Social Networks for Police and Residents in India: Exploring Online Communication for Crime Prevention

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ABSTRACT

Safety is a concern for most urban communities; residents interact in multiple ways with the police to address their safety concerns. Positive interactions with police help residents to feel safe. In developing countries, residents have started to use Online Social Networks (OSN) such as Facebook to share concerns and seek solutions. In this study, we investigate whether residents’ post on OSN contain actionable information that police can use to address safety concerns and how residents use OSN to communicate with police. For this, we analyze residents’ posts and comments on the Facebook page of Bangalore City Police, India, over a period of one month. Our results show that residents post information (including location) about various crimes such as neighborhood issues (drunkards, illegal construction), financial frauds, property crime, and thefts. In addition to crime, Facebook page gives information on residents’ satisfaction and police performance. Majority of residents use police Facebook page to appreciate the good work of police. Police response to residents’ post vary from ignore, acknowledge, reply, and follow-up. We find that police respond to most residents’ post and help residents to reach the authority who can help solve the issue. Police adopt a formal communication style to interact with residents. We find that in addition to actionable information, OSN can help understand fear of crime among residents and develop mutual accountability between police and residents.

Keywords
Community safety; Police accountability; Actionable information; Online social networks;

Categories and Subject Descriptors
H.5.3 [Information interfaces and presentation (e.g., HCI)]: Group and Organization Interfaces—Collaborative computing, Computer-supported cooperative work

1. INTRODUCTION

Police officers interact with residents in multiple ways to address the day-to-day safety and crime issues. These interactions include permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Copyrights for components of this work owned by others than ACM must be honored. Abstracting with credit is permitted. To copy otherwise, to republish, to post on servers or to redistribute to lists, requires prior specific permission and/or a fee. Request permissions from Permissions@acm.org.

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responding to residents’ calls, creating awareness and resolving residents’ queries. Police are often considered to be the most representative and perpetual government service. Positive experiences (e.g. addressing the complaints) can help generate feeling of safety among the people; whereas a negative experience (e.g., misconduct by police) leads to sense of insecurity among residents [28]. Negative encounters isolate residents and result in crime going unidentified and unreported. However, resident’s experiences are often not shared with police, considering their image of “coercive arm of the state” [7]. In lack of the information about resident’s experience with police and crime incidences, there is a little opportunity for police to change the crime landscape, explain their actions, and involve residents in crime prevention activities. For police, understanding the community perceptions are helpful to know the effectiveness of safety measures and improve the organization’s plan to address crime [17]. Police explore effective communication strategy to obtain timely information from residents and understand their concerns [6, 7, 10, 18].

OSN such as Twitter and Facebook have become part of community interaction strategies with their increasing popularity [12]. Police departments in developed nations are using OSN to identify crime with the help of residents and understand safety concerns of the residents. Research in developed countries shows that OSN plays a crucial role in community policing for improving public relation and encourages diversity of content (i.e. photos, text, videos) [7, 12, 19]. Most of this experience about how police can use of OSN for trust building and online communication is derived from OSN use during crisis events, such as hurricane and fires. Police in developing countries such as India have also turned to OSN for improving interaction with residents and understanding residents’ concern. However, it is unclear if the knowledge of OSN use in event-driven safety campaigns (that last for specific time period) in developed countries can be helpful for police in developing countries to strategize policing through OSN. Unlike developed world, police organizations in developing countries have a lack of police personnel and limited exposure to technology; these limitations make it difficult to adopt OSN theories from the developed world to developing world. Our study focuses to understand a) what actionable information (i.e. necessary information to deal with the situation at hand) is available on OSN for police and b) how residents use OSN to express fear of being victimized, policing needs, and police performance in developing countries such as India. We study Facebook as it is considerably popular and most used OSN in comparison to other social networks in India [23]. In this study, we analyze 255 posts and 1,600 comments from residents on Facebook page of Bangalore City Police (BCP) in India.

Bangalore City Police was stabilized in 1963 and is responsible for the overall policing in the Bangalore city. Bangalore police
Our work makes following contributions: it develops an understanding of how OSN can be used in urban cities of developing countries like India to build community policing and accountability for policing. Our work focuses on understanding technology like OSN for addressing fear of crime and community policing. Our contributions illustrate that in developing countries, OSN can support policing through community crime prevention theory called Victimization theory [17]. Using the findings of our study, police can evaluate the sense of safety among residents and police performance in urban cities of developing countries.

2. RELATED WORK

OSN contributes to the improved tradition of participation, responsiveness, and openness to different government organizations [22, 32]. It provides a mechanism to develop personal relationships with residents by disseminating information about performance and government agency’s actions followed by inputs from citizens on these actions. Developing personal relationships can increase the trust residents place on the government agencies [16]. Research shows that unlike other organizations, police departments represent the most omnipresent and ubiquitous body of a society. The competing demands of residents lead to greater expectations that government agencies like police must be “leaner” and “do more with less” than other organizations [15].

