Online Social Networks and Police in India—Understanding the Perceptions, Behavior, Challenges

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Abstract Safety is a concern for most urban communities; police departments bear the majority of responsibility to maintain law and order and prevent crime. Police agencies across the globe are increasingly using Online Social Network (OSN) (such as Facebook and Twitter) to acquire intelligence and connect with citizens. Developing nations like India are however, still exploring OSN for policing. We interviewed 20 IPS officers and 21 citizens to understand perceptions, and explored challenges experienced while using OSN for policing. Interview analysis, highlights how citizens and police think about information shared on OSN, handling offensive comments, and acknowledgment overload, as they pursue social and safety goals. We found that success of OSN for policing demands effective communication between the stakeholders (citizens and police). Our study shows that OSN offers community-policing opportunities, enabling police to identify crime with the help of citizens. It can reduce the communication gap and improve coordination between police and citizens. We also discuss design opportunities for tools to support social interactions between stakeholders.

Introduction

Police departments across the globe are increasingly using Online Social Networks (OSNs) to connect with citizens and share law and order[1] related information. For instance, in 2011 riots, UK Police used Twitter to provide localized

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[1]In this paper, we use 'law and order' synonymous with social issues like theft, crime, traffic.

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information, dispel rumors, reassure citizens and to find looters. After the riots, looking at the impact of OSN (Twitter) on policing, the UK government emphasized the need for each police force to develop an OSN communications plan (Home Affairs Committee 2011). Thousands of citizens in developed countries post content and follow police departments such as Boston police and UK police. Citizens provide useful content to police, e.g., situational information, participate in online beat programs[2] needs in different geographical area. and identify—victims, accused, missing people, lost or stolen vehicles (GMP police).

OSNs have demonstrated massive potential to reform policing; however, it introduces various challenges (Davis et al. 2014). Firm legal restrictions on public disclosures and police impression as "coercive arm of the state," make it difficult to communicate with citizens (Denef et al. 2013). Further, past events show that the police misunderstood the citizens' expectation resulting in reputation loss of the department (Los Angeles News 2014). OSN attributes like openness, volume, and velocity at which information spreads also introduce unique challenges for the police. For example, during Vancouver riots (2010), police had no procedure in place to collect citizens' tweets with possible suspect clues (mentioning @VancouverPD) (The COPS Office and the Police Executive Research Forum 2013).

Research shows benefits, effectiveness, and challenges of using OSN by police in developed world (Cobb et al. 2014; Palen and Vieweg 2008; Semaan and Mark 2012). However, need for OSN mediated communication, collaboration, and connectedness between citizens and police in developing nations is largely unexplored. With the increased penetration of OSN in developing countries like India, police are exploring the effectiveness of OSN as a communication channel to maintain law and order (Nayak 2014). Unlike the developed world, police organizations in India lack adequate police personnel. According to the United Nation guideline, 270–280 police personnel are recommended per 100,000 citizens (Express News Service 2013). The policing department in India has only 130 personnel per 100,000 citizens and there is only one IPS (Indian Police Services) officer for every 359,953 citizens Ministry of Home Affairs (2010). In contrast, the US has 233 police officers per 100,000 people (Wu et al. 2012). This lack adequate police personnel results in many under-policed areas in India. Police have felt the need to obtain community collaboration to accomplish its increasingly vast duties and is exploring use of technology like OSN to reach community (Express News Service 2013). However, police personnel have limited exposure to technology (The Economics Times 2014). These limitations (inadequate number of police personnel and technology exposure) make it difficult to adopt findings of OSN use by police in developed world to facilitate policing needs in developing countries like India.

To address these gaps, we study (largely unexplored) needs, challenges, and preparedness of police and citizens for using OSN in a developing nation like India. In this work, we adopt multi-stakeholder approach to examine the OSN use for community policing in India. Our approach includes interviews of 21 citizens and 20 IPS officers who lead and command various police and intelligence organizations in India. Our

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[2]In Police Beat programs, individual police officer is held responsible for community's policing.

work provides an insight about how OSN can help Indian police to build a community and communicate with citizens to achieve community-policing goals. This knowledge can help improve policing services and facilitate community-policing efforts.

Research Objective

In this work we analyze, *whether OSN based technology can be adopted to support communication and collaboration for making safer society in developing countries like India.* To analyze our research objective, we study the following supporting aspects: Why police and citizens can use OSN for improving policing and preventing crime? Which are the different kinds of OSN platforms police is exploring to use? What is the target audience that the police want to reach through OSN? We also analyze the challenges police and citizens think they might face while using OSN for communication and collaboration. The work particularly aims to analyze the role of OSN in supporting collaboration between police and citizens to fight crime, recover from ongoing threats, and maintain law and order.

