

# Finding & Evaluating Community Policing apps in Asia

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## ABSTRACT

The ubiquity of mobile devices creates new opportunities for the police to engage with citizens anywhere and anytime. However, there is limited academic work evaluating these technologies. This paper reports on a review study of Android community policing (CP) apps used in Asia. Our study indicates that in the absence of guidance, finding appropriate Asian CP apps is challenging. This paper reports the descriptive app Store characteristics, functionalities, communication channels, and privacy features of CP apps. We conclude with some design implications and call for developing a standardized app store description system and an evaluation model to help users find and select appropriate CP apps.

## Author Keywords

Community policing; mobile app; HCID; police; crime.

## CSS Concepts

• Human-centered computing~Human computer interaction (HCI) ~HCI design and evaluation methods ~Heuristic evaluations

## INTRODUCTION

Community Policing (CP) aims to improve the relationships between the police and citizens by involving people in policing activities [14]. Although the concept of CP is widely adopted and explored, there are challenges to making the transition from traditional policing to CP [11]. Moreover, due to variation in the implementations strategies adopted, there are many debates on the effectiveness of CP in practice [6,9], especially in developing countries. There is evidence that information and communication technologies (ICTs) provide opportunities for enhancing e-policing and digital civic engagement [12], with much HCI work focusing on online community usage behavior [5], social media e-policing systems [8], and designing new technologies facilitating community engagement in policing [3,10]. However, there is a lack of reported evaluations of the CP technology in scholarly research. Furthermore, we did not find a reference

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to the evaluation of CP mobile apps in the app Store.

Our work addresses these gaps by exploring the community policing techniques underpinning Asian Android CP applications. We focused on the Android operating system because 85.9% of mobile device market share in Asia is Android<sup>1</sup>. We asked three research questions: 1) what apps are available for Asian citizens to engage with the police in a digital way? 2) what are the key functionalities available in the Android App Store? 3) do these apps support users' privacy? We propose design implications and call for developing an app Store description standard and CP app evaluation model. Our work aims to encourage more nuanced discourse of CP technology and their evaluations.

## METHODS

The apps were identified by searching for a combination of keywords (*community*, *neighbo(u)rhood*, *smart*, *community-driven*) + *policing* + (*engagement*, *collaboration*, *communication*) via a standalone scraping tool *Parsehub*<sup>2</sup> on the UK Google Play store, between 1<sup>st</sup> July to 4<sup>th</sup> July 2019 (inclusive). Each app's marketplace information was downloaded automatically, including name, developer, category, rating, number of reviewers, price, and latest update date. This resulted in 3078 apps after removing duplicates from a total of 16235 apps.

## App Selection

3078 apps were reduced to 1207 apps after excluding games and training apps. Then the first two authors categorized 1207 apps as either "not relevant" or "relevant" based on the app title, description, and screenshots available in the app store. The "relevant" apps were included in the final analysis if they met three criteria: 1) Asian country names were in app's title, or developer, or app description; 2) the app supports the interaction between the police and citizens; 3) the app has an English-language interface. After independent screening for relevance, two reviewers resolved the disagreements by consensus.

These criteria led to 32 apps from which we further excluded two apps due to geographic restrictions and two apps failed to be installed. The remaining 28 apps were organized based on the citizen-police communication channel and app's ownership, e.g., 2-way communication police app, 1-way communication, third-party app, etc.

<sup>1</sup> <https://gs.statcounter.com/os-market-share/mobile/asia>

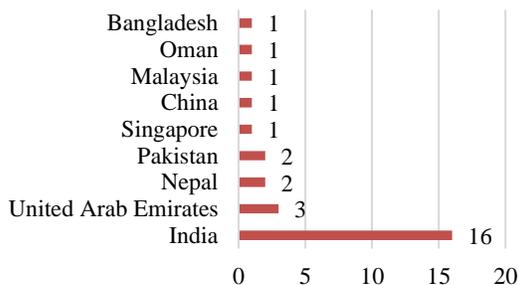
<sup>2</sup> <https://www.parsehub.com/>

## RESULTS

Our findings are organized into two parts. First, we outline an overview focusing on finding descriptive app characteristics and functionalities; the second part reports in more depth about the communication channels and user privacy features of the apps.

