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EXPLORING THE PUBLIC'S PERCEPTION TOWARDS CROWDSOURCED CRIME REPORTING

Wan Mohamad Luqman Wan Abu Bakar¹, Badariah Solemon²

¹Universiti Tenaga Nasional, Malaysia, mLuqman@uniten.edu.my

²Universiti Tenaga Nasional, Malaysia, badariah@uniten.edu.my

ABSTRACT. This paper presents the results of an exploratory study conducted to investigate the public perception towards crime information shared by the crowds. Information required for the study was obtained through a survey, self-administered questionnaires distributed to the crowds in public areas including shopping mall, food court, mosque, and institutes of higher learning in Selangor, Malaysia as well as those posted on an online survey website. The results from 139 valid responses show that the crime rate is perceived to have been increasing and crime information is often shared on social media, mobile messaging applications, mobile applications and online newspapers. However, most respondents do not show high confidence and trust levels with the crime related information shared in these technologies particularly from mobile messaging application. Also, majority of the public believe that the current protection level in their community by the police force show no significant difference than before. Findings from this survey is very important in designing future crime prevention technologies that provide insight to the public with crime related information, which would lower their chances of being targeted.

Keywords: crowdsourcing; crime reporting; crime perception

INTRODUCTION

Crime is a circumstances that has various cumulative effects on the aspects of finance and psychology such as the loss of property, insurance, justice, victimization and security (Andresen and Jenion, 2008), while perception of crime is a psychological perception of society about their safety towards crime. The perception of crime has been noted as one of the indicators to measure the success of combating crime. Perception of crime may affect the society when people's daily routine disturbed as they are too scared to socialise and do business. Also, the public perception of crime indicates confidence of public towards the police force and the government. As stated by Marzbali, Abdullah, Razak, and Tilaki (2012) fear of crime issue was mentioned as a critical issue in Malaysia when compared against the problem of actual crime itself by the Deputy Commissioner of Police (DCP) Dato' Hadi bin Abdullah during the sixth Crime and Policing in Malaysia forum in 2010. The term 'fear of crime' has been matched with a variety of emotional states, attitudes or perceptions including mistrust of others, anxiety, perceived risk, fear of strangers, concern about deteriorating neighbourhoods or declining national morality (Warr, 2000). According to Pain (2000) fear is the manifestation of a feeling that one is in danger. Fear of crime has a relationship with emotional reaction such as feeling of fear and wariness towards any action that may cause injury as a result of being assaulted.

Hence, fear of crime can influence public crime perception and makes people have a false sense of insecurity, independent of crime itself and usually occurs at higher rates than recorded victimization. The fear of crime is influenced by the media such as newspapers and also alternative online media. According to Sandstig (2010), media reinforce the public personal experience and social experience towards crime. He also discovered that those that believe media coverage on crime is understated have a greater feeling of fear and insecurity. Therefore, crime prevention actions should be undertaken to reduce the incidences of crime as well as the fear of crime.

Some studies in Latin and Brazil had demonstrated that web and mobile applications facilitate in reducing the number of crime violence in the local area. With these technologies, the public are now enabled to alert others who are within the neighbourhood of the crime incident. The information may also guides different group of people make decision. For instance, travelers require of this information to review the safety of local neighborhood, before making decision to visit such place (Fortis, Buhalis, and Rossides, 2011). In addition, the information also helps business investors to evaluate the possible risk associated to any potential investment area. Local residents utilize the information to help them informed with the latest crime incidents in their neighborhood. Thus, according to Kadar, Rosés Brüngger, and Pletikosa Cvjikj (2016), crime prevention technologies that utilise of this insight provide potential victims with crime related information which would lower their chances of being targeted.