Research in developed countries shows that OSN extends two inherent benefits for police: a) it can support primary policing roles such as crime investigations and prevention, and b) it can offer a swift, direct platform of communication with the public [11]. Police in developed countries have rigorously used OSN as a direct platform for public communication during critical events such as crisis. Many studies have shown how OSN played a useful role to provide critical real-time information and reduce the spread of misinformation in developed countries [21, 24, 27, 31]. Researchers also found that residents used OSN for general coordination during a crisis, categorized public response, and showed the existence of different communities on OSN during crises [9, 13]. Despite its various advantages, OSN can be intimidating for police organizations as it leaves them off-guard to continuous citizen scrutiny and comments. Also, using OSN information offenders can perform organized crimes and generate support for themselves [11].

Studies (conducted in developed countries) show that police organizations need effective communication strategy to obtain timely information from residents and understand their concerns [6, 10, 18]. Most of the literature that focuses on technological solutions for police, propose systems for individual needs of the police department. These needs include management of law enforcement content and use of video surveillance [5, 30, 16]. These studies ignore residents’ perspective on the technologies for handling crime. Researchers who focused on residents as users proposed solutions for personal safety, wearable devices to reduce fear, and report unsafe areas [4, 26]. Such research efforts exploit the principle of providing information to individuals to manage law and order issues. Few studies explore technology for community interaction and collaboration to prevent crime [11, 18].

In developing countries, most research focus on proposing systems for individual needs of the police department and residents [4]. However, technologies like OSN that can focus on community action to respond to law and order situations are largely unexplored in developing countries. Various community crime prevention theories show importance of collective action to sustain community co-
hesiveness and fight fear of crime. Similar to developed countries, OSN use also influences police organizations in developing nations like India. In developing nations, residents and police are still evolving skills to use OSN as means of communication. There is little known about a) if residents can use of OSN as an e-government service to exchange crime related actionable information with police, b) if police can provide citizens service beyond BCP and replying to residents’ request during regular and routine interactions on OSN or c) if OSN can help police understand crime and fear of crime among residents. Thus, our study aims to answer these research questions.

3. THEORETICAL BACKGROUND

We now discuss the theories that provide a background explaining the characteristics that affect the adoption and use of OSN for policing and crime prevention.

3.1 Victimization Theory

According to Victimization theory, a crime is an event that can happen when an offender finds a victim in an exploitable environment [17]. Removing any one of the three – victim, offender or exploitable environment can deter crime from being executed. Therefore, a victim may analyse risk involved in the environment he/she is part of and accordingly decide. For example, residents often avoid secluded areas as they think it might be unsafe to visit them. In case of a crime, victims may choose to react individually or collectively. The individual reaction can disable residents trust in others, isolate them, and contribute to the disintegration of community. In extreme cases, such individuals might take the law into their hands. However, if residents choose to take collective action to fight crime, this may help to reduce victimizations and increase social cohesion. For example, people might trust individual or authority that promises to restore law and order. Residents and police may conduct community meetings to plan an action on crime and address resident’s concern. The police organizations develop strategies to increase the probability of citizen participation in collective efforts as such intervention strategies can help to prevent victimizations and increase community cohesion [17].

In India, most crime prevention approaches provide potential victim with the information in order to protect them from falling in danger or prevent crime (e.g., police websites to keep citizens informed about crime affected places) rather than increasing community crime prevention. In this paper, we examine BCP Facebook Page (brcitypolice) designed to involve residents to participate in crime prevention. We found that though this page provides residents with information, residents use the Facebook page to facilitate collective action and keep police informed. According to victimization theory, fear of crime is a consequence of experiencing direct (self-victimization) or indirect victimization (getting to know about crime from different sources). We also examine how the knowledge of victimization theory can help police understand the fear of crime among residents and policing needs.

3.2 Modern organization’s communication

Literature suggests that communication is a complex task for the modern organizations. All organizations take different approaches to involve residents for accomplishing the tasks [29]. Similarly, modern police organization need well-equipped communication system to promote the flow of information [15]. This information flow is vital for operational effectiveness so that police have clear and comprehensive picture of what is happening. Communication style (such as being polite and patient) and engagement with the users (being expressive about the situation) influence the success of the organization [29]. We analyze the elements of communication such as communication style and engagement type to understand how police and residents use OSN to communicate, engage, and share information among themselves and how helpful would the interaction through OSN be to improve policing.

4. METHODOLOGY

In this section, we discuss general Bangalore police strategy to interact with community, and follow this with discussion about the data collection, and analysis methodology for our study.

