since smartphones are becoming increasingly popular all over the world, MIM applications are installed by most of smartphone users. Applications like WhatsApp, Viber, Facebook Messenger, WeChat and Line are widely used among the public and in the way of attracting an increasing number of users to use them. With these applications, users of mobile phones can send messages to other people nearly without delays at no cost, and most of the existing MIM applications allow group chat, which provides a more efficient way for a group of people to talk about specific topics or just exchange information[5]. Many messenger applications offer features such, the exchange of graphics, video and even audio messages as well as stickers or emoticons. All of these features make MIM a powerful and effective tool to communicate with friends and families.

By the end of 2013, WhatsApp had gained 590 million registered users, 350 million of those are monthly active users, with more than 10 billion messages sent every day[29]. According to Deloitte’s technology prediction report, 160 bil-
lion instant messages were sent in the UK 2013, up from 57 million in 2012, overtook texting in the UK. The biggest Chinese MIM application, WeChat, first released in January 2011, as of August 2014, WeChat has 438 million active users, with 70 million outside of China. The company Tencent of WeChat use it as a platform to build an ecosystem to support moments sharing, WeChat payment, QR code scanning, look around and so forth. Based on the great potential for the capital market, this application helps this company’s stock capitalization to continually increase over 100 billion pounds at present. In February 2014, the social networking giant Facebook bought one of the most popular MIM app, WhatsApp, in a deal worth a total of 11.4 billion pounds.

1.2 Other mediums of communication

Even if MIM is one of most popular applications on people’s mobile phone, other traditional communication tools still exist in our daily lives. A study showed users would like to accept a wide range of tools for communication[22]. However, every medium is unlikely to constantly gain its popularity, instead, people are easy to be affected by others around them and follow the latest trends, which also means even for the most popular tool, it can reach its peak at a specific point and then its daily use will become steadier or decrease[23]. Just like SMS (Short Message Services) used to be a very common way for people to contact each other, but with the impact of usage of MIM, the use of SMS is gradually diminishing. Email also experiences a similar trend. However, those traditional tools do no disappear and are still used by some people or in specific conditions. It seems like each tool serves different communication purposes, that is why people adopt multiple forms of tools instead of substituting one medium for another. The main mediums of communication are FtF (Face-to-Face contact), phone call, IM, SMS, and SNS (Social Network Website). Even most people feel like the function of SMS could be fulfilled by MIM, people are still using SMS as a medium to contact instead of discarding it totally.

SMS has been affected mostly by the advent of MIM. Text messages can be sent through SMS at some cost. As the function of SMS could be replaced by MIM to some extent, many people switch their use to MIM instead of SMS.

Phone calls provide a good opportunity to sustain relationships through immediate exchanges, particularly when partners are geographically separated. The advent of the Internet brought many new ways for people to interact with others. Email, for example, is one of tools, which is very popular in workplaces. Email is a method of exchanging digital messages from author to one or more recipients. Email is considered as an asynchronous medium for most people, which means people do not expect the instant responses, thus this nature of email gives users flexibility to deal with a vast number of issues they may encounter in everyday work. Due to the nature, people could use email to arrange their routines more effectively and value this ability of delayed communication[6]. It seems like email is usually used as a more formal way to contact others, thus it is widely used in working conditions. Another example may demonstrate this fact is that a student uses IM to communicate with friends but uses email to contact teachers. In workplaces, users prefer to use email as their first option. When users feel a necessity to receive an immediate response from others or need to chat in multiple rounds, they would switch to use IM as a result of its easy use and expectation of quick response. But email is not as easily replaced by IM, since it is used for sending longer, detailed messages, file attachments, and messages with many recipients [19].

SNS is especially popular among young people, Facebook is the most popular one which is widely used all over the world. Users can create a user profile, add other users as “friends”, post status and share photos as well as videos, exchange messages. People can build his or her own friend circle on Facebook and know other people's activities. People can comment or like their post to show caring and maintain relation-
ships. Therefore, Facebook is used to kill time and as a pastime, it also help users be aware of what their friend are doing[23]. IM is regarded as a more frequently used medium as people need to contact with others on a daily basis. Facebook also realised the challenge of user switching their time to IM, as a result of this, it launched its own IM tool Facebook Messenger and enforced users to install a new application on their smartphones instead of integrating the Messenger within the existing Facebook app. Additionally, one of the most popular IM app, WhatsApp was also purchased by Facebook due to the concerns of IM potential threat and market growth.

1.3 Structure of this essay

The rest of this essay is structured as follows: Section 2 describes the MIM in more detail, from its adoption, nature to how it is used by people and the problems it brings into people’s daily lives. Section 3 is about the ramifications of MIM, as checking behavior, interruption impacts and effects on the friendships are discussing specifically. Section 4 depicts what needs to be done for future work. Section 5 is the conclusion for this essay.