A smart mobile device nowadays is included with the ubiquity of location sensing and has great potential in providing valuable information about crime incidents in a neighborhood. Smart mobile devices can ease the geo-tagging of photograph and video media with GPS points, which can help users to find location-specific information in the geo-tagged media (Larson et. al., 2011). Although location and time information via various geo-tagged media is importance in understanding crime, such information is considered as private (Iachello and Hong, 2007; Tsai, Kelley, Cranor, and Sadeh, 2009; Myles, Friday, and Davies, 2003) and sensitive for many users (Tsai, Kelley, Cranor, and Sadeh, 2009). Therefore, before we design a new mobile location-based crowdsourcing platform for sharing crime incidents information, we conducted a survey to investigate how its use is perceived by the public who participates in crowdsourcing. Also, we would like to understand what motivate people and communities to participate in crowdsourcing of crime information.

The remaining of the paper is organized as follows. Section 2 explains the materials and data collection methods used in the survey. Section 3 discusses the results and findings obtained from analysis of valid responses of the survey, and lastly, some concluding remarks and recommendations for future work are made in Section 4.

MATERIALS AND METHOD

There are two main objectives of the survey: 1) To investigate the pattern of the public's perceptions towards crowdsourced crime related information and crowdsourcing platforms for sharing crime incidents information; and 2) To identify the factors that motivate people and communities to participate in crowdsourcing of crime information. Due to limited space, this paper focuses at presenting the results and findings of the first objective only. To achieve the first objective, the following research questions (RQs) were investigated:

- RQ1: What are the perceived levels of crime incidents, sense of safety, and police protection in the community?
- RQ2: What are the technologies used to share crime-related information and their usage frequencies?

RQ3: What are the perceived level of confidence and trust on the shared crime information?

RQ4: What types of crime were often reported in the neighborhood area during the last twelve months?

Questionnaire was chosen as the instrument of the survey. A new set of questionnaire was constructed from scratch for the survey based on the research questions. The questionnaire was constructed with three sections to capture the required information: Section A, Section B, and Section C based on the two objectives abovementioned. Section A contains nine questions (Q1-Q9) asking for the background information and respondent's profile. Section B contains eight questions (Q10-Q17) asking for perceived crime related information including types of crimes reported in the neighborhood area during the last twelve months, level of crime and level of police protection in the community, frequency of coming across with shared crime-related information in relevant technologies as well as the level of confidence and trust on the shared crime information. Section C contains five questions (Q18-Q22) on motivation factors to participate in crowdsourced crime reporting and sharing, and geo-tagging of media content. This paper aims to present only the results of the first two sections.

To avoid responder bias, a pilot study was conducted to the constructed questionnaire involving five participants from the public, who were chosen based on convenience random sampling. The pilot study ran a test on each item in the questionnaire against four test points, which are similarly tested in Berry and Jeffery (2000) and Beecham, Hall, Britton, Cottee, and Rainer (2005a). Particularly, the pilot test assessed respondents' level of understanding, level of knowledge, level of difficulty in responding, level of relevance to subject area, and level of time commitment required to complete the questionnaire. Responses to the pilot test were examined and changes were made as a result of the received feedbacks.

The population of the respondents is hard to be determined as there is no clear basis to identify them. Therefore, the participants are selected because of their convenient accessibility and proximity to the researchers. A total of 194 respondents participated in this survey. Approximately 158 respondents were obtained from the crowds in public areas in Alamanda Shopping Mall, UPTEN food court, Al-Azhar Mosque, Universiti Tenaga Nasional, and International Islamic University College in Selangor. Another 36 respondents participated in the web survey. The survey was conducted in five-week period from 19th October 2015 to 16th November 2015). The participation list was finalised only after the data provided were verified. The process to verify the data provided was performed in ensuring the internal validity of data provided in the questionnaire. A few additional responses were received after this date, however, they were excluded because the analysis had already commenced. Out of 194 responses received, only 139 responses are complete and deemed valid for analysis. The other 55 responses were considered invalid mainly due to missing information particularly from Section B and C.