4.1 City Policing in Bangalore

Bangalore is an Information Technology (IT) hub of India and supports people with diverse backgrounds such as different ethnic communities. Recent reports show that the city experienced maximum number of robbery and dacoity cases in the country. It was the second highest city to receive reports for cases of rape, kidnap, and murder [8]. Thus, crime remains a major concern for residents of the city. Since, it is the fourth-largest metropolitan city in India and supports a population of almost ten million [14], police departments need increased support to counter crime. Bangalore city police provide various ways for residents to reach the police individually. These approaches include a telephone helpline to police control rooms, a women’s helpline, Children’s helpline, Elder’s helpline. Formal procedures to file a complaint include residents visiting the police station, mailbox to drop the complaint at all police stations, letter to the concerned ACP / DCP, or Police Control Room or by E-mail. Residents unsatisfied with the police can visit the nearest police station to file a complaint. The City Police jurisdiction consists of seven zones – North, South, East, West, Central, South East and North East. An officer of the rank – Deputy Commissioner of Police heads each zone. Each zone is further divided into subdivision and each subdivision is headed by an Assistant Commissioners of Police [2].

For community policing and crime prevention, police introduced provision of neighborhood watch committee i.e. members watching their neighborhood turn by turn, join beat constables to perform night beats, inform police about any child or youth going astray, and arrange social and cultural get-togethers to understand neighborhoods [2]. These provisions are mostly non-technology based. Realizing the potential of OSN, Bangalore police started its Facebook page in the year 2011, for community engagement at the city level. The page has more than 100,000 likes and police allow citizens to post on this page, providing them [police] a two-way information-sharing mechanism. Residents use OSN to inform residents about various crimes and opinion on policing activities. Police time and again have emphasized that OSN should not be treated as grievance redressing systems. Similar to Facebook page, Bangalore Police also has a verified twitter account (@BlrCityPolice) which has almost 11K followers. Since the number of followers is less (almost ten times) in comparison to Facebook, in this study we look at Facebook use. We plan to do the comparison with Twitter in follow-up future work.

4.2 Data Collection

We selected the Bangalore community and studied their online interaction with police on Facebook Page to investigate OSN significance in community accountability and satisfaction to fight crime. We collected data from online Facebook page of Bangalore City Police and used different mechanisms to filter the required posts for analysis. To start with, we collected all the public posts posted from 21st July - 21st Aug, 2014 on BCP Facebook page. Since we are interested in studying resident’s satisfaction, we filtered all
posts and comments from residents to police. We used the filtered posts to understand, what did the residents used this page for? Next, we collected all the posts that were replied by police. In total, we collected 255 posts and 1,600 comments from residents. The collected posts and comments (from the police and residents) included only public posts and did not include private messages that people might have sent using Facebook to police. We collected all the metadata like time, date, story, and usernames through the Facebook API using a python script. We also collected likes and shares on these posts.

4.3 Data Analysis

We analyzed the collected data to understand communication content, style and engagement type. This was followed by analyzing the fear of crime and safety concerns that residents expressed in their posts and comments on the Facebook page. As used in previous research, we use inductive thematic approach (a qualitative method) to analyze the posts [16]. We coded the content and description of each post to study the emerging themes.

Communication content and style: Our analysis of the posts, resulted in a detailed categorization of the filtered posts. We read each post and the codes were iteratively examined and condensed. Finally, we had 40 codes that were grouped further into 24 themes (see Table 1) to show various crime and complaints that emerged from the Facebook page. We also analyzed whether the citizens report direct incidences of victimization (reporting a personal experience) or if the page received indirect victimization (report crime that happened with somebody else) posts. Next, we developed a coding scheme to understand communication style used by police and residents on OSN, i.e., whether they used formal or informal language to communicate with citizens. We also performed lexical analysis using word trees to understand the fear of crime and safety concerns among residents.