2. ANALYSIS OF MIM

2.1 Nature of MIM

IM is a near-synchronous communication tools, messages can arrived at recipient’s phone quickly. Once the conversation has been set up, people could chat with each other in real-time. This near-synchronous nature of IM creates a multifaceted interaction, by which the presence and interactivity can be enhanced, thus users feel like they are talking with someone in person[24]. IM was seen as more conversational in nature, more fluid and more natural to SMS. In contrast users have to consider how to organize their words effectively to fit all information they want to express in a single message in order to save money when they send messages by SMS, which is unnatural to real conversation[5]. However, with MIM, users do not need to consider how to put all information within a message effectively. They could just use a single word or a single emoticon to express themselves and then just wait for responses, which is more natural.

In addition, there is a natural lack of the paralinguistic due to spatial separation. In FtF chat, people can gain a number of cues from speaker’s facial expression, gestures, or the modification of a verbal representation of a word. Thus, people can easily detect speakers’ emotional change and show the corresponding response due to their emotion. In speech, such attributes contribute to the meaning of a given message and help the listener understand the intended meaning[6]. However, in an IM conversation, those paralinguistic features are hardly detected, thus increase a chance of misunderstanding in certain cases.

MIM is a form of IM, which is predominantly used on the smartphones. One nature that separates it from traditional IM is its ubiquitous nature. People do not need to worry whether the receiver is in front of the computer or not, which allows users to send messages at any time and senders can presume receiver will receive the messages within a short time. In the design the WeChat, this application does not show the online presence of the contacts on purpose, which implies that all contacts is online so there is no need to show this information. This seems to tell uses: “All contacts are available because they carry their mobile phones all the time”. In contrast, WhatsApp shows the online presence in the conversation in order to help user expect when they can get a response[21]. Personally, there is no need to show this due to MIM’ pervasive nature.

2.2 Adoption

Cost is indeed a major factor that influences people’s behaviour when using MIM, another factor for adoption of MIM is social influence[5]. As most of the MIM services are free as long as you have the Internet connection, people can save money through using MIM to send messages. Additionally, even though some people have free SMS services, but when they want
to send a message to another person, the cost incurred by the recipient is an important consideration. For many of users, social influence appears to play a key role in terms of their adoption of MIM[5]. As there are many choices of MIM applications nowadays, the interesting thing is in UK, people are using several apps at the same time. However, people seem to have a rough image about who are using WhatsApp, who are using Viber, or who do not use MIM.

2.3 Usage of MIM

IM is used to maintain a small network of fellow IM users rather than to connect to new others. Hyo Kim, Gwang Jae Kim and others pointed out teenagers communicated regularly with fewer than five IM buddies. Interactions with lovers and best friends were most frequently reported. Friends and acquaintances were also quite common, only family relationships were reported less frequently[10]. Family members are usually parents, who are not skillful at using new technologies. Thus, this may explain why people interact with family less frequently.

IM is regarded as a quick informal communication tool. Emoticons and multiple punctuations are widely used in MIM, which helps to convey a sense of emotion to remedy to paralinguistic nature of IM. This informality lends IM a kind of intimacy that is often absent from other communication mediums. Emotions and attitudes in pure text without emoticons can hardly be perceived[12]. On the contrary, the use of visual cues together with text has been shown to create a more positive attitude than text alone[14]. Therefore, we can see a proliferation of emoticons in IM use. This helps people to understand each other’s emotion correctly without seeing facial expressions. It makes conversation to be more natural and comfortable. People seem to feel less annoyed and more comfortable when someone sends a smile face in an opening line rather than just text. However, the paralinguistic nature of IM does not imply that emoticons must be compensatory, the nature of the emoticon allows it to function as a single utterance[6]. So we can often see people just use emoticons or stickers to convey their meaning, sometimes this is more effective than pure texts to be understood by the recipients.

Previous research showed there is a notion of reciprocity between participants in an email conversation, especially under the circumstances where people need to use email to exchange information back and forth with only 1-2 line of messages in short slot. The time of responsiveness of both partners is highly likely influenced by each other. For example, if one person replies much more slowly than the other, the other person is likely to treat in the same way, making the conversation more slowly[27]. IM interaction is very frequent and I presume this phenomenon also exists in the IM use. If a person always reply you very quick, thus you feel more pressure to reply within a short time. However, when a person often reply slowly, you are likely to be affected by his or her delayed behaviour and thus going to treat the other in the same way. If you reply someone quickly, thus you often expect the same rate of replying. Once this expectation does not match up, you tend to change your responsiveness level. Thus in the IM use, we may gradually gain a rough responsiveness image about every contact about how fast they would reply and during which slot they might be busy. The delivery of the messages helps to expect when could get a response. As people often expect a quick response, when this expectation has not been realised, people might start to think why he or she still has not replied me, especially for sending a message to a new IM relationship as you have no idea about they patterns. Thus, the delivery cue helps in easing this anxiety as we can deduct some reasons for explaining why people have not replied you. For receiver, this cue can also be used to cheat on the receivers, sometimes a person might have already received the message, but because of some reasons, he or she chooses not to reply immediately as they just pretend they do notice there is a message. However, this also brings a privacy issue for the users and will be discussed
in more detail in the privacy discussion. Even if last-seen time feature in some applications can be regarded helpful to expect the response, there is a study reporting it is just random guess based on this information to project the responsiveness[21]. They proposed a novel machine-learning approach for predicting and informing whether a person will see a message notification within the next few minutes or not. They refer to this as the level of attentiveness of user.

