

# Why and How People Use Location Sharing Services on Social Networking Platforms in China

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**Abstract:** Along with the development of information communication technology, there are more and more location sharing services on social networking platforms. Although China has the largest number of internet users in the world, users just started to use location sharing services in the last three years. This study aims to investigate why and how people use location sharing services on social networking platforms in China. To address this, four research questions are presented and 43 in-depth face-to-face interviews are carried out in China. Our results indicated that most users were concerned about privacy issues when they were using location sharing services on social networking platforms. Somewhat surprisingly, some of the interviewees indicated that they were not aware of the availability of the location sharing services on social networking platforms and they did not know how to use location sharing services. Furthermore, with respect to privacy protection, most interviewees indicated that WeChat did a better job than Weibo in China. Lastly, the results revealed that users wanted to use authority management to deal with private issues raised by the shared location information on social networking platforms.

## 1 INTRODUCTION

Along with the development of information communication technology, location based services on mobile devices are getting more and more popular ((Gao, et al. 2014) (Gao, et al. 2015)). There are an increasing number of mobile applications on social networking platforms that can sense and share users' location information with others. We have seen a significant amount of research conducted to understand users' location sharing privacy preferences when they are using location sharing services on social networking platforms (Lin et al. 2013). For example, Lindqvist et al. (2011) has studied why people use the location sharing application Foursquare. Zhu (2012) has investigated the privacy have social effects of location sharing. However, we found that the usage of location sharing services has been mainly studied in developed countries in the last few years. The usage of location sharing services in developing countries is still an open research question. Thus, we aim to investigate why and how people use location sharing services on social networking platforms in China.

Social networking services are getting more and

more popular in China. Weibo (a Twitter-alike service in China) and WeChat (one of the most popular instant messaging services in China) are the two of most popular social networking services in China. Unlike the service of automated tracking (Li et al., 2013), users can choose whether to attach their location information with the messages or photos on social networking platforms. According to the 2013 annual report from China Internet Network Information Center, the users of Weibo and Wechat reached a penetration rate of 43.6% and 65% at the end of 2013 in China respectively.

The objective of this study is to examine why and how users use location sharing services on social networking platforms (e.g., Weibo and Wechat) in China. To address this, four research questions are presented and 43 in-depth face-to-face interviews are carried out in China. The remainder of this paper is organized as follows: the literature review is provided in Section 2. Section 3 proposes the research questions. This is followed by the illustration of the research method in section 4. The research findings are presented in Section 5. In section 6, we conclude this study with a discussion on the research findings and an outline for future

research directions.

## 2 LITERATURE REVIEW

The related literature is discussed in this section.

### 2.1 Contextual Integrity

In order to investigate how people use location sharing services in social networking platforms and how people concern about private issues in the process, the theory contextual integrity is used. The contextual integrity proposed by Nissenbaum (2004) is based on two principles. Firstly, people are living in various social contexts; and secondly, every context has a set of social norms matching with it. Moreover, Nissenbaum (2004) identified two types of information norms. The first norm is appropriateness, which measures whether the disclosure of information is proper in a certain context. The information type (Barth et al., 2006) is a factor to judge appropriateness. The second norm is distribution, which decides whether the distribution of information is allowed under the conditions and restrictions in the flow of information. The contextual integrity asserted that the reason for privacy issues is the violation of appropriateness or distribution principles.

In this study, the contextual integrity is used to clarify the privacy concern on the location sharing service on the social networks by exploring whether the violation of the appropriateness or distribution principles has accrued and how do people deal with private concerns.

As shown in Table 1, contextual integrity has been widely used to study about the internet privacy issues in the previous studies. Lipford et al. (2009)

investigated privacy mechanisms on social network sites and examined privacy issues with the following four elements: profile, photos, newsfeed and the application platform. Grodzinsky et al. (2010) researched personal bloggers' privacy issues.

### 2.2 Privacy Concerns in Location Sharing

Several researchers have examined the privacy issues in location sharing services on social networking platforms. We found that the most studied platform was Foursquare. In-depth interviews and surveys were most used in previous studies (Lindqvist et al. (2011)). While people are sharing their locations on social networking platforms, the personal information of where you are and what you are doing at a certain time are disclosed. Cramer et al. (2011) examined the conflicting norms in check-in services. The results indicated that these norms about when and where to check-in sometimes conflicted with each other since people might have different motivations in using check-in services. Furthermore, privacy attacks in location sharing services on social networking platforms were studied by Kostakos et al. (2011). The result indicated that users who were most likely to know your real location were the users who communicated most frequently with you. Last but not least, Tsai et al. (2010) investigated the privacy in the perception of risks and benefits on social networking platforms. The results revealed that people cared about privacy control mechanism on social networking platforms.