<table>
<thead>
<tr>
<th>Theme</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missing</td>
<td>Missing people</td>
</tr>
<tr>
<td>Promotional</td>
<td>Promoting products for policing</td>
</tr>
<tr>
<td>Query</td>
<td>How to get police assistance, where to complain</td>
</tr>
<tr>
<td>Traffic</td>
<td>Traffic menace on roads</td>
</tr>
<tr>
<td>General resource information</td>
<td>Information regarding police stations etc.</td>
</tr>
<tr>
<td>Please theft</td>
<td>Stolen phones</td>
</tr>
<tr>
<td>Hit and run</td>
<td>Road rage</td>
</tr>
<tr>
<td>Case inquiry</td>
<td>Seeking progress on pending cases</td>
</tr>
<tr>
<td>Online fraud</td>
<td>Nigerian Scam, Credit card fraud etc.</td>
</tr>
<tr>
<td>Resident dissatisfaction</td>
<td>Dissatisfaction with policing working</td>
</tr>
<tr>
<td>FIR issue</td>
<td>Cases FIR was refused</td>
</tr>
<tr>
<td>Greetings</td>
<td>Good wishes to community and police</td>
</tr>
<tr>
<td>Fraud</td>
<td>Real world frauds e.g. Property Fraud, financial fraud</td>
</tr>
<tr>
<td>Police misconduct</td>
<td>Behavior issues with police</td>
</tr>
<tr>
<td>Theft</td>
<td>Burglary and stolen vehicles</td>
</tr>
<tr>
<td>Suggestion</td>
<td>Suggestion to improve policing</td>
</tr>
<tr>
<td>Construction issue</td>
<td>Illegal construction and construction hours</td>
</tr>
<tr>
<td>Community action</td>
<td>Residents requested by fellow residents to come together and fight crime</td>
</tr>
<tr>
<td>Auto-driver</td>
<td>Problems with drivers of public transport e.g., Autorickshaw, Taxi, Buses etc.</td>
</tr>
<tr>
<td>Neighborhood</td>
<td>People making menace in local society, e.g. hawkers, drunkards etc.</td>
</tr>
<tr>
<td>Women harassment</td>
<td>Women sexual assault</td>
</tr>
<tr>
<td>Success story</td>
<td>Posting about solved cases</td>
</tr>
<tr>
<td>Appreciation Post</td>
<td>Appreciating police for good work</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>resident satisfaction on solved cases</td>
</tr>
</tbody>
</table>

Engagement type: Engagement type includes four categories: acknowledge, reply, follow-up and ignore posts (See Table 2). Acknowledged posts category consisted of the post that police liked or wrote “thanks for sharing the information.” Reply category included the posts to which police suggest a solution, follow-up posts consisted of posts in which the complainant resident asks for further information or police asks for more details. Finally, ignored posts were those posts that received no reply from the police.

<table>
<thead>
<tr>
<th>Type</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acknowledge</td>
<td>Like or say thanks for information</td>
</tr>
<tr>
<td>Reply</td>
<td>Suggest a solution</td>
</tr>
<tr>
<td>Follow-up</td>
<td>Ask for further details</td>
</tr>
<tr>
<td>Ignore</td>
<td>No reply</td>
</tr>
</tbody>
</table>

5. FINDINGS

In this section, we first discuss the different communication elements i.e. content, style and engagement. Next, we show how OSN data help understand fear, direct and indirect victimization, and needs of residents.

5.1 Communication Content

To understand whether actionable information was available on this page, we analyzed the type of content posted on BCP Facebook page. Figure 2 shows the percentage of resident’s posts (N=255) related to categories shown in Table 1. Maximum complaints that residents posted were related to neighborhood safety (36 posts), e.g., “Today I saw some drunk boys fighting with the staff of Temptation lounge bar in Koramangala behind Legend of Rocks. They had hockey, knife and daggers. After fighting one of them who was drunk too much started fighting with a boy and two girls going on the road in front of Balaji temple …. Please look into this matter and put curb on such incidents in the future. Thanks.” Neighborhood issues were followed by posts appreciating police work (31 posts), for instance, a resident posted, “Congratulations MN Reddi for your swift action within days of taking a new post!” Suggestion to police was the third largest category of posts, e.g., “Hi, Sir today everybody uses smartphone or high end costly mobile phones and there are lot of lost phone cases unsolved in this regard the police can setup [make] a separate team to solve the cases. Hope you will think about it.”

Next, we analyzed the categories of posts that most residents liked and commented on (See Figure 3). The posts that were most liked included appreciation of police work and success story shared by residents. The next category of posts that were most liked by residents were women harassment posts and posts including cases of women sexual assault. For example, “Dear Bangalore City Police, eve teasers [common term for people harassing women] are increasing day by day. Bus stops, auto stands, college gates, etc. are becoming nightmares to women. In and around majestic bus stand, the problem is even worse. Today’s eve-teaser may turn into a rapist tomorrow, so please take action.” The 5th most liked category was neighborhood issues such as street violence, issues with street hawkers, car parking issues, and unidentified vehicles. Resident’s post regarding dissatisfaction with police working and police misconduct got least likes and comments from residents.