RESULTS AND DISCUSSION

Majority of the respondents (60%) are female aged between 21-25 years old and above 31. Almost 30% of the respondents are working in government/GLC sector, while another one-third of them (32.3%) are students studying in the abovementioned university and university college. Almost 30% of the respondents spent 1-3 hours per day on the Internet, while another one-third (27.3%) of respondents spent 3-6 hours per day. The top two preferred devices to connect to the Internet are smartphone and laptop.

Respondents were asked to share their perceived level of crime in their neighborhood area, and almost 70% of respondents agreed that crime level has increased and are showing an upward trend. Slightly almost half of the respondents (46%) agreed that crime has increased a

lot in their community and another 23.7% agreed that crime has increased marginally in their community. Another 10.8% of respondents answered crime is about the same, while the balance 11.5% of respondents answered ‘Don’t know’. Almost 40% of the respondents suggested that police protection level in their community for the past 12 months is about the same, despite another 26.6% of respondents considered police protection level in their community has increased a little. Table 1 lists perceived sense of safety of the respondents in their community area at a particular place and time. Each item in the question has an ordinal four-point Likert scale (1=very unsafe, 2= unsafe, 3=safe, 4=very safe). The fourpoint Likert scale data were collapsed and dichotomised as either ‘supportive’ or ‘critical’ responses. The respondents generally feel safe at home both during the day and night. However, majority respondents (65.5%) feel unsafe when going out at night in their community area. These results provide the answers for RQ1.

Table 1. Perception on Safety

How safe do you feel...	N	Critical Response	Observed	Supportive Response Percentage	Overall
In your community	137	52	85	Safe = 80(57.6%) Very safe = 5(3.6%)	61.2%
Going out during the day in your community	138	52	86	Safe = 79(56.8%) Very safe = 7(5.0%)	61.8%
Going out at night in your community	139	91	48	Safe = 47(33.8%) Very safe = 1(0.7%)	34.5%
At home during the day	139	22	117	Safe = 92(66.2%) Very safe = 25(18.0%)	84.2%
At home at night	139	41	98	Safe = 79(56.8%) Very safe = 19(13.7%)	70.5%

In an attempt to find answers for RQ2, respondents were asked to rate how frequent they came across with crime-related information shared using different technologies including social media (e.g.: Facebook, Twitter, Blogs, Youtube), mobile application (e.g.: MalaysiaCrime, Enforce Crime Map), mobile messaging application (e.g.: Whatsapp, Telegram), online newspaper (e.g.: The Star Online) and web-based application (e.g.: Safe City Monitoring System). Each item in this question has an ordinal five-point scale (1=never, 2= occasionally, 3=sometime, 4=often, 5=always). The results listed in Table 2 show the three technologies often and always used in acquiring and sharing crime related information are social media (49%), mobile messaging application (51.6%) and online newspaper (41.72%). Surprisingly, a big percentage of respondents have never use mobile application (26.74%) and web-based application (35.04%) to acquire and share crime related information.

Table 2. Frequency in Discovery of Crime Related Information Using Technologies

Technology	N	Never	%	Occasional	%	Sometime	%	Often	%	Always	%
Social Media	139	4	2.88%	10	7.19%	43	30.94%	58	41.73%	24	17.27%
Mobile Application	137	38	27.74%	28	20.44%	39	28.47%	29	21.17%	3	2.19%
Mobile Messaging Application	139	9	6.47%	17	12.23%	41	29.50%	50	35.97%	22	15.83%
Online Newspapers	139	17	12.23%	22	15.83%	42	30.22%	45	32.37%	13	9.35%
Web-based Application	137	48	35.04%	29	21.17%	39	28.47%	20	14.60%	1	0.73%

To partially find answers for RQ3, respondents were asked to rate the level of confidence they feel on the shared crime information. Each item in the question has an ordinal six-point

scale (1=not confident at all, 2=not confident, 3=somewhat confident, 4=confident, 5=very confident, 6=completely confident). Majority of the respondents feel confident with the crime related information shared in social media (30.6%), online newspaper (57.5%), web-based application (40.4%) and mobile application (40.8%). Although almost half of the respondents have used mobile messaging in acquiring and sharing crime related information, 30% of respondents do not feel confident with the shared crime information.