### Overviews

Findings indicate that there is a lack of community policing apps in Asia compared with the West (mainly the US and Canada). Of 1207 apps, only 4.06% of apps were designed for Asian countries (see Figure 1). Without guidance, finding an appropriate Asian CP app on the global market may be challenging, and in many Asian countries, there is no provision at all.



**Figure 1. The number of CP apps in Asian countries.**

### App Developers and Affiliations

There were 28 app developers in this study, 71.4% of which (20/28) were either police (53.6%, 15/28) or government institutions (17.9%, 5/28). However, only 11 apps (41.4%, 11/28) provided an official contact email address (e.g., @xx.gov.yy) in the marketplace. A total of 8 app developers (28.6%, 8/28) indicated that they were a commercial developer, 2 of whom developed CP apps by collaborating with the police.

### Categorization

The 28 apps reviewed in this study were categorized into 9 categories used to describe apps on the Google Play store. The most popular category is Social (25%, 7/28), followed by Communication (21.4%, 6/28), Productivity (17.9%, 5/28), Tools (14.3%, 4/28), News & Magazine (7.1%, 2/28), Auto & Vehicle (3.6%, 1/28), Business (3.6%, 1/28), Lifestyle (3.6%, 1/28), and Travel & Local (3.6%, 1/28).

### App Ratings

Of the 27 rated apps, there was an average of 2721 raters per app. The average rating was 4.21 stars (out of five stars).

### Targeted Audience

Over 92% of the apps were listed as suitable for everyone in the marketplace (PEGI 3). Parental guidance was recommended by 7.1% of the apps (2/28). However, we did not find any customized design for minors using the apps.

### Costs

All of 28 apps were free to use. Only one third-party app embedded Google Ads.

### Police Involvement

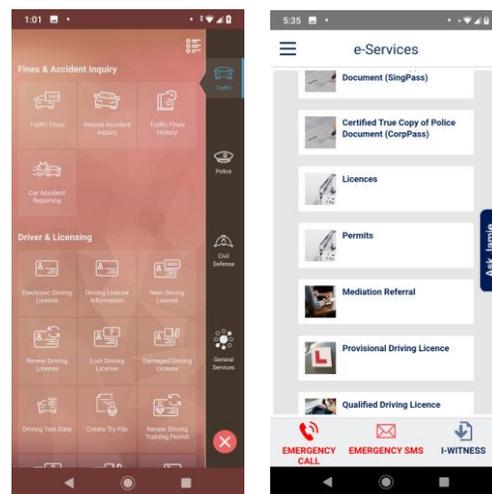
Based on the app description and developer information, 82.1% of the CP apps (23/28) were developed by or in collaboration with the police, 87% of these police apps (20/23) use the police force's badge as app icon or on the user interface. One-fourth of apps indicated they were the "official" app of the police in the app store description. One commercial app from Pakistan mentioned in the app store description that citizen's reporting would be sent to the desired department, and one commercial app from Nepal claimed that police could be reached in the emergency case. These strategies increase the credibility and reliability of the app to potential users. However, we could not evaluate the content source at this stage.

### Functionality

An important finding is the prevalence of CP apps supporting civic engagement, which focus on providing a portal to civil services, such as checking the status of passport, visa, and driving license (see Figure 2).

Six-sevenths (24/28) of the apps had the main purpose of providing information about traffic (17.9%, 5/28) or policing information, or local community (7.1%, 2/28).

The other main functionality categories were crime reporting (28.6%, 8/28), making complaints (17.9%, 5/28), and emergency communications with pre-defined contacts (10.7%, 3/28) or law enforcement (7.1%, 2/28).