Our Contributions

Our research builds upon prior knowledge of OSN use by citizens, first responders, and organizations for effective collaboration (Cobb et al. 2014; Shklovski et al. 2008; Stoll et al. 2012; Voida et al. 2012). This research is essential to devise appropriate communication strategies, collaboration methods, and laws and regulations. Our findings are:

- Citizen participation on OSN increases the human resource available with police to identify offenders.
- OSN can help to reduce communication gap and improve coordination between police and citizens.
- Four challenges that can hinder use of OSN for community policing. These include—maintaining meaningful communication, information verification overload, immediate acknowledgement of information shared, and lack of technical expertise and policies to handle information generated on OSN.
- Identify how technological innovation and CSCW research can help support better community policing on OSN.

Related Work

Many studies show how OSN has played an effective role during events involving law and order issues like the Boston bombings, Sichuan earthquake (2008), Haiti earthquake (2009), Oklahoma grassfires (2009), and Chile earthquake (2010).

Gupta and Kumaraguru (2012), Gupta et al. (2013), Mendoza et al. (2010), Qu et al. (2009), Starbird and Palen (2011), Vieweg et al. (2010). These studies demonstrate that OSN provides critical real time information and reduces the misinformation during crisis events. Research shows that citizens use OSN for public coordination during a crisis situations; researchers have categorized public response and shown different communities which developed during crises on OSN (Gupta et al. 2012; Hughes et al. 2008). Research also show that police organizations need effective communication strategy to provide timely information to citizens (Chermak and Weiss 2005; Denef et al. 2013; Heverin and Zach 2010). These studies provide insights on different strategies and activities that police perform on OSN. Recent studies show that OSN is a plausible resource for police forces to reach citizens (Denef et al. 2011). Police in developed nations have realized the effectiveness of OSN in various activities such as investigation, crime identification, intelligence development, and community policing (Denef et al. 2011; IACP 2013; Lexis Nexis Risk Solutions 2012). Few studies explore technology for community interaction and collaboration to prevent crime (Heverin and Zach 2010; Lewis and Lewis 2012).

Benefits of OSN are also accompanied by various challenges like interactivity and pace of information diffusion (Denef et al. 2011). Police departments in developed countries have made reasonable efforts and progress to adopt OSN. Developing nations like India are also influenced by OSN and police (in these regions) are still evolving skills to use OSN for policing (Plane 2013). Few studies in India show that OSN was used to spread misinformation and public agitation during crisis events such as Mumbai terror attacks (2011), Muzzafarnagar riots and Assam disturbance (2012) (Gupta and Kumaraguru 2011; Kumaraguru 2013). These studies report that in these events, panic was spread through fake images, messages, and videos on OSN.

Surveys have shown that OSN 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 technical skill of the staff (IACP 2013; Lexis Nexis Risk Solutions 2012). Another challenge was easy accessibility of OSN to malicious people who can modify or spread rumors, making sharing information a complex task (Denef et al. 2013). These studies provide little insight about—rationale and expectations of police behind these actions and acceptance of these actions by citizens.

To best of our knowledge, it is the first study that examines police and citizens' behavior and expectation regarding OSN use for community policing in India. HCI and CSCW research can improve the communication and collaboration between the two stakeholders (police and citizens) for better policing. For this, insight into the technological interactions between these stakeholders is required. Our research expands on the existing literature of OSN for law and order situation and provides a focused study addressing these specified research gaps. We believe that the insights from our study will provide opportunities to develop better communication strategy for police and citizens.

Background

To understand OSN role in collaboration and communication to fight crime, we discuss interaction strategies of police and community policing approach.

Community Policing Approach

Community policing aims to achieve following: (a) offering decentralized decision-making that empowers field officers to identify crime, (b) prioritizing the problem with the help of local citizens, and (c) introducing transparency in the policing. To achieve these objectives two prime components are recognized—community partnership paradigm and problem-solving approach (Community Policing Consortium 1994). We discuss each of these components below.

Community partnership involves maintaining orderliness and safe neighborhoods with the help of citizens. For this partnership, Indian police introduced provisions such as neighborhood watch committee; join beat constables to perform night beats, and arrange social and cultural get-togethers to understand neighborhoods. These activities of community partnership help develop trust between the police and the community. Police need to develop community trust before involving citizens in decisions-making process. With increased trust, police are able to get valuable information available with the citizens about their neighborhoods. Therefore, community partnership involves developing relationships that increase "bond of trust" by maintaining community contact and frequent communication with citizens (Community Policing Consortium 1994).

Problem solving approach involves four aspects: Information exchange, problem identification, problem solving, and Trust. It involves identifying common concerns for citizens and the police. The prioritization happens with help of citizens, e.g., a police team might think that burglary is the biggest problem in their locality, however, community might consider women assault and harassment as a bigger concern. Once the problems are prioritized, police work at providing solutions to the issues raised by citizens. Problem-solving approach considers those solutions as best that can satisfy community members to improve safety, reduce anxiety, and strengthen the ties between police and citizens (Community Policing Consortium 1994).

