Social Media - New Face of Collaborative Policing?
A Survey Exploring Perceptions, Behavior, Challenges for Police Field Officers and Residents

Niharika Sachdeva, Ponnurangam Kumaraguru
Indraprastha Institute of Information Technology – Delhi
niharikas@iiitd.ac.in, pk@iiitd.ac.in

Abstract. Online social media (OSM) has become a preferred choice of police to communicate and collaborate with citizens for improved safety. Various studies investigate perceptions and opinion of high ranked police officers on use of OSM in policing, however, understanding and perceptions of field level police personnel is largely unexplored. We collected survey responses of 445 police personnel and 204 citizens' survey in India to understand perceptions on OSN use for policing. Further, we analyzed posts from Facebook pages of Indian police organizations to study the behavior of police and citizens as they pursue social and safety goals on OSN. We find that success of OSN for policing demands effective communication between the stakeholders (citizens and police). Our results show preliminary evidences that OSM use for policing can help (1) increase participation in problem solving process, (2) increase community engagement by providing unique channel for both Feedback and Anonymity. However, such a system will need appropriate acknowledgment and trustworthiness channels to be successful. We also identify challenges in adopting OSN and outline design opportunities for HCI researchers and practitioners to design tools supporting social interactions for policing.

1 Introduction
Crime and safety issues disquietude most urban communities. Collaboration between police and residents often play a significant role in addressing crime and safety issues in varied context including Hurricane and fires [5, 13]. In such collaborations, Online Social Media (OSM) is a preferred technology (see Figure 1) as it provides massive civic engagement and social support [3, 4, 19, 22, 28]. OSM role becomes even more significant for developing region with limited police staff. UN guideline suggests 270-280 police-personnel per 1,00,000 residents whereas developing countries like India have 130 personnel per 1,00,000 residents [7]. Realizing the potential of OSM, Indian police have started exploring its use for day-to-day policing.

Literature extensively studies human behavior, perception and OSM adoption for policing in crisis and post-crisis situation[3, 5, 13, 19, 22, 28]. However, OSM use for day-to-day policing is largely unexplored. Few HCI studies that explored OSM in day-to-day policing investigated the opinion of command ranked officers (involved in the decision-making) but lack the understanding of field officers (who execute the decision) [1, ?]. Criminology research shows that field officers are the first point of contact and have maximum interaction with residents [23]. Therefore, understanding perceptions of field officers are necessary to improve collaborative policing. To understand
OSM use for policing, we use a multi-stakeholder approach involving surveys of 445 police officers and 204 residents (Demographic details in Table 1). We analyze perceptions, behavior, and challenges experienced by police-personnel and residents while interacting on OSM. This includes investigating that why police and resident use OSM, what are their concerns, hindrances, and expectation as they interact on OSM.

Our work makes following contributions:

- We found that OSM can improve transparency in problem solving process by offering an open platform to engage communities for discussing safety issues / activities. However, we found residents and police differ on activities to be discussed on OSM. Top three activities for residents were – notifying about crime, emergency or disaster related issues, and crime prevention activities. Contrastingly, police-personnel preferred crime investigation, intelligence, and reputation management.

- We showed that the preferred OSM were Facebook and WhatsApp. Even though the preferred platforms for both were the same, we observed significant difference between officers and residents for choice of other OSM ($\chi^2$ test, p-value $< 0.001$).

- We identified two distinct opportunities – Feedback mechanism and Anonymity to increase community engagement. Our results show that anonymity offered by OSM could help obtain more information from residents.

- We identified two deterrents to community engagement – lack of acknowledgement and trust. Residents (32%) said that police should provide acknowledgement with an hour of residents posting the message. With limited resources, this can overload the police but to sustain collaboration, acknowledgement may be an effective tool.

- We suggest technological and design opportunities for effective community engagement and to innovate policing through OSM.