Multitasking is another feature of IM usage. In the workplace, IM is valued as it enables user to multitask. Nearly all users have the experience to multitask while they are using IM[9]. However, in terms of MIM, because of its more social and personal nature, people seldom use it to discuss work issues with their colleagues. Even if people seldom use MIM to discuss work, there are still many scenarios where people multitask with MIM, such as they are watching TV, reading a magazine and so forth. In those situations, people are interested in what they are doing but do not want to ignore their messages, they might choose multitask. Even though users use IM to receive social support from friends as frequently as in person and by phone, and to freely talk to others of the other gender, they find their IM conversations much less enjoyable than their visits or phone conversations[4]. Multitasking might explain this phenomenon. As multitasking can a distraction for their conversations, people will not pay all their attention to the conversation.

2.4 Issues and problems in MIM

2.4.1 Privacy

The general feeling of users is that MIM is quicker and more immediate when compared to SMS[5]. Some applications provide status information and last-seen time to help people predict the time they need to wait for a response. However, these functions also violated users’ privacy to some extent. As MIM often goes along with an expectation of high attentiveness, that the receiver will notice and read the message within a few minutes[21]. Thus, if the receiver does not reply quickly when they are online, it may make the sender feel like he or she has been ignored.

Another privacy issue is the delivery of messages. As some applications provide users with function to see whether the receiver has read the message or not, on one hand, it could make the sender aware of the state of messages, on the other hand, receiver feel more pressure to reply a message once they open the application.

2.4.2 Interruption for receivers

One of the main challenges with IM communication is that when starting a conversation, time and topic are convenient for the initiator, but not necessarily for the recipient[15][25]. In the workplace, IM have been found to interrupt workers from current tasks and make it difficult to resume it after the interruptions[1]. As MIM is pervasive, senders often presume that receivers can receive the messages within a short time. This increases the probability of being interrupted for receivers. Sometimes, receivers are not convenient and busy with their work or study. However, when they receive a message, they may feel a pressure to reply it quickly as a result of the expectation from sender. Some applications like WhatsApp provide an availability state for users to manually set their availability. But the reality is that many users do not update this status reliably[3][26].

When people do reply the messages under a working condition, they have to do multitasking. Under some working conditions where users have to interact with their colleagues, they may prefer IM because it enables them to multitask[27]. However, MIM is not likely to be used in workplace, as it is likely for social and personal relationships. Therefore, in most cases where people feel interrupted but have to multitask, it is highly likely their outcomes could be affected by multitasking. In a MIM conversation, even though people are not willing to continue to chat because of their work, they are not likely to refuse chatting directly because of politeness and showing respect.

3. INFLUENCES OF MIM
3.1 Checking behaviour

Because of the portable computing devices, it is evident that users’ practices are changing. They socialize in new ways, a vast number of social application are available, they share and gather information in anytime anywhere[20]. As a frequently used application in smartphones, it is obvious MIM has huge influence on people’s behaviour. One of those changes is checking behaviour[20]. Due to the immediacy of IM and the pressure from senders, people tend to check their mobile phone every other time to make sure they have not missed any messages, especially those from whom they might consider important. This is referred to as the interactional checking habits in prior studies. It is also suggested that checking habits can act as a “gateway”to other applications, which means people start interaction with mobile phones with checking, but when they find nothing receive, they may turn to use another application to kill time[20].

3.2 Interruption impacts

As mentioned in previous sections, interruptions are common during the use of MIM, as a result of senders often assuming receivers are available all the time. Interruptions could have a negative impact on people’s ongoing task as our attention is limited[8]. When an interruption arrives, a knowledge worker may adopt one of four approaches: attend to interruption immediately, use a negotiated approach, use a mediator or schedule the interruption for later processing[13]. No matter what approach the user choose to deal with the interruption, it would be a distraction for users who are on their primary task. Thus, interruptions from MIM could negatively influence the task performance and increase overall perceived workload. Previous studies also showed that subjective task complexity decreases objective task performance[8]. When users must pay more attention to the messages, they will need a time to recover their memory on the existing tasks. Thus, if they constantly experience the process of recovering memory, it is likely they might get impatient and their perception towards work complexity may increase as well.