From 255 resident’s posts, police responded to 172 posts. Maximum cases that received police response were about neighborhood safety issues (11.48%) followed by suggestion for using new technologies and improving security in particular areas (9.02%). Police did not reply to posts that encouraged or appreciated their work; however, police liked such posts to acknowledge observing them. To most residents’ suggestion, police replied that the police department was planning to implement them.
We found that people posted queries, gave information, made complaints, appreciated police efforts and provided feedback on different policing activities using BCP Facebook Page. Apart from the type of concern, these posts could be used to assemble actionable information as spatial data (See Figure 4) and temporal data about the crime. For example, a resident posted “Saturday evening. Time – between 5.30 pm and 6pm. Location: The circle between Freedom Park and the route that goes into Cubbon Park, towards Century Club. Not a single police posted here. I was waiting for an auto at the circle and these two guys rode by asking if they could drop me. …Please ensure there are police put here for safety.” The posts on Facebook Page helped police to know direct, persistent, and most apparent concerns of the residents.

5.2 Communication Style

On comparing communication style, we found that residents used a mixed style of communication including both informal (187 posts) and formal interaction (68 posts). Some residents while expressing their concerns, disagreement and dissatisfaction used formal words like “Dear” or “Respected Sir”. For example, “Dear Sir Request to take action on Railway Station parking contractors they are not issuing parking slips . . . today @Yashwanthpur Railway Station Tumkur Roadside Entrance Parking.” While using an informal style of writing, residents used words like “hi BCP” and slangs like “Kudos”, “pls”, etc. For instance, “Kudos to the Banasawadi Traffic Police Team. My Salute and sincere thanks to the Banasawadi

Traffic Inspector XXX . . . An ANGEL in disguise.” Residents also used violent words like “kill”, “hang”, or abusive words while expressing need for punishment to criminals. A resident posted, “Kill him [criminal]. Feed him to dogs or wolves or rats. Zero tolerance.”

In comparison to residents, police always used a formal communication style of writing. While replying to resident’s posts police politely addressed resident with their name and used words like “Dear XXX”, before replying with a solution to the issue. However, if residents continued to complain about the issue, police chose to repeat the same answer as given before or not reply. Police used words like “please” and “kindly” while asking residents to provide information about the crime. Police expressed their gratitude words like “thanks” while acknowledging resident’s posts. “Dear XXX, Please provide the exact landmark. Thank you.” This strategy to engage in online conversation with residents through OSN such as Facebook can become an efficient instrument that help police always stay visible and connected with residents.

5.3 Engagement Type

To analyze, whether police Facebook page was becoming just repository of complaints and suggestions, we assigned each resident post with a type of engagement (acknowledge, reply, follow-up, and ignore). We found that the police chose to react to 172 posts from residents, ignoring 82 posts. Among the 172 posts to which police replied to 43.44% complaints and said that the posts were forwarded to the concerned police station, officer-in-charge, or higher authorities like commissioner of police. For instance, a police comment stated, Dear XXX, This post has been forwarded to appropriate Police Station for taking necessary action on this. Thank you. Almost 22% posts were suggested to contact the police station with the necessary details, e.g. Dear XXX, Please lodge a complaint at your nearest police station with the details and contact police inspector in this regard. They will assist you further in this. Thank you. For 21.31%, police acknowledged the residents with a thanks or a reply that they will look into the matter, for example, “Dear XXX, We will take all possible legal measures in this regard. Thank you.”

Almost 10% posts required follow-up as these posts needed to contain more details for the police to help residents. Police commented on such posts asking residents to post more details. For instance, “Dear XXX, Please provide the police station details. Thank you.” Among these posts that needed follow-up from residents, we found that 29 posts were such in which residents replied back to the police.
5.4 Understanding Fear

Research shows that “crime weakens the fabric of social life by increasing fear, suspicion, and distrust. It also reduces public support for the law, in terms of unwillingness to report crime and criticism of the police.” [17] We analyzed, how people used Facebook page to express their concern and fear. We found multiple occurrences of words like fear (occurred 7 times), concern (occurred 8 times), worried (occurred 6 times), trouble (occurred 4 times), notice of (occurred 13 times) and issue (occurred 22 times). Mostly, residents were fearful of self-causality; residents who were victims of some crime mentioned being worried (See Figure 5) about more harm being caused to them and used OSN to call for police help. Residents feared that somebody might misuse stolen vehicles and documents. Some mentioned threat of being attacked or being traced by offenders. Residents used word notice to get police attention on their fear or concern.

Figure 5: Shows popular discussions on BCP page where citizens mentioned being worried about crime and safety. Word Tree visualizations of popular discussions on BCP page where citizens mentioned “worried”. The visualization shows phrases that branch off from “worried” across all the text in the posts. A larger font-size means that the word occurs more often.