The provisions so far adopted for community policing are mostly non-technology based. Realizing the potential of OSN and to involve citizens in policing activities, Indian police have made its presence on various OSNs such as Twitter and Facebook. Table 1 describes Twitter followers and Facebook likes of the popular Indian police pages. In this work, we use the knowledge of community policing components and analyze role of OSN to facilitate policing. We also identify the design challenges that need to be addressed to increase OSN role in community partnership and problem solving. We found that for almost all the police departments, number of followers on Twitter is less in comparison to Facebook likes. Given that

Table 1 Twitter followers and Facebook (FB) likes on police pages

Police departments	Likes	Followers	Post	Joined
Bangalore city[b]	105,463	12,100	Yes	2011
Bangalore traffic[b]	249,968	8045	Yes	2012
Chennai[a]	50,979	1108	Yes	2013
Delhi traffic[a]	202,858	2,59,000	Yes	2011
UP police PR[a]	8304	4585	Yes	2013

[a]Shows both FB and Twitter profiles were not verified
[b]Shows Twitter page was verified
"Post" shows if others were allowed to post on FB
"Joined" shows year in which the page came in existence

the number of likes is more on Facebook than followers on Twitter (for most of the departments), wherever appropriate, we provide examples from Facebook.

Methodology

In this research, we conducted a multi-stakeholder study consisting of 41 semi structured, in-depth interviews. We recruited all police officers through word-of-mouth and mailing lists dedicated for IPS officers; IPS is one among the three All India Service (Ministry of Home Affairs 2010). We completed 20 individual interviews with IPS officers, each of about an hour. In our study, 95 % participants were male and 5 % were female; 20.00 % were in the age group 25–34 years, 10.00 % were 35–44 years, 55 % were 45–55 years and 15 % were 55–65+ years. They provided services in different states and three officers served special branches. They were of the rank ADG (Additional Director General), DGP (Director General of Police), and above. Interview questions comprised of topics such as the need for police to use OSN, how OSN has been helpful so far to police, understand OSN usage policies followed by departments, and challenges in adoption of OSN. Among eight officers who used OSN for official purposes, only two officers had used OSN for more than two years. Rests were planning to use OSN for official purposes.

Next, we interviewed 21 citizens to understand their perspective on the presence of police on OSN. Citizen participants' demography was diverse (e.g. age group, education, and occupation). Interview questionnaire for citizens comprised of different topics such as, ways in which citizens will like police to help through OSN, and preferred OSN for communication with police. Most citizen participants reported using OSN like Facebook for the last three to five years, whereas police officers reported recent use (almost an year) for policing activities. Ten citizens were aware of Facebook police pages; among these, six had heard or visited police pages on OSN and three mentioned that they had visited these pages to communicate with police. Citizens in the interviews consisted of 57.14 % male and 42.86 % female; 23.81 % were between the ages of 18–24 years, 42.86 %

were 25–34 years, 14.29 % were 35–44 years, 9.52 % were 45–54 years, and 9.52 % were 55–65+ years. Participants were from a broad range of educational background: teaching/research (25.53 %), fashion designing (11.76 %), MBA (5.88 %), computer/IT (29.41 %), and other fields (29.42 %).

These interviews (both citizens and police) were conducted by one of the authors and she met the interviewee one on one. Few interviews were conducted through telephone. We chose to conduct interviews in English as it is the common business language used in the country. All interviews were recorded and transcribed for analysis. We used randomly generated numbers to identify the subjects in our notes so as to maintain subjects' privacy. Participants were shown consent information, after they agreed to participate in our study. Recruitment approach followed in this work has also been used in other CSCW studies (Semaan and Mark 2012).

Qualitative Analysis: We applied limited grounded theory analysis on interview responses. An analyst iteratively assigned codes: open codes, axial codes and dimensional codes. Grounded theory method allows coding by a single analyst because of the intense labor involved in the coding process (Charmaz 2006). Initially, 25 codes were developed, which were condensed to four categories— why OSN, preferred OSN, target audience, and limitation of OSN for policing. Over successive iterations of coding, 3 categories—why OSN, preferred OSN and limitation of OSN categories became independent dimensions with their own subcategories. Participants gave mixed and nuanced responses for target audience; therefore we combined tentative subcategories as one category.

During the process, we developed various memos based on the incidences and cases shared by the participants and relationships observed between the categories. We used conceptual memos to note the meaning of codes and record when events happened, and respective consequences. Authors are aware that the core aspect of grounded theory method is an emerging theory from comparisons of codes and successive iterations. However, in this paper authors do not report a full theory analysis and use these categories in combination with quantitative results to understand the policing scenario on OSN. This limited use of grounded theory for interpreting data is an established research approach (Charmaz 2006; Muller et al. 2014; Muller and Kogan 2012).

Results

In this section, we report participants' perception, evaluate the current status of OSN for policing and the associated challenges.

Why Are OSN Needed?