2 Related Work

Recent studies show increase in need of OSM as a plausible resource for police forces [6]. Police in developed nations have realized effectiveness of OSM in various activities such as investigation, identifying crime, intelligence development, and community policing [6, 15, 18]. However, interactivity and pace at which information diffuses on OSM
results in additional pressure on police departments [6]. We found that police departments in developed countries have made reasonable efforts and progress to adopt OSM, whereas developing countries are still evolving skills to use OSM for policing [24]. Developing nations like India are not untouched from the influence of OSM. India has 92 million Facebook users (7.73% of total Facebook user base) who are spread across both major (34% of user base) and small cities (24% of user base) of the country [21]. Various studies in Indian context showed that OSM was used to spread misinformation and public agitation during crisis events such as Mumbai terror attacks (2011), Muzzafarnagar riots and Assam disturbance (2012) [8, 17, 30]. In both the events (Assam, and Muzzafarnagar riots), panic was spread through fake images, messages, and videos on OSM [30].

Existing studies have shown effectiveness of OSM for crises like Boston bombings, Sichuan earthquake (2008), Haiti earthquake (2009), Oklahoma grassfires (2009), and Chile earthquake (2010) [9, 10, 20, 25, 29, 31]. These studies demonstrate that OSM could provide critical real time information and reduce misinformation during crisis events. Researchers found that citizens used OSM for public coordination during crises. They categorized public response received during crisis on OSM and showed different communities which developed during crises [11, 14]. We found few studies which analyzed police – public use of OSM [27, 5, 12]. Studies showed that police organizations need effective communication strategy to provide timely information to various groups [2]. These studies provide insights on different strategies and activities police perform on OSM. However, these provide little insight about police rationale and expectations behind these actions and citizen acceptance of these actions. Surveys showed that OSM introduced challenges for police officers such as fake / impostor accounts which target law enforcement agencies, security and privacy concerns, civil liabilities and resource constraints like time, and staff [15, 18]. Another challenge was easy accessibility of OSM to malicious people, which could make sharing information with citizens a complex task [5]. Very few studies analyze citizen and police perceptions / concerns which lead to these challenges. However, these studies analyse the behaviour of higher ranked police officers and not of the ground staff who interact with the citizens more often. To best of our knowledge, this is the first study, which analyzed police personnel (ground staff) and citizen behavior / expectation regarding OSM use for policing. We present expectations gaps between police and citizens on OSM use for policing. We believe the insights from our study would provide opportunities to develop better communication strategy for police and motivate technologist to build secure system designs for effective policing using OSM.

3 Background

In this section, we give a qualitative review of different kind of posts made by different police departments in India. We found that police activities mainly include maintenance of law and public order, crime prevention and detection, traffic management, and enforcing laws of the land. To perform these activities police departments require active and dynamic interaction / participation from citizens. We found that police in India used OSM tasks such as traffic management, posting personal achievements and appreciation
received by citizens. These pages also highlighted security conditions in disturbed / riots affected areas, educate citizens about current beat (patrols), and safety programs undertaken by city police. Figure 2 shows tag-cloud of most frequent words of posts and comments on these pages. Bangalore City Police (BCP) page provided one such platform to report issues related to policing. Figure 2(a) shows popular discussions on Bangalore City police page were regarding phone / mobile, finance problems, issues on roads, traffic, drivers, buses, lost objects, and First Information Reports (FIR). The comments below show complaints filed on OSM police pages.

Respected Commissioner, I wish to inform FIR No.07XX/20XX is registered in H.A.L. PS.GSC No. is PXXX61301XXXXX. Registration No.: KXXX5HXXX, Chassis No.: ME11CK0XXX, Engine No.:1XX2011XXX, Bike Model: Yamaha R15 white color, Phone: 8XX886XXXX & 80XX39XXXX.

People addressed various authorities like inspectors and commissioner to file complaints and inquired about time constraints in which problem could be solved / addressed. To further understand citizens’ view, we analyzed comments on BCP page. Mostly people reported issues in polite words – request, please and addressed officers as “Sir” (see figure 2(c)) but some people made rude statements about police. We found people thanked police, appreciated their work and inquired about action taken, and nearest station. Some examples below:

Great !! absolutely great !! Reading all the complaints and statuses. I am so very happy that police is doing great job in helping people via FB as well

People posted sensitive information and crime tips on Bangalore City Police page such as drug dealers active in the city, people in serious distress, and money laundering issues.