Apart from direct mention of the word fear and worried, we found multiple occurrences of various words such as concerned, troubled, and issue, showing the fear and dissatisfaction in the policing activities. Lexical analysis shows, participants mentioned being concerned about police station, control room or officer not taking necessary action, when needed. For instance, a resident posted, “This photo [of a criminal incident] is taken just less than 30 meters of Surana College, South End Circle - in this road Asst. Commissioner of Police office is also situated - This Sidvin Condiments person sells Cigarette, Pan etc., to college students and there is one software company also there next to this shop - many people smoke in front of this shop also on the Footpath - there are many police personnel who pass on this road but are silent spectators!! This is our Kanoon [Law] and it is this the way of maintaining law and order in Bangalore.” Residents said that as concerned residents, they would like to know what actions police took. In some posts, residents said that they hope, the concerned police officer would contact residents to solve the problem. Some people expressed fear of going to the police station to report issues.

5.4.1 Report Victimization: indirect or direct

Victimization theory shows fear is a consequence of either direct or indirect experience with the crime event. We found that Facebook page was used both to report direct and indirect victimization cases. We found that out of 255 posts, 91 posts (35.68%) reported direct cases of victimization, 61 posts (23.92%) reported indirect experience of a crime. In indirect experience, residents witnessed a crime but were not victims of it. Rest of the posts were of a different nature such as appreciations, greetings, or the general query that did not represent direct or indirect victimization.

While reporting direct victimization cases, residents posted how they were victimized and requested police to take action. For example a resident said, “My Vehicle KA-02-HW-3183 white color Honda Dio was stolen from Kadamba Hotel[Near Modi Hospital], RajajiNagar on Friday25th July) evening between 6:30-7:45PM. Please help in tracing my vehicle.” In few direct victimization posts, one individual, on behalf of a group, complained of being victimized and used words like “We faced”. For example, a resident posted, “Hi Bangalore City Police, We are facing many hassles with Auto Rickshaws operating from a stand near Vydehi Hospital, Whitefield. . . . We would appreciate if you could take immediate action against this and help us out. I am sure residents of Whitefield and near around areas will be thankful!!” This showed a form of collective action against crime (self-experienced) that informed police that it was a problem for many people.

While reporting indirect experience of a crime, residents posted the details of a crime they witnessed and expected police to help the victims. Indirect victimization posts indicated collective action in which residents supported other residents from being victimized. “Dear BCP, though I stay at JP Nagar, but being part of KSFC Layout RWA (Banaswadi Police station), I got to know that there are frequent problem at KSFC Layout near BBMP Hall . . . 8-10 youths were creating a public nuisance > (shouting, boozing, manhandling, etc.) yesterday i.e. on 27/7/14, Sunday night 9 pm. We need your support to help avoid a molestation scenario at KSFC Layout. Thank you” This showed a form of collective action against crime (not faced by complainant him / herself) but informing police that it was a problem for many people.

5.5 Online Public Communication: Increased Accountability

Facebook provides opportunities for police organisation to obtain information about what frustrates public and hold its officers accountable. Using Facebook, residents asked questions which held police accountable for their action and functioning. For instance, a resident posted “Where is our police? Seems like these criminals are not scared of anyone... SHAME!!!” Also, Bangalore police also actively participated on this platform supporting organisational policy of public accountability. Police maintained their communication style even while answering to frustrated residents. Figure 6 shows one such conversation between police and a resident. A resident said, “Dear Commissioner of Police, After all these rapes, molestations and kidnappings occurring in cars and vehicles with tinted cars, how is it that we can see so many cars and buses, and especially school buses plying around with their vehicles tinted? or curtains inside that block the windows? Doesn’t it encourage and embolden the criminals? Why aren’t all the const-
stables empowered to punish the drivers of tinted or curtained vehicles like cars and buses, on the spot?" Police responses followed the protocols and policy of official responses. This strategy shows that OSN based communication can change dissatisfaction among residents to accountability on an online public platform.

**Figure 6:** Police maintained their communication style while answering to frustrated residents.

We found that OSN also helped residents to express discontent about some of the official protocols. For example, a resident posted about police solving women sexual assault case, “Skating instructor held for 6-yr-old’s rape. A 30-year-old skating instructor was arrested on Sunday on the charge of raping a six-year-old student at Vibgyor High, Marathahalli.” This post was followed by a flurry of comments from public expressing concerns such as delay in justice for such victims and killing the culprit. For instance, a resident said, “Why can’t you shoot at his head.” These conversations continued for quite a while, and the post was among the top commented posts (532 likes, 184 comments). Responses were sent to and fro by the community members. Police, however, chose not to be part of these conversations and did not reply to these comments. This kind of OSN usage leaves an open question that how exposure to crime news influences the community opinion about police.

We performed lexical analysis with word trees using words such as why, where, which, how can. Figure 7 provides a deeper view into the structure around the accountability posts using word tree visualizing use of why. This analysis helped us to understand different ways residents held police accountable. Residents questioned why police functioned in specific ways. We also found instances, where residents reported need for mutual accountability. There were multiple posts in which residents accepted that they had equal responsibility (as the police) to keep the city safe (See Figure 8).