This research aims to complement and extend existing research by focusing on the use of location sharing services on social networking platforms in China. It is a continuing effort by applying context

Table 1: Literatures used contextual integrity to study about the Internet privacy issues.

Literature	Research Purpose	Theory Used	Findings
Lipford et al (2009)	Investigate privacy mechanisms on social network sites	Contextual integrity	The way to design a better privacy mechanisms is to make the flows of information visible.
Grodzinsky et al. (2010)	Research personal bloggers' privacy issues	Contextual integrity	The privacy of these whose name are on the personal bloggers of others has been violated
Shi et al. (2013)	Check the privacy concerns of Friendship Pages	Contextual integrity	Users' interpersonal privacy concerns can arise if contexts, actors, attributes and transmission principles are violated or changed in context-relative information norms
Zimmer (2008)	Clarify the private threats of google search	Contextual integrity	Google's quest for the perfect search engine has changed personal information flows. So that private are threatened

integrity to study users' privacy concerns in using location sharing services on social networking platforms in China.

### 3 RESEARCH QUESTIONS

The objective of this research is to understand how users use location sharing services on social networking platforms in China. As indicated in the last section, previous research found that privacy is a barrier to influence the use of location sharing services on social networking platforms. Further, we would like to use the theory of contextual integrate to further investigate the norms of location information sharing on social networking platforms in China.

Our research questions are as follows.

1. What is the motivation for people to use location sharing services on social networking platforms?
2. Why do some users not use location sharing services on social networking platforms?
3. When and where do users tend to share their location?
4. How do people deal with the private concerns? What is users' preference on using location sharing services on different social networking platforms (e.g., WeChat, Weibo)?

### 4 METHODS

To address the four research questions proposed in Section 3, we conducted a qualitative research in terms of interviews in China. We recruited the interview participants by posting announcements on social networking platforms in the biggest city in the central part of China in October 2014. Fifty users agreed to participate in the interview. However, some users did not appear in the scheduled interview time slots. As a result, we had conducted 43 in-depth face-to-face interviews with users of social networking platforms in China. The interviews were semi-structured and also included a set of open questions for all interviewees. Each interview lasted around 25 minutes. The interviews were recorded and the notes were taken. The transcriptions and notes were analysed by using open coding.

Among the participants, 27 (numbered as A1 to A27), had some experience with using location sharing services on social networking platforms. 16 (numbered as A28 to A43) of the participants were users of social networking platforms. However, they

never used location sharing services on social network platforms before. For this group of users, we explored the reasons behind that by asking some open questions. 20 of the participants were male, and 23 were female. 3 of the participants are under 20 years old, and 40 of them are between 20 and 25.

### 5 RESEARCH FINDINGS

The research findings are presented in this section.

#### 5.1 Motivations to Use Location Sharing Services

The frequent indicated motivations during the interviews were summarized as follows: 1).telling friends where the interviewee has been (the most indicated), 2).arriving at a new place or doing something interesting, 3). being at a place where is fun to tell his/her friends. The purpose is to inform their friends about the change of his/her geographic location. However, sometimes, people check-in at a place where they are not actually in (A6), "Sometimes, I checked-in to cheat on my boyfriend, Actually, I was not there". This means that the location information can be edited by the user.

Sometimes doing something romantic can enable users to share location information on social networking platforms. A11 shared his location in a cinema because he was with his girlfriend at that time. He said that he tended to share the location when he was dating with his girlfriend. Visiting places of interest can also motivate users to use location sharing services on social networking platforms. Some people shared location information to record their daily routines in their personal life. A14 said that, "I checked-in when I wanted to share my daily routines with my friends".