Drug dealer X. Phone number is 9XX02XXXXX. Please track him down. Selling ganja/ pot/ weed/ marijuana.

Chennai police page, a relatively new page, was dedicated to city issues. Posts included questions regarding police action taken, complaints about phone, money, shops, traffic issues on roads, and few posts were regarding blackmailers. Figure 2(b) shows frequent words in these discussions. On analyzing comments on this page, we found popular topics were about blackmailers, money, police and station. We found some violent reactions on this page, people used words like Kill, torcuring, techniques etc. Outstation people in Chennai also posted their issues like:

We the people of INDIA from West Bengal want to say that some very very dangerous groups want to kill many poor Indians for MONEY.
Delhi police did not have city police page but maintained a traffic police page. We analyzed this page and found that popular issues were traffic, vehicles, people, and car. Delhi police appreciated citizen participation for informing them about routine problems and also provided assistance if needed.

Thanks, matter will be looked into and you may also contact to TI/XXX at 87XXX7XXXX.

Similar to Bangalore City Police page, people gave their feedback to Delhi Traffic Police on these pages. Some people regarded these pages as eye wash whereas some people asked for status of their complaints and actions taken. For instance a citizen wrote

You are right XX, but DTP can never improve. FB page is also an eye wash.

People looked disappointed for not getting a reply / action taken against their complains in a given time frame. However, Delhi Traffic Police tried to keep citizens informed about actions taken and also posted other advisories as required. Some examples below:

The following vehicles/owners have been prosecuted by issuing notice on the basis of photographs on dated 08/02/2014 Vehicle no. - Notice no [XXXX]

Citizens also posted a variety of personal information on these pages such as phone numbers, IMEI numbers, and identity cards to report complains on these pages. Sometimes, police departments posted contact details as a reply to these post. People also posted irrelevant content on these pages such as publicity of a political party or general complaints against politicians. So far we analyzed messages on Facebook and Twitter to understand the policing landscape on OSM. This introduced many questions like how much information was useful for police departments, and were there some posts which could create problems for citizens. It was not clear, how OSM could help police departments to achieve their goals and what were the security / privacy / legal implications of sensitive information shared on OSM? Success of police pages could not be measured without understanding citizen’s expectations and satisfaction. We conducted surveys with both the stakeholders to gain insights about experiences with, and expectations from OSM.

4 Methodology

The survey questionnaire was created to understand general activities on OSM for policing, concerns, scope of use, hindrances, and need for policies. To understand why OSM is needed, we asked police personnel questions such as “for which of the policing activities can you use OSN e.g. Facebook?” and options given included choices such as crime investigations, listening / monitoring, notifying the public of crime, and do not use social media tools. We also included Others as an option for police personnel to write their own choice. This list was constructed based on interviews and similar surveys conducted in the developed nations [6].

Next, we surveyed citizens on the use of OSM for policing, concerns regarding police presence on OSM, and activities that police can perform using OSM. For instance, we asked citizens for which of the following activities should police use OSM e.g. Facebook? and showed them same options as shown to police personnel. To understand the challenges and expectation on how citizens will like to communicate with police
on OSM, we asked how would you like to communicate information (e.g. complaints and feedbacks) to police using Online Social Media? Participants could choose to post anonymous information, post on police page with minimal personal information e.g. email id, send direct messages, create a fake account to inform police, or would use police pages to get information only.