Three themes emerge from our analysis of the interviews: (1) OSN can support policing by increasing citizen participation to identify crime, (2) OSN can reduce

the communication gap, and (3) OSN can improve co-ordination between the police and citizens. We now discuss these themes and support these inferences through evidences from content analysis of Facebook pages. We refer interviewed IPS officers as P1…P20, and citizens as C1…C21. To analyze the situation on actual position on OSN, we provide anecdotal evidences from Facebook pages, which substantiate the perceptions of IPS officers and citizens on use of OSN.

Increase Citizen Participation to Identify Crime

Officers express that OSN can help increase the personnel (citizen volunteers) available for police to identify offenders. According to officers, using OSN, citizens can easily report defaulters and lawbreakers. P7 says, "OSN can be used to create a community of people who will be using it (OSN) [to identify crime]." Another officer states that before the introduction of OSN, only traffic police on roads were responsible for catching traffic violators, but now anybody can use OSN pages to post pictures of traffic violators. P17 says, "Delhi Traffic Police page involves public [citizens] in finding traffic violators, on the basis of which challans [fine] are issued. So our limited resources are increased, and we can catch many more people by seeking help of public [than before]." Officers believe that using OSN, citizens can provide real time content to inform about crime. For example, P9 states, "Young people are using OSN on the mobile devices. They can upload real time content [from the crime location]."

Consistent with police officers, citizens also agree that OSN pages can help report issues related to traffic and crime. These issues include traffic congestion, accidents, beggars, corruption, and other issues with public transport. Most citizens remark that they will like to use OSN pages to report traffic issues like unruly behavior of taxi or autorickshaw drivers. For example, C1 says, "I use public transport like autorickshaw; they [auto drivers] either overcharge or harass passengers by refusing to go. I will like to report these cases." According to citizens, OSN can also provide opportunities to engage with police to report crime such as theft, neighborhood issues, and crime against women. C13 states, "if I see a girl in a vulnerable situation I might give this information [on the Facebook page of police], and they [Police] can take instant action." C12 says that she can instantly geo-tag the crime location in the Facebook post to help officers receive quick information about exact location of the crime.

Facebook content analysis shows that citizens use these pages to report activities such as the use of tinted dark glasses in cars, crimes against women, and neighborhood issues like drunk men on streets. For example, A citizen complains about drunk men and posts a video as an evidence, "I am posting a video as well of people drinking openly at XXX wines, sec 1X-1Z road. I had posted pics from the same location on 13th Aug as well" (see Fig. 1). These observations show that citizen participation on OSN can increase the personnel available for identifying crime and law offenders.

Fig. 1 Citizen posted an image on Facebook to report illegal use of streets for alcohol consumption

Reduce the Communication Gap

We find that OSN can reduce the communication gap between police and citizens in three ways: (1) OSN can help understand the public opinion about various law and order issues, (2) OSN can help get feedback from citizens, and (3) OSN allows citizens to overcome social pressures to approach the police.

Understand citizen opinion: Officers mention that OSN can provide effective understanding of public sentiments and opinion. P3 states, "Whenever we think of OSN, we think it in terms of what are the aspirations of the public [citizens], what they want from us, what are their grievances and how we can address them." Officers report OSN to be better than existing media (such as television) to gauge public opinions. P3 states, "OSN is more representative; police delivery [of services] can be more up to mark. On TV we are not sure of how many people are interviewed, they show only 2–3 people. This number cannot be used to show mass opinion." According to officers, understanding the opinion of citizens is important for early crime detection, crime prevention, and for reducing communication gap between police and citizens. Similar to police officers, few citizens also agree that police can know about public opinion using OSN. C6 states, "Your status speaks everything. They [Police] can know what is going in mind of citizens and take action accordingly."

Feedback from citizens: Officers believe that OSN based feedback (both positive an negative) from citizens can bridge the gap between police and public. We asked officers, what will be their reaction to the message such as Scenario A, I will like to thank the police to improve law and order. P9 says, "make it reach as many people as possible and post it. Helps to show a positive image of your organization. Good feeling among the community and for people." P12 says, "further propagate such message; these tweets are hardly to be seen. Definitely they will boost up the moral." Officers considered it important to reply to feedback posts to keep the connection with citizens and show that citizens' views are respected. P8 says, "convey thanks for posting; it should be taken cognizance of. The other person should feel that somebody is taking note of his thoughts." Officers said that they will also appreciate negative feedback and take appropriate actions. We showed officers a post, Scenario B, in which a citizen had complained about unavailability of police on a highway where a girl was being beaten. P1 says, "we will

check if actually it is happening and take action; subsequently will post about the action." Officers believed that OSN can help explain the reasons for such lapse so that people can understand the situation better. Adding, further officers mentioned that in the absence of OSN, police depend upon exiting media such as television and newspaper to explain their decisions. On these media, the police views are presented as understood by the journalists. However, with OSN police officers can directly communicate with citizens and express their views (without influence of journalists). P4 says, I would like to use OSN to give official version of any information. Because they [citizens] always hear the story from what media [television or newspaper] has to say which always might not be correct. [Using OSN] They [citizens] can hear what we have to say directly from us. Police version is the correct version and people should start trusting it [police version] instead of media [television or newspaper].