#### 5.2 Why People Do Not Share Their Location Information?

There are 16 interviewees never used location sharing services on social networking platforms before. Six of them indicated that they never heard of this service or did not know how to use this location sharing service (A34, A36, A37, A40, A42, and A43). Three interviewees indicated that they thought sharing location is useless and meaningless (A28, A29, A33). There were also 5 interviewees who worried about the privacy and safety issues raised by using location sharing service (A30, A35,

A39, A40, A41). A30 mentioned that “I don’t like the feeling of being watched by sharing my location information on social networking platforms”. A35 said that, “In some cybercrime cases, location information on WeChat or Weibo were used to find the object”. Further, four interviewees indicated that they were concerned about privacy issues in some circumstance. For example, they did not want their location information to be seen by their parents.

### 5.3 The Information Norms of Sharing Location

Information norm is an important concept in the contextual integrity theory. It represents the norm of where and when to share location in the general accepted way.

#### 5.3.1 Where Do People Check-in?

Interviewees were asked to rank the types of locations that they were likely to share according to their past experience. The ranking scores of each type of location were presented in Figure 1.

It can be seen from the bar chart that the users were most likely to share their locations at tourism scenic areas. The event scenes and entertainment venues have the same score, both of which are the second frequent places to check-in. The third most likely check in location is the places for working and studying. Home was ranked as the most unlikely place to be shared by end users.

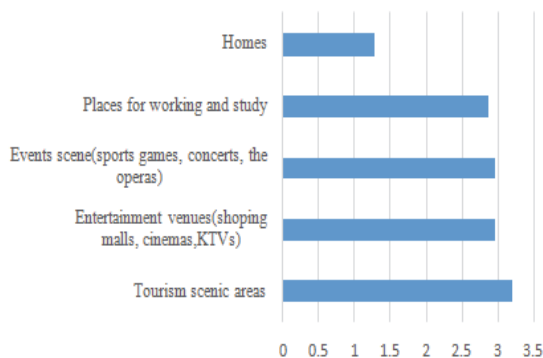


Figure 1: The ranking scores of each type of location.

The findings from Section 5.1 are of help to further explain the results in Figure 1. The most indicated motivation is to tell friends where the interviewee has been. The tourism scenic areas are often the places of interests. Users are interested to share this information to their friends. Entertainment venues and event scenes are places that are fun and appropriate for sharing information on their daily

life. The places for working and study and home are regarded as users’ routine places. According to the results, it seemed that end users did not like to share location information of their routine places.

#### 5.3.2 When Do People Check-in?

Participants A2, A12 and A13 indicated that they intended to share their location information on social networking platforms when having group events. A7 and A24 tended to check-in when they felt funny about new places. A1, A3, A4, A10, A11, A25 and A26 shared their location information when they arrived at a place of interest.

#### 5.3.3 What Information Can Be Gained in Friends’ Shared Location Information?

Figure 2 presents the information that their friends wanted to know by viewing the shared location. All the participants chose the option “where my friend has been”. 46% of the interviewees believed they could know their friends’ opinions of the places. 15% of the interviewees chose the option “others”. Moreover, A21 and A22 indicated that, “I can guess what my friends are doing lately”. A5 mentioned that “he is able to know the status of his friends according to the location information shared on social networking platforms”.

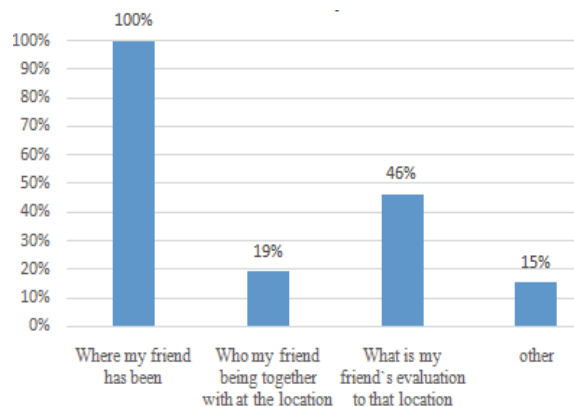


Figure 2: Information gained from friends’ shared location information.

### 5.4 Applying Contextual Integrity to Analyze the Privacy Concern

#### 5.4.1 Potential Audiences

In the theory of contextual integrity, inappropriate audience of a certain context could invade privacy

(Barth et al., 2006). When the participants were asked about potential audiences, they tended to use authority management (A11, A13) to deal with private issues with potential audiences. Six interviewees said that, “If I do not want some friends to see my location, I will block them to see my location information”.