In total, we collected responses from 445 police personnel and 204 citizens. Table 1 shows the demographics of the survey participants. Our questionnaire included demographics questions such as age, gender and profession of the participants. We administered surveys via services such as Google forms and Survey Monkey. The number of male police personnel in our survey is dominant, however male and female ratio in our survey, is representative ratio of the genders in Indian police services [16]. Almost equal number of male and female citizens participated in the survey. To compare citizen and police perception, we used the same questions in the two surveys with minimal modification to suit the concerned group. In some questions, we used a 5-point Likert scale ranging from Strongly agree to Strongly disagree to capture participant’s response. Further, we applied statistical tests such as Mann-Whitney U Test to analyze the difference in opinion for survey questions using likert scales.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Resident Survey N=204</th>
<th>Police Survey N=445</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>40.66</td>
<td>8.98</td>
</tr>
<tr>
<td>Male</td>
<td>56.59</td>
<td>85.85</td>
</tr>
<tr>
<td>Not shared</td>
<td>2.75</td>
<td>5.17</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 – 24</td>
<td>80.22</td>
<td>3.05</td>
</tr>
<tr>
<td>25 – 34</td>
<td>16.48</td>
<td>37.79</td>
</tr>
<tr>
<td>35 – 44</td>
<td>0.55</td>
<td>21.36</td>
</tr>
<tr>
<td>45 – 55</td>
<td>0.55</td>
<td>27.93</td>
</tr>
<tr>
<td>55- 65+</td>
<td>–</td>
<td>9.87</td>
</tr>
<tr>
<td>Not shared</td>
<td>2.20</td>
<td>–</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computer IT</td>
<td>54.40</td>
<td></td>
</tr>
<tr>
<td>Teaching / Research</td>
<td>10.99</td>
<td></td>
</tr>
<tr>
<td>Fashion Designing</td>
<td>10.99</td>
<td></td>
</tr>
<tr>
<td>MBA</td>
<td>3.30</td>
<td></td>
</tr>
<tr>
<td>CA</td>
<td>0.55</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>19.77</td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Demographics of the participants in the interviews and surveys. Values in the table are in percentage. Almost equal number of male and female residents participated in the survey.

5 Survey Results

We conducted surveys in the quest for empirical understanding of citizens and police expectation from OSM. These helped clearly quantify the similarities and differences between police personnel and citizens. Community policing requires citizen and police collaboration to prioritize the tasks.
5.1 Transparency in problem solving process

Participants believed that OSM can improve transparency in problem solving process by offering an open platform to discuss crime and safety related issues / activities. We found that citizens were interested in reporting different issues to police through OSM, such as eve teasing (73%), child labour (71.4%), traffic issues (59.9%), domestic violence (57.7%), neighborhood issues (56.6%). This shows OSM can increase the number of community volunteers to identify crime. Citizens agreed that they will like to give feedback (67%) to police through OSM.

![Fig. 3: Citizen (N=204) issues which they will like to report using OSM.](image)

We found different expectation between police and citizen with respect to policing activities can be performed using OSM. Top three activities for which citizens thought police can use OSM were – notifying the public about crime, emergency situation or disaster related issues, and crime prevention activities. In contrast to this, top three activities which police personnel preferred were crime investigation, intelligence, and public relation / reputation management (see Figure 2). We found statistical difference between the citizens and police for preferred policing activities (χ² test, p-value < 0.001).

Survey analysis confirms that OSM offers opportunities for citizens and police identify and improve law and order situation in the society. Police develop better understanding about citizens’ need using the feedback and information available on OSM. For improved citizen satisfaction, police can consider using OSM for notifying the public about crime, emergency situation or disaster related issues, and crime prevention in addition to the activities they will like to perform.

5.2 Community engagement through Feedback and Anonymity

OSM was a preferred platform to give Feedback which provides an opportunity to increase community engagement between residents and police. We asked citizens what will they like to do with a tweet / post with a positive feedback about police organization of your area / Estate, e.g., We thank the police for reducing crime in our city. Citizens could choose to share / retweet, like / favorite, comment / reply, delete, report–abuse/spam or Ignore the message. Almost 65% citizens said that they will like or favorite the post with positive feedback and 30.77% said that they will repost / share. Thus showing...
the effectiveness of OSM generated feedback in building police - citizen community. We also found that 52.20% citizens said that they will share / retweet the post with negative comments about police and 39.01% said they will comment or reply to such posts. This shows potential of OSM to understand the disagreement expressed by the citizen’s community to strategize better and communicate police opinion.