We showed the above-discussed scenarios—A and B to citizens. Few citizens said that they will like to spread/reply to positive messages. C1 says, "There are certain situations when police really give their best. [I will share this post to] Encourage police and let others know that police is doing something." More citizens mention that they will share or like a post in Scenario B than Scenario A, so that police are more informed about the issue. Citizens believe that like or share utility might let police understand the gravity of the situation. A citizen mentions that if many people complain about the same issue police might take some action.

In Facebook posts, we find that citizens appreciate police for the good work and share what troubles them. For example, a citizen complains about an undisciplined drunk police constable (see Fig. 2). Such posts can help police understand citizens' concern, which play a significant role in reducing communication gap. Understanding the citizen's need for anonymity, police say in a post that citizens need not reveal their identity if they want to help solve violent crimes. Thus, content analysis of Facebook pages shows that OSN can reduce the communication gap between citizens and police by encouraging frequent exchange of information and feedback.

Provides anonymity: The third method which helps reduce the communication gap is OSN's ability to facilitate anonymous communication between police and citizens. Many citizens mention that they will prefer an anonymous platform to communicate with police. C7 says that he will like to make an anonymous

Fig. 2 Post showing police acknowledging citizens' concern regarding undisciplined police constable. This post received 102 likes

complaint on OSN against local Member of Legislative Assembly (MLA, politician), and illegal activities of a local shopkeeper, which otherwise is not possible as these influential people can harm him. Citizens report that they are fearful and concerned about their security, therefore, use fake-profiles to share information with police. For example, C16 states, "I created a fake profile to post pictures of traffic offenders, so that law offenders are punished, but they do not get to know that I complain about them." Some officers also acknowledge that citizens may not feel comfortable revealing their identity on Facebook, and may use pseudonyms similar to undercover informers. These observations show that OSN helps overcome social fears and pressures while communicating with police.

Improve Coordination

In this section, we show that OSN can improve coordination between police and citizens by keeping citizens informed and delivering targeted messages.

Keep citizens informed: Officers mention that the police can use OSN to keep citizens informed about various arrangements. For example, P15 states, "OSN help in disseminating information and forewarn [citizens] about areas that might see a conflict." Further, P2 states, "OSN can help inform citizens about jewellery snatching cases, time it can happen, and precautions to be taken." Officers show interest in posting wide variety of advisories (an official announcement or warning) through OSN such as crime alerts, safety tips for women, children and senior citizens, places to avoid during major events and natural calamities like cyclone or floods. An officer states, "A cricket match and a popular festival happened on the same day; we were expecting a large gathering for both the events. These crowds were required to cross each other's route to reach their destinations. To avoid traffic, we issued instructions through public post on OSN; this proved helpful to manage the crowds and avoid traffic on roads." Citizens also view OSN as a means to obtain timely alerts from police. C7 says, "Suppose there is a threat in Delhi, and they [Police] give me alerts on it [OSN] then I would have liked to follow it [police Facebook page]." Such alerts can keep citizens informed and improve coordination.

Targeted communication: Officers acknowledge the need to communicate appropriate advisories to appropriate audiences for improving coordination with them. These advisories are communication-intensive, highly social, cultural, and influence social networks in the real world. Officers in different regions have different needs and priorities for issuing these advisories. For instance, P1 states that OSN can be used to spread awareness regarding social evil practices of witch-hunting in northeast India. 3 Officers from Haryana (a state in North India) mention that they will like to create awareness about women, children and senior citizen safety as one agenda. Few citizens also mention that they will like or share an advisory only when it is relevant to their network. This suggests that OSN can help in spreading targeted messages to improve coordination.

Fig. 3 Image posted by
Delhi Traffic Police on
Facebook informing citizens
about traffic diversion
for Independence day
celebrations

Consistent with the interview analysis, we find that the police use Facebook
pages to keep citizens informed about policing arrangements. A police post
informs citizens which roads will be closed for general traffic from 5.00 AM to
9.00 AM (see Fig. 3). Another post informs citizens about criminals and states
"Nataraja@Mallu, a notorious rowdy involved in assault, extortion, kidnapping &
attempt to murder booked under Goonda Act today." To target specific audiences,
we find that Delhi police maintains a dedicated page for North Eastern Indian citi-
zens who were recently victimized in the city.

Which OSN Police Prefer to Reach the Citizens?

We asked officers, which OSN do you use for your day-to-day activity to main-
tain law and order? We find that police organizations are using or planning to
use a variety of OSN platforms. Among these, Facebook and WhatsApp are the
most preferred networks. Some platforms are used to communicate with citi-
zens (Facebook and Twitter) and some are used only within the organization
(WhatsApp and YouTube). Sixteen officers prefer Facebook over other OSN for
activities involving citizen participation; among these sixteen, 6 officers use only
Facebook. P4 said: "Facebook is more interesting. Personal viewpoint can be
expressed and it is more interactive. People [citizens] prefer to give their inputs
through Facebook." Some officers advocate the need of dedicated Facebook pages
for policing tasks. P19 says, "Depending upon the need of the department they can
have it [a Facebook page] for specific purposes like woman's extortion cell, child
abuse cell, and extortion cell." Few officers mention using Twitter; these offic-
ers believe that Twitter requires less time as it is used by few people. P15 says,
"Actually it is the matter of how much time you can devote. Facebook gets too big

and involves many more people [whereas on] Twitter you make a small comment and it is done."