Figure 3 presents the privacy concerns of the interviewees who have used the location sharing service. Three of them said that they did not have privacy concerns on using location sharing services on social networking platforms. 63% of the interviewees indicated that they were worried about the issue that the shared location information could be accessed by some unknown merchants. 58% of the interviewees were afraid that the location information could be seen by some unwanted friends. 42% of the interviewees were concerned about tracing by others, while 21% of the interviewees were concerned about possible security issues raised by strangers on social networking platforms.

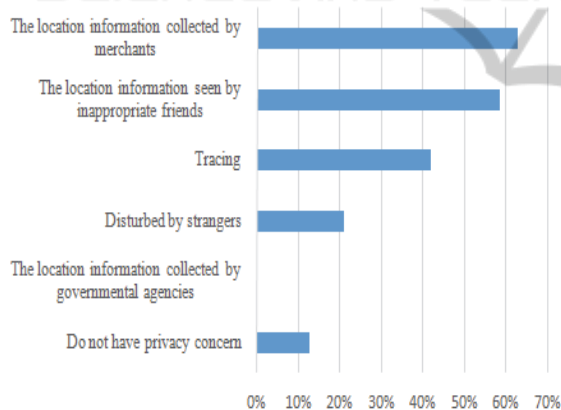


Figure 3: Privacy concerns of the interviewees who have used the location sharing service.

#### 5.4.2 Violation of Appropriateness

According to the previous research (Barth et al (2006)), the type of information can influence people’s judgment on whether the appropriateness principle has been violated. When the users’ current location is regarded as private, they are less likely to disclose the location information to others.

When it comes to the appropriateness, interviewees were asked to compare the difference between WeChat and Weibo. Most interviewees believed that WeChat did a better job than Weibo with respect to the privacy issue (A2, A5). The message posted on WeChat can only be seen by verified friends, while the message posted on Weibo

can be seen by anyone. The number of interviewees who tended to check-in on WeChat (44.4%) is more than the number of interviewees who tended to check-in on Weibo (18.5%).

#### 5.4.3 Violation of Distribution

The principle of distribution is another important concept in the contextual integrity theory. According to the interviews, 13 users indicated that they did not have private concerns when they were using location sharing services on social networking platforms. A1 said, “I don’t have privacy concerns because I never shared private location information on social networking platforms”. Some interviewees who have privacy concern said that they would ask his friends to not re-post his messages any more or delete the message (A3, A12, A13, A15, A19, A21). Other interviewees (A10, A18, and A23) chose to limit their check-in behaviour because of possible distribution of the shared private location information.

## 6 CONCLUSION AND FUTURE WORK

Our interviews with 43 users shed interesting insights into how and why users use of location sharing services on social networking platforms in China. Four research questions were addressed in this study. The key findings from this study were summarized as follows. Firstly, our findings indicated that most users were concerned about privacy issues when they were using location sharing services on social networking platforms. This is in line with the previous research (e.g., Lindqvist et al. 2011). It suggests that the service providers need to setup clear interpretations on how users’ privacy concerns are protected in using location sharing services on social networking platforms. Secondly, we found many motivations as to why users use location sharing services, including fun, connecting with best friends, remembering daily routines in peoples’ life. Thirdly, somewhat surprisingly, some of the interviewees did not know the location sharing services on social networking platforms and did not know how to use them. The social networking services providers need to have some marketing campaigns to further promote location sharing services to the end users. Fourthly, with respect to privacy protection, most interviewees indicated that WeChat did a better job than Weibo in China. Last but not least, we found that users wanted

to use authority management (A11, A13) to deal with private issues raised by the shared location information on social networking platforms.

However, we were also aware of some limitations of this research. First, the sample in this study was quite narrow in terms of age range since all participants in our interviews were under 25 years old. This sample might not be fully representative of the entire population in China. For example, the generalizability of the findings to other groups of users (e.g., older adults) remains to be determined. Second, the self-reporting nature of this study is another limitation. Last but not least, we only studied location sharing services on two popular social networking platforms in China. This may limit the generalizability of our findings.

Continuing with this stream of research, we plan to test other age groups to see the generalizability of our findings in this study. Future research is also needed to empirically examine potential factors influence users' adoption of location sharing services in terms of a research model with larger samples in China. We also would like to record users' historical behaviour on using location sharing services to further analysis users' usage patterns.

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