Then, respondents were further questioned to rate the level of trust they feel on the shared crime information. Each item in the question has an ordinal six-point scale (1=no trust level, 2= low trust level, 3= medium trust level, 4= high trust level, 5= very high trust level, 6= complete trust level). The results show that most respondents feel medium trust level only with the crime related information shared in all technologies listed. In the social media technologies, majority of respondents (60.4%) feel medium trust level and about 26.9% of respondents feel no to low trust level. About 45.9% of respondents feel medium trust in mobile application technology and 28.6% of respondents feel high to complete trust level. In mobile messaging application, about 45.4% of respondents feel medium trust level and 39.2% of respondents feel no to low trust level. Whereas majority of respondents (52.0%) feel high to complete trust level and 36.4% of respondents feel medium trust level. In web-based application technology, about 44.9% of respondents feel medium trust level and 33.8% of respondents feel high to complete trust level.

Finally, we asked respondents to rate how frequent they came across with different types of crime-related information using an ordinal five-point scale (1=never, 2= occasionally, 3=sometime, 4=often, 5=always). Most of the respondents sometime came across with all types of crime as shown in Figure 1. The types of crime include a) burglary, b) fraud, c) auto theft, d) larceny from auto, e) larceny, f) vandalism, g) assault, h) robbery, i) sexual assault, j) crimes against children. From the survey results, it can be observed that the top four types of crime our respondents always came are vandalism (36.2%), robbery (34.6%), sexual assault (34.1%), and crimes against children (33.3%). However, the results also show a quite puzzling pattern since almost one third of the respondents have never come across with those types of crime. Also, it can be observed that the majority of the respondents (54%) had participated in crowdsourced crime reporting and sharing activities.

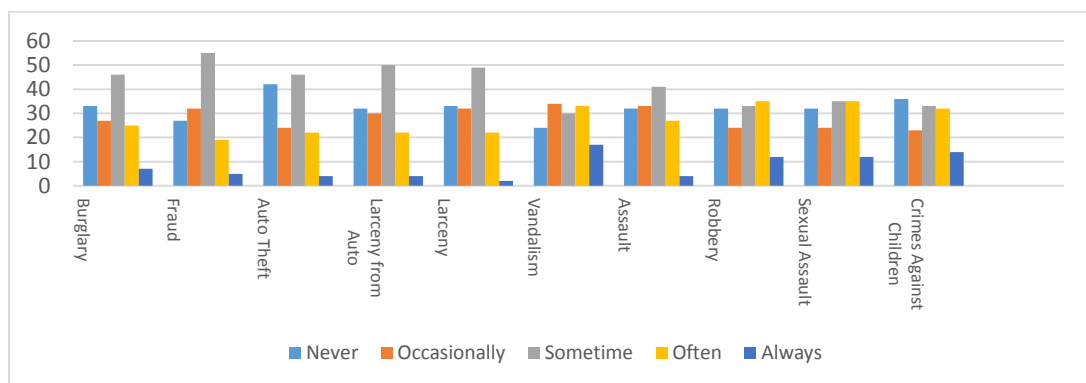


Figure 1. Types of crime often reported

CONCLUSION AND FUTURE WORK

This paper presents the results of a survey conducted to investigate the public perception towards crime information shared by the crowds. The results from valid responses show that

the crime rate is perceived to have been increasing and majority of the respondents believe that the current protection level in their community by the police force show no significant difference than before. Also, crime information is often shared on social media, mobile messaging applications, mobile applications and online newspapers. However, most respondents do not show high confidence and trust levels with the crime related information shared in these technologies particularly from mobile messaging application. Findings from this survey have guided a research work to develop a prototype of mobile application to demonstrate how the platform can support neighborhood crime watch activity by enabling community members to share crime incidents information and receive near real-time alert of crime incidents that occur within certain radius.

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