For personal and within organization use, officers use mobile-based applications like WhatsApp and BlackBerry Messenger. Many officers feel that WhatsApp is better than Facebook to get instant information about the current situation on the ground. P13 says: "During a gathering or law and order situation, the usual question is how many people [are there]. Then they [officers in control rooms] start guessing, if officers on duty have a phone they can click the picture and upload it, so that in the control room, we have an idea." Officers further add that WhatsApp showed when the person was last seen online and therefore cannot deny receiving the message. P12 mentions, "Nobody can deny that he or she have received a message." While comparing Facebook with WhatsApp, P18 says, "With WhatsApp, we can send an audio file as well. We can transfer photos, images instantly with WhatsApp. I feel Facebook is terrible in this case. Suppose you want to upload an image to Facebook, it will take a lot of time." Officers feel that policing requires instant response, as time plays a crucial role and can make or break things.

Who Is the Target Audience?

We asked officers, who are the target audience you want to reach through OSN. We find that there was no clear understanding of target audience on OSN among the officers. P6 says, "every citizen is our target audience, but audience is limited to account holders [on OSN]." Similarly P4 remarks, "persons who are using it [OSN], affluent classes, students younger generation who can afford to use the Internet." Few officers who feel that younger population and students are common audience on OSN believe that OSN can help reach and connect with youth better. P3 says, "Youth is sometimes available only on OSN; what they have to say is sometimes not available on traditional media/sources of information. They have very strong ideas which are otherwise missed out."

Few officers say that currently OSN was restricted to urban areas and did not have good reach in rural areas. P9 says, "Urban sector, yes we can find some information. Rural areas, it is not of priority [to reach through OSN]." We find similar views among few officers regarding the use of mobile phone applications like WhatsApp; P13 believes that there are few WhatsApp users in India. The limited reach restricts efforts to use OSN for policing by some agencies in urban areas only; but in the past, we find that OSN effect percolated to rural areas in crises situations like riots in Muzzafarnagar and Assam Hindustan Times (2013); Press Trust of India (2013). This shows that officers have limited understanding of OSN reach and audience it impacts. Officers do not mention any distinction in the population on different platforms and believe that OSN can be used to connect with anybody.

OSN Challenges and Overheads

We now discuss the following four challenges that can hinder community-policing efforts using OSN: maintain meaningful communication, verification overhead, acknowledgment overhead, and lack of technical capabilities.

Maintain Meaningful Communication

Participants acknowledge the need for maintaining information exchange through
OSN that is meaningful to improve policing decisions and arrangements (here after referred as meaningful information). We identify two factors that can inhibit this meaningful information exchange on OSN: (1) unclear and generic information from police and (2) violent and abusive content from citizens.

Citizens remark that advisories during riots help take appropriate decisions but think that some police posts are too ambiguous and may not help take appropriate decisions. For instance, citizens find that police advisory released on Facebook asking citizens not to trust any rumors posted on OSN during Muzzafarnagar riots (See Fig. 4) was too generic to be enforced. For example, C4 states, "This information is useless. If my friend is tweeting or sharing (Fig. 4) how will I know that it is not fake. The post says not trust any tweet, why should I trust this post." However, most police officers feel that it is useful to share such information.

Officers fear that on OSN, citizens may use inappropriate expressions and informal language to communicate their thoughts. P10 states, "Expectation of people how police should use OSN is not based on the clear understanding of law enforcement agencies. They think that the way they use informal style language on Facebook accounts, law enforcement will also do the same. That is not possible." An officer mentions that Twitter profile and Facebook wall have the potential to create havoc. Officers also express inability to remove or control the spread of abusive content from the official pages. They believe that removing inappropriate comments may give the impression that the police are censoring the page and may obstruct community-policing initiatives. Similar to interview analysis, online posts on Facebook pages show that citizens post abusive content. For example, in reply

UP Police PR shared Pro TO Dgp UP's status.
September 8

कृपया FACEBOOK, TWITTER, YOU TUBE, WHATSAPP पर
प्रचारित किसी भी प्रकार की अफवाह, वीडियो क्लीपिंग पर विश्वास न करें।
उपद्रवियों पर सख्ती से काबू पाया जा रहा है।

Fig. 4 Advisory shown to participants posted by UP police on Facebook "Please, do not trust any rumor, video clipping shown on Facebook, Twitter, YouTube, WhatsApp. Nuisance creators are being controlled sternly." Post received 26 likes

to a police post informing citizens about arrest of a criminal, a citizen posts comments like "Shoot all bloody rapists," "bastard," and "That bastard private parts should be cut so it sets an example for others too."