**Figure 7:** Word Tree visualizations of posts in which residents questioned police using the word why.

**Figure 8:** A post showing that residents accepted that they had the equal responsibility (as the police) to keep the city safe.

One of the prominent need that residents posted was asking for more resources to improve policing. These requests included needs such as increased patrolling, more CCTV cameras, the need of police on OSN and developing mechanism using which people can take an instant picture and send to the police for immediate action. For example, a resident posted, “Congrats Mr. M N Reddi. The safety of womanhood is with you and your team. A small suggestion: Make mandatory to install CCTV at all public and private institution; ... with better CCTV at the entrance for their venue. This will bring additional check and help.”

While mentioning the need to strengthen legal procedure and police resources, residents discussed developing a strict law system and giving strict punishments. For example, a resident posted, “He [criminal charged with a girl’s sexual assault] should be hanged till death! I am scared to send my little ones to the school!” The residents felt that they were dependent on police to make the city safe; e.g., a resident posted, “Sir, will this punishment stop him attacking women ever in his life.... honestly this is not enough. We want a safe city and we are dependent on you.” The posts show the residents’ concern and expectation that police need to be ‘on top of things’. These posts also demonstrate the extent residents’ think police should react to offenders if needed. This post also shows that residents believed giving harsh punishments could be a way to reduce crime in the city.

### 5.6 Understanding residents’ needs and wants

Research shows that increased fear and anxiety can be encountered, if the police know what residents expect and want from the police. The expectations of residents, if met, can increase feeling of safety in community [17]. We performed lexical analysis to understand what are residents need and want from the police. The word tree in Figure 9 summarizes the needs and wants of the residents. The word need occurred in 48 time and want occurred 17 times in posts and comments. The analysis shows major needs of the residents could be clubbed into two categories, a) need for more resources and b) need to punish, strict legal system, need to take issues with senior officers.

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### 6. DISCUSSION

In this paper, we study OSN role in improving Online Public Communication between police and residents for: a) obtaining actionable information related to crime; and b) evaluating resident’s satisfaction with safety that police provides in urban cities. The results show that OSN use by residents to reach the police needs to address a combination of technical and social science challenges: **Observable OSN for Actionable Information and Collective Action:** We find that people posted relevant queries, shared informa-
Tree shows occurrence of the word “need” in the posts and comments. The size of word increases with multiple occurrences.

Tree shows the occurrence of word “want” in the posts and comments. The size of word increases with multiple occurrences.

Figure 9: Word Tree visualizations of posts in which citizens expressed want to or need to tell their needs to police. This tree shows phrases branching from phrases “need to” and “want to” in the text from our dataset. The word that occurs more frequently is larger in size.

made complaints and provided feedback on different policing activities using BCP Facebook Page. Police can use residents’ posts and comments posted on the Facebook page to collate actionable information on the type of the crime, location, and time of the crime. Residents’ posts that receive the maximum reply from the police is about neighborhood safety (11.48%) followed by residents suggestion for using new technologies and improving security in particular areas (9.02%). Analysis of BCP Facebook page shows that active participation of police to answer resident’s queries is also needed to make OSN useful as a crime prevention tool. In our study, police responses are grouped into four categories – acknowledge, reply, ignore, and follow-up the post. Police efforts to answer residents’ post show that when OSN is used as a Crime prevention technology; it should offer social engagement that includes facilitating problem-solving discussions and allowing citizens to participate in collective action. Residents use OSN to express safety concerns and needs and police can use this information to prioritize policing activities based on citizens’ input. This prioritization can be used to address the crime early and can help improve citizens’ trust in law and order.

In order to maximize OSN advantage in providing actionable information, technologists should consider making OSN tools more “observable” for both police and residents. Police on OSN may receive a large volume of posts at a high velocity. For this, new tools with better functionality can be developed that help police to observe, respond, and follow-up with residents. We find that currently there are no means to mark posts that need a reply or follow up, differentiate posts that just need an acknowledgment of thanks.
and should not be mixed with crime critical messages. Similarly for residents, observable interfaces can help identify posts of interest. We find that most of the suggestions by the police to citizens were repetitive, e.g., meeting the concerned authority and asking for more details. If OSN is made more observable, then residents can easily get this information from existing posts. Making OSN “observable” can make addressing crime easy and efficient.

**OSN as Instrumental communication platform:** We find that so far police choose to adopt a very formal communication style while interacting with residents on Facebook. This style is governed by organizational goals to forward complaints to appropriate officers. Police try to maintain distinct police - public relationship by, not getting into descriptive assistance for residents. Thus, police followed an instrumental approach on OSN [29]. Literature shows police often fear situation going out of control while publicly interacting with citizens that lead to wrong impressions about police organization [20]. Literature also shows police’s decision to use an instrumental approach could be to avoid high maintenance, overstepping of organizational boundaries; easy polarization of public opinions (as required by the expressive approach) [12]. Following the instrumental approach support such findings in the literature.