Citizens responded that they will like to leverage the anonymity offered by OSM to communicate with police. We asked citizens, – “How will you like to communicate information (e.g. complaints and feedbacks) to police using Online Social Media?” We found that 36.26% of citizens will like to post anonymous information on police page, whereas, 29.67% will like to reveal minimal personal information e.g. email id. Only 2.75% might create a fake account. This shows that anonymity offered by OSM can help in providing more information to police from citizens. We contemplate that anonymity offered increased the chances of citizens interacting with police as they would now share their thoughts without being fearful that police could harass them or people against whom they are complaining can identify and attack them [26].

**Challenges to community engagement via OSM:** We identified following challenges for the adoption of OSM –acknowledgment from police,lack of policies, and lack of trust on information available. Survey shows that absence acknowledgement can be a challenge for successful use of OSM. We found that 31.87% said that police should take less than an hour to acknowledge that they had seen the post/message (See Figure 5). With crunch of police personnel , this can slightly overload the police but police departments will need to setup a concrete acknowledgement process for community sustain over a long period.

Lack of policies is a concern for both police and citizens. We asked both citizens and police that how much would they agree that Police should make an Online social media usage policy (rules and regulation) for using and benefitting from Online Social Media effectively. Almost 94% police strongly agreed or agreed with this statement.
and 75% citizens strongly agreed or agreed that policy is needed. Police seemed to be significantly more concerned than citizens. We found this difference to be statistical significant (Wilcoxon rank-sum test, \( z=-7.54, p<0.001 \)) between citizens (\( M=2.03, SD=0.84, N=204 \)) and police (\( M=1.79, SD=0.58, N=399 \)).

Few participants trusted the information that was available on OSM. We asked both citizens and police to mark on a 5-point likert scale, *how much will they agree with the statement that the information obtained via OSM is trustworthy*. In comparison to 49.63% police personnel (\( M=2.4, SD=0.84, N=391 \)), only 17.03% (\( M=3.15, SD=0.9, N=204 \)) citizen agreed with statement (Wilcoxon rank-sum test, \( z=-1.19, p>0.05 \)).

### 5.3 Preferred OSM platform:

We asked police officers which OSM they will use for day to day activities. Similar to interviews, our survey results showed that Facebook and WhatsApp were the preferred networks; 72.17% officers preferred Facebook and almost 60% preferred WhatsApp. We asked citizens which OSM they will like to use to communicate with police. Almost 80% citizens preferred to use Facebook, followed by WhatsApp (44.54%) whereas 42.02% citizens prefer Twitter in comparison to 15.80% police personnel, see Figure 6. We found statistically significant difference between police personnel and citizens choice of OSM (\( \chi^2 \) test, p-value < 0.001). However, preferred platform for both was the same.
Design Implication and Conclusion: In this work, we provide insights for HCI researchers and technologists building social media technologies for policing (See Figure 7). Our research is necessary to formulate appropriate communication strategies and collaboration methods.

We found that legitimacy of information is concern for residents, and they feel it is challenging to verify information posted on OSN. The implication of this on technology suggests that verification and validation applications should be an essential part of technology design.

We find that residents may not trust community-policing technology that does not keep their submission anonymous. However, anonymous posts involve legitimacy issues that make it difficult for police to take actions. We believe that security and the HCI community should design mechanisms that provide anonymity and also keep minimal checks to authenticate information, if needed.

Our results show that residents post defamatory content inhibiting meaningful information exchange. To develop accountability among residents, HCI researchers can design appropriate nudges [32] that educate residents about the legal and social implications of abusive content on OSN.

6 Acknowledgement

We would like to thank TCS research for funding the project. Also, we would like to thank all the members of Cybersecurity Education and Research Centre and Precog who
have given us continued support throughout the project; special thanks to Siddhartha Asthana.

References