Verification Overhead

Officers believe that information obtained from OSN is a starting point, and it is essential to verify the information. P17 states, "Any information is just information as long as it is there. After that it has to be verified, correlated with other information, for this piece of information to go to the category of intelligence." Officers also mention about various techniques they may use to verify the information available on OSN. One approach is to look at the number of responses (multiple posts) posted related to an issue. P3 states, "More are the number of responses that we check, more we are close to the truth." Another approach that officers mention for virtual verification is to check the source of the information. Citizens also agree that information obtained from OSN is not completely trustworthy and requires verification. However, most citizens say that if information comes from police pages, it will be trustworthy and will need no verification. Citizens (similar to police) rely upon the source of the information to judge its reliability. C12 states, "I do not trust the information, I verify the source of it." Analysis of behavioral data shows that police may ask citizens for additional information for verification. For example, one of the police pages posted, "Thanks, Kindly re-post the pictures with clearly visible R/C [Vehicle Registration] No., time and place also so that proper action can be taken against the police personnel." In some cases, police request citizens to contact an officer who can verify the details and take action. For example, "Dear [name], Please visit at [XXX] Police Station and lodge a complaint with the details, and they will take necessary action in this regard. Thank you;" shows police need to verify information shared on OSN.

Acknowledgement Overload

OSN users often expect a quick response when they post a complaint or a request on OSN (Kelly 2014). We analyze citizens' view on how long police can take to respond to a citizen's request. Citizens' expectation varied from few minutes to a week. C5 states, "if police has to use OSN, then there should be a team who should be checking it every second." For some citizens, type of complaint and volume of complaints received on OSN influence frequency of acknowledgement. C14 states, "That depends upon the issue, traffic problems can be answered in 1 or 2 days. Children/people who need immediate help like accident cases should get an immediate response." Very few citizens state that the police should send an immediate acknowledgement that they have received the complaint. According to police officers, responses cannot be provided immediately. Few officers say that they can respond once in a day and for some officers it depends on the need. This

expectation difference between police and citizens can inhibit the active use of OSN for policing. Analysis of Facebook pages shows that the police do acknowledge citizens' post, for example in a post police states, "Dear [name], Your post has been conveyed to High Ground Police Station (080-229XX587/XX83), They will assist you in this regard. Thank You."

Lack of Technical Teams and Policies

Officers think that lack of manpower who are capable of handling OSN pages of police inhibits social media adoption for community policing. They also mention about the need for guidelines and policies, which can lead to uniformity and clarity in decisions while using OSN.

Most officers believe that police departments require trained people who can help leverage the benefits of OSN. P9 states, "Team of better people as of now, it is a resource constraint for us who can help us use it better." Officers think that the OSN team should be acquainted with police decisions and be very specific about content they post on OSN. P3, while discussing characteristics of the person handling OSN page states, "Person, who can be very specific about what he speaks; for now, he will share very limited type of information."

Officers mention the need for policies that can help understand the pros and cons of using OSN. For example, P4 states, "It [OSN for policing] is still in an experimental phase but to leverage its benefits, policy has to be built, keeping in mind—OSN usage, pros, and cons. Like Facebook's servers are outside India, so how information [confidential] can be saved [stored] on them." Officers mention a need for guidelines on content to be posted. They believe guidelines on content are important to generate information that can keep citizen communities interested during lean periods (time when there is no crisis to deal with). Few officers think that policy can help define boundaries and extent to which OSN should be used by police. P5 states, "Centralized guidelines should be there on how to use Facebook, Twitter and YouTube otherwise everybody will start using it in his or her ways. Thus, the current absence of OSN policies and guidelines limit the use of OSN for policing.

Discussion

In this work, we explore how OSN can facilitate community policing in India. Consistent with the previous research in the developed world, we find that OSN can help involve citizens in policing through various ways: increasing citizen participation in neighborhood watch, reducing communication gap and improving coordination between "grassroots" members of community and police department (Heverin and Zach 2010). Researchers in the CSCW field are uniquely positioned to develop tools necessary to support police-citizen relationship on OSN. Current

CSCW research investigates OSN use by first responders and citizens primarily during crisis situations, which are event-driven and have specific goals to be achieved in a short term (Denef et al. 2013). It is unclear how this knowledge can be used for day-to-day communication in policing activities that are diverse and are not time bound. We find that effective policing through OSN requires identifying the needs, planning activities, creating useful content to be shared, and constantly communicating with citizens. We now discuss OSN role to facilitate frequent contact and ease information exchange as required in different components of community policing in day-to-day policing.