The literature on communication for the modern organization shows that organizations that follow expressive approach while providing service tend to enjoy a longer and satisfactory association with users [29]. Residents, however, use an informal approach to reach the police and other residents for improving policing. These posts contained detail explanations, slangs, and personal experiences. Such interaction in literature is considered as expressive approach and is expected to increase the longevity of an organization. However, being extremely expressive on OSN can invite problems. In some cases, citizens were arrested because of mentioning comments on OSN that hurt community feelings [3]. There is a need to design technology that can assist users to identify information that is not law abiding with curtailing the freedom of speech.

**OSN to contact concerned authorities:** We find that by using Facebook, police informs that the resident’s post is forwarded to the concerned authority and in some cases, police request citizens to reach the specified police station with details of the crime. However, police do not give immediate solutions through OSN. A reason to ask citizens approach the police station or authority rather than giving immediate solution can be that the police need to verify the information posted on Facebook. In some cases, evidence such as Facebook image are secondary evidence and, therefore, need verification [1]. This strategy of asking citizens contact police station can also help reduce false reporting. It would be interesting to analyze how many residents who are asked to contact authorities do so and how much is the assistance offered by these authorities useful for residents.

**OSN for Mutual Accountability:** Our results show that OSN offers various opportunities to improve accountability and introduce transparency in the community policing process. We find that using OSN police help residents reach the concerned authorities. Police also accept resident’s complaint publicly on police misconduct and replied to citizens about actions being taken. This can help reduce the anxiety and dissatisfaction among the residents. These results are aligned with the literature that shows for success of community policing platform accountability is essential [12]. OSN is used considerably by residents to spread positive work of police and success stories. Thus, as suggested by victimization theory, the posts containing good work, success story and appreciation of police can help to generate feeling of being protected among residents. Residents publicly discussed and informed police about threats and concerns which were to a large extent acknowledged by police and other residents. These exchanges could have helped address residents’ accountability concerns.

**OSN for Understanding fear and Victimization effects:** Developing countries have been using individualistic technology solutions such as helplines to assist victimized citizens whereas community policing has been largely non-technology based. Victimization theory and OSN use of police give a larger perspective that technologies that encourage collective action can be designed for effective community policing. OSN use when combined with . Victimization theory’s concepts can help predict factors that induce fear or increase feeling of safety through collective measures. We see that residents posted various experiences where they mentioned fear, trouble, worry, and concern after being victimized. Facebook page offered opportunity for police to understand citizens’ fear using this data. Victimization theory suggests that individual complaints and attempts to fight crime result in community disintegration and isolation of individuals. We find that OSN offers an opportunity to reduce the number of residents who try to fight crime individually and seek police help. A large number of residents post direct victimization cases where they experienced crime. The individual who is a victim of a crime gets support from other residents in the form of comments, likes, and probable solutions. Some of the posts also echo safety concern and help others to lodge complaints on behalf of individuals whom themselves cannot express crime. Thus, converting the individual action to a collective response.

### 7. CONCLUSION AND FUTURE WORK

In this study, the results show that police can use OSN to obtain actionable information like location, place, and evidence of a crime using OSN. Police adopt formal and polite communication style on OSN to address resident concerns. We find that the police uses different types of engagement with residents. Police helped victimized residents reach the concerned authority and forwarded complaints to appropriate departments. Also, police used OSN to acknowledge residents for their suggestions and appreciation for police. Our results show that OSN offers an opportunity for public accountability of police and residents for policing. This transparency can be used to increase accountability and to foster trust in the police. The posts can help to generate feeling of being protected.

We plan to use this information to design systems that can assess: a) actionable information available through Facebook page and forward it to the concerned authority and b) track the engagement type in each post for instance, was the post acknowledged, does it need a follow-up or a reminder, mark the posts which don’t require further action so that actionable information is not lost in the flurry of posts. This can help to improve residents’ satisfaction by maximizing the number of posts that police answers. The system will be able to highlight the reply of police to the residents for future reference. Data persists to stay on online social networks; we plan to assess how this information can be used to suggest residents facing similar issues to avoid delay in action. In our system, we also plan to use the content from Facebook to assess resident’s behavior towards crime and safety. Authors are aware that police in India use other platforms like Twitter and YouTube; however the number of residents following the police on Twitter and YouTube is far less than Facebook. We leave the comparison of police presence on different OSN platforms to understand the complete OSN strategy for future. Also, we plan to do comparison of our data with police in developed countries for future.
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9. REFERENCES


