Temporal Pattern of Communication: Messaging Within a Mobile Social Networking App

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ABSTRACT

With the emergence of mobile Internet and social media, human relationship has evolved into a new form due to the much broader reach and more efficient communications enabled by information technology. This paper examines the communication pattern and impact on social group in the context of a Chinese popular mobile social media app. It analyzes a dataset that comprised of the information about sending and receiving messages by 10,000 users over one month period. It found a strong temporal pattern of a significant difference between Monday and other days: the least frequent usages on Monday among the week. The average number of friends a user has messaging contacts with is about 2, far less than the number of friends a user has in total, which can reflect the attributes of users maintaining their social network and friendship.

Keywords: Mobile Messaging App, Personal Network Size, Social Media, Temporal Pattern, User Behavior

1. INTRODUCTION

In just a few years, social media has captured the imagination and participation of so many people, enterprises and organizations. Hundreds of millions of people have adopted new behaviors: transferring social interactions online, forming connections, and creating and sharing content. As of 2013, more than 1.6 billion users around globe have an account on a social networking site like Facebook, Instagram, Twitter and WhatsApp (Chui, 2013).

Recent years have witnessed the success of a number of mobile social media apps, such as WhatsApp, WeChat, Line, Kik, and Kakao Talk. Those have attracted a significant number of participants to be connected with friends, owing to the development of mobile Internet and smart terminals. Companies and celebrities also open an official account to interact with fans and build a following. Facebook saw the great chance and spent $16 billion to acquire WhatsApp, which was Facebook’s biggest acquisition by far (Sadauskas, 2014).

The core of a Mobile messaging app is a collection of chat functions (Figure 1), where registered members can exchange various types of messages with any of your contacts bypass their carrier’s SMS (short messages service). Usually, an app provides multimedia

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communication with text messages; free video chat, hold-to-talk voice messaging, photo/video sharing, location sharing, and contact information exchange.

The mobile messaging app is a SMS alternative, without having to pay mobile carriers for traditional messaging or call fees. It is proliferating even faster than those of the browser-based social networking sites. Compared to online social networks, messaging is highly important on mobile social media apps. Take WeChat for example, users interact with each other in a variety of ways including sending texts, audios, photos, emotions, videos, and playing game together. Such way of interactions also fundamentally changed how people communicated with one another in the physical world.

Users are basic elements of social networking and communities (Guo et al., 2009). Previous research into social networking such as Facebook and Twitter has been performed to provide a deep understanding of what individual are doing and their motives to do so (Ellison et al., 2007, Java et al., 2007). Golder et al. (2007) studied communication pattern exhibited by the collective action of immense number of college users of Facebook. They find a weekday pattern and a weekend pattern exist.

Different from Faceooking like browsing, posting, sharing, finding out friends, messaging requires investment of time and energy, and time indeed constraints affect the use of Instant Messaging (IM) (Grinter & Palen, 2002). Thus, on mobile messaging app the most important word is time. Then we can take into account the effect of a property “being on weekend or weekday”, and take days of week as qualitative characteristic of a user.

The mobile messaging apps are also re-shaping the personal relationship and the way people develop the social network. In the last few years, there was a universal belief that personal social network size should be no more than 150, because of the constraints of the human brain (Hill & Dunbar, 2003). However, the influence factors such as distance and contact availability have faded away with the massive application of mobile phones and social media tools.

Our objective is to develop a model to provide some insights to the following two questions: (1) is there any temporal pattern

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**Figure 1. The chat functions of WhatsApp**
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