OSN Role in Community Partnership Paradigm: Lack of communication is frequently cited as a major problem resulting in lack of trust in services offered by police (Lewis and Salem 1981). Our study shows that OSN provides opportunities for police to keep citizens informed about policing arrangements and decisions. However, officers in our study think that they need to understand the content and characteristics of interaction that can happen on OSN during "lean periods" (when no major event is happening of law and order interest). This can help keep the community involved and get persistent visibility to police. We think that persistent presence on OSN can also help police to get quick visibility during high impact events like blasts where communication need has been felt the most.

Our study shows that police believe OSN can help reach the desired set of population and can provide opportunity to have a constructive dialogue and exchange feedback among police and citizens. However, police say that constant communication needs to be constantly guided through specialized 24×7 OSN teams, policies, and guidelines. We find that though OSN facilitates quick information exchange between police and residents, designing appropriate nudges that educate about the legal and social implications of abusive content can reduce the misuse of OSN. This can help improve effective communication between the two stakeholders. Defamatory content can be a major block for successful adoption on OSN by police. Most citizens during interviews mention that abusive content should not be used on OSN while expressing disagreement on police actions. We find that, in recent events, defamatory content posted against a politician on Facebook and WhatsApp led to violent protests in Mumbai, India. Police filed a complaint against the accused, but lacked concrete means to educate citizens about implications (legal and social) of such content.

Citizens often fear police and feel that revealing facts about crime may expose them to criminals; these apprehensions hinder police—community association (Community Policing Consortium 1994). Prior work in developed world suggests that citizens may not trust community-policing technology that does not keep their submission anonymous (Lewis and Lewis 2012). Similarly, in our study, we found that citizens prefer to use OSN as it provides anonymity that can help citizens reach police without social pressures and fear; thus, OSN facilitates community contact and partnership. OSN provides a platform where citizens can hold police accountable for taking action against crime but not expose themselves to criminals or other social pressures. However, anonymous posts involve legitimacy issues that make it difficult for police to take actions. We believe that technological solutions

require amalgamation of security and CSCW domain such that the proposed technology can provide anonymity to citizens, but also keep minimal checks to authenticate information if needed.

OSN for facilitating problem solving: We find that both citizens and police believe that using OSN, citizens can inform the police about vulnerable streets in the city, report geo-tagged posts that can give instant information about the location of the crime to the police. Citizens can also post images and videos of unsafe neighborhoods. This information exchange can facilitate two important aspects of community policing: (a) the problem-identification and (b) prioritization based on citizen's input. Problem-solving approach suggests that best solutions are those that satisfy the community. Police after examining OSN generated content can identify priorities of different communities and use this information to make appropriate judgment to satisfy the safety needs of citizens. This can help make community feel safer and can generate trust in police. Police Officers in our study mention that OSN can help explain reasons for lapse in policing arrangements directly to citizens without involving journalists (as needed in other mediums like television and newspapers). This can help citizens understand the situation at hand and also encourage information exchange to address the lapse.

We find that for success of OSN, police will need to acknowledge the information exchanged through OSN; our work shows this can be an overhead for the police. Therefore, the police departments need a technology that can imbibe an effective acknowledgment system on OSN platforms. We find that citizens' preference for response time on the post varied depending upon the case. An analysis of communication patterns can reveal expectation of citizens regarding response time to complain. This knowledge can be used to design a semi–automated acknowledgement system. Social tools can also help classify the content posted by citizens on OSN in various categories, and police departments can set flags to send an acknowledgement based on the category. This can help reduce the overhead and enable frequent OSN use.

We also find that legitimacy of information exchanged through OSN can impede the information exchange during problem-solving process. Setting up OSN profiles and pages, can get a large number of posts for police to address. Legitimacy of this information is also a concern for police and they feel it is challenging to verify all the information posted on OSN. However, police feel that multiple responses on the topic can be a good indicator that the information is legitimate and verified. Tools and applications can be built to ease this verification and validation. These tools can provide cross-platform verification and get responses from different OSN, resulting in increased pace at which police obtains responses from different platforms on the issue. Alerts can be generated to inform police about the verification being done on the content; this can expedite the police decision.

As we conclude this paper, we believe that this work outlines the requirements (as extracted from our interviews) for a socio-technical solution that can facilitate two important component of community policing—community partnership and problem-solving process. This study creates an understanding about policing

requirements from OSN. This study also provides designers and researchers with insights for designing technology that empowers and encourages police—citizen communities to address social issues. Community policing so far has been addressed using non-technology tools but community oriented platforms like OSN can act as a facilitator and catalyst to policing.

Limitations

This study provides insights on perceptions, behavior and challenges for OSN use in community policing, however, there are some limitations to this work. We only study users from urban and suburban areas where OSN influence is high. It will be interesting to study a broader space. Other communities for e.g. OSN users in rural areas may prefer different technologies like voice based solutions for community policing. The number of male policemen in our study is dominant, however male and female ratio in our study, is representative ratio of the genders in IPS (Joshi 2012). Another potential limitation is of the interview methods that analyze perceptions of the participants and cannot measure the behavior of subjects. We present preliminary evidences of actual behavior using Facebook content but think that behavior can be understood through further analysis in future studies.

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