3.3 Effects on friendships

As MIM has been widely used among the public, it is likely that it has a profound influence on people in terms of their relationships with friends. Mobile Phones are carried with people nearly all the time, which makes it more convenient to use MIM to interact with friends or families. Geographical distance is no longer a problem for people to communicate with nearly no cost, as people could interact with their friends and families all the time at all places as long as there is Internet connection or WIFI. Virtually all adolescents use IM to communicate with their existing friends. Even if some studies reported there was no significant effect on the quality of existing friendships or relationships for IM use[2][7], some even reported negative consequences[17][18]. The main reason for those negative effects is that time is inelastic and there is a limited amount of leisure time in any given day[16]. Personally, time should be not considered as a factor to influence people’s friendships. As even the time is not spent in chatting IM, it is likely that people can do a lot of things like watching TV, playing games rather than talking to friends. In contrast, IM is often used as a transient medium, for example, setting up FtF meeting. Some uses of IM are to extend communication with friends they first met who live nearby[4]. In these cases, IM helps a lot as a medium to maintain the relationships, as if there is no IM, people tend to not contact each other any more. With the use of IM, friendships can be maintain for a long time. The majority of studies have shown that IM use can increase the quality of existing friendships[28][4][11].

Because of the informal nature of IM, it helps people to be more relaxed and natural during the conversation. Adolescents find IM more comfortable and suitable for raising personal issues that they find difficult to discuss FtF. Some topics can be embarrassing to be talked
FtF, IM provides people with another place for sharing their worries and other bad expressions. This intimate self-disclosure is highly likely to happen as time passing in IM conversations. A reciprocal relationship also had been found. Adolescents who disclose more online develop higher quality friendships, and these same adolescents are in turn more inclined to disclose to these friends. This self-disclosure during IM conversations proved to be a valid explanation for the positive effect of IM use on the quality of existing friendships[28].

Both SNS and IM are seen as important tools for feeling involved with friends' lives and keeping up-to-date with their activities. Through information provided by SNS, we could know what our friends are doing and what social events are going to happen. A vast number of information can obtain by reading new feeds. IM do not support larger volumes of exchange with lots of people. However, in an IM conversation, the chat can be regarded as a normal FtF conversation, users can talk a lot in IM. The length of time is the key factor that determines their level of intimacy.

4. FUTURE WORK

MIM is widely used around the world as a communication medium and is still gaining its users. In a foreseeable future, MIM is likely to continually be the most popular communication tool. The future work should give more attention to how to design the privacy protection. The existing privacy mechanisms are still intrusive for some people. Additionally, interruption impacts of MIM are common and affect people’s working efficiency, more work should be done to explore a more comfortable ways for everyone to use MIM to communicate.

Impacts on friendships of MIM are still in controversy, even if the majority of studies showed a positive effect on friendships. The future work should investigate how different people with distinct personalities develop their friendships in MIM usage, and find out the key factors that influence the development of friendships rather than simply research the exact effect on the whole population. It is likely people can gain a different use habit and friendships sense towards MIM use according to their different personalities or their factors.

Most of the existing studies of IM or MIM focus on their use of among youth, more studies should also investigate how the MIM is used by all ages of people and different usage patterns as a result of ages.

5. CONCLUSIONS

The goal of this study is to provide an overall understanding of how MIM is used by users and to explore its multiple impacts on our daily lives. We first investigate people’s perception towards different kind of communication mediums: email, SNS, SMS, phone calls and IM. Findings suggest that each medium serves different purpose, people are likely to use several tools to communicate others instead of just using one tool[10]. We point out how each medium satisfying different needs for users.

In exploring MIM in our lives, we find people first adopt MIM for two main reasons: cost and social impact, and social impact are the main reason for users choosing MIM[5]. The most important nature of MIM is near-synchronous communication, allowing users to chat in a natural way. Additionally, paralinguistic and ubiquitous features are also two nature of MIM communication. IM is used in a small circle, mainly with friends. Emoticons and stickers to widely used to remedy its paralinguistic feature, reciprocity and multitasking is common among MIM usage. The main problems that MIM brought are violating privacy to some extend and can be an interruption when people focus on a task.

The influences of MIM on people’s lives can be mainly illustrated as: Performing a checking behaviour, interruption impacts and facilitating friendships. Checking behaviours is people often check their mobile phones in case they miss some messages. Interruption could distract our attention when we concentrate on the primary task, thus impact our working efficiency. Friendships facilitating has been found in the majority of studies even if there are some discrepancies
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