**Figure 2. Screenshot of MOI UEA app (Left, from the United Arab Emirates) and Police@SG (Right, from Singapore).**

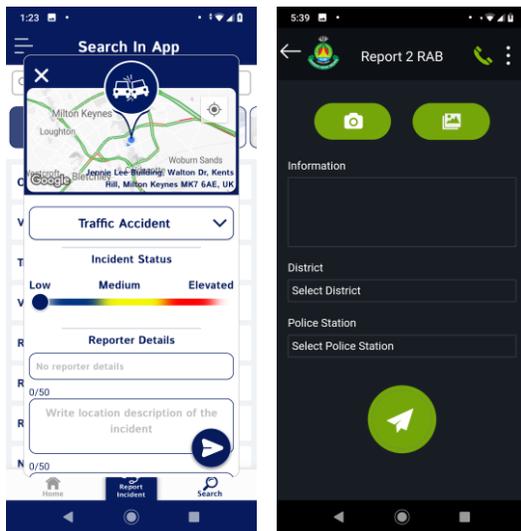
### Citizen-Police Communication Channel

The app that supports 2-way communication would have features for synchronous or asynchronous information flow between citizens and the police. A typical instance of this is a chat feature that allowed citizens to discuss a crime report (digitally) with the police (see Figure 3, left). Another example of 2-way communication apps contains both information gathering and information providing features, e.g., UPCOP app from Uttar Pradesh Police in India (Figure 3, right).



**Figure 3.** Screenshot of MOI UAE app (Left, from the United Arab Emirates) and UPCOP app (Right, from India).

The 1-way information flow includes features that allowed police forces to broadcast information to the public (e.g., crime maps, ‘wanted’ listings, news feeds); or provided citizens the ability to report crimes or make complaints without any feedback capabilities.



**Figure 4.** Screenshot of ROP-Royal Oman Police app (Left, from Oman) and Report 2 RAB (Right, from Bangladesh).

62.4% of the apps (18/28) included 2-way communication, of which we only identified two third-party apps. In contrast, 21.4% of the apps (6/28) only provided information to the public, while 14.3% of the apps (4/28) allowed citizens to only report information.

### User Privacy

The privacy was evaluated based on the availability of a privacy policy, account registration, and anonymous reporting features of the app.

### Privacy Policy

We only found the privacy policy or the terms & conditions for 28.6% of the apps (8/28).

### Account Registration

39.3% of the apps (11/28) required registration at the first step when using the app. In comparison, 21.4% of the apps (6/28) can be accessed without any registration, of which only one app (commercial developer) allowed users to report suspicious activity without an account. 28.6% of apps (8/28) provided information access without logging in except for reporting things. Some apps required the local mobile number or citizen ID for registration.

### Anonymous Reporting

Only two apps in the sample (7.1%, 2/28) allowed users to report crime anonymously.

## DESIGN IMPLICATIONS

As the app phenomenon continues to grow, users’ ability to find a reliable and credible CP app may become increasingly difficult. We discuss the opportunity for HCI designers to help users select the appropriate tool to engage with the police, particularly among those commercial apps.

### Standardized app Store Description

With 3087 unique apps identified in the initial sample, users may not have time to view and verify all the details on the app marketplace. Inspired by Shen et al.’s work [13] on evaluating the depression app marketplace, it is worthwhile to develop a framework to guide app publishers on how to represent their CP apps appropriately to potential users seeking mobile applications in policing. For example, including the content source, official contact information, and affiliations could provide useful contexts to assess the reliability and credibility of the app. Moreover, apps should make a clear differentiation about potential users, as practitioners or citizens.

### Safeguarding Users’ Privacy and Safety

The community policing apps translate traditional functions of the police authorities into digital services but overlook the importance of privacy and safety. Moreover, the functions of existing CP apps are rudimentary with minimal design. This outcome is not surprising, indicating a less explored design space in the policing world. We encourage HCI researchers to explore safeguarding strategies for protecting privacy and safety, especially for vulnerable users. In addition, there are new opportunities for HCI designers to mitigate the harm of exposure to negative content [4,15] and the “Copy Cat” action [2].

### Designing Guidelines to Evaluate CP Effectiveness

Similar to APA’s App Evaluation Model [1] for guiding the personal choice of mental health apps, we argue for the importance of developing a framework for evaluating the effectiveness of community policing apps, so that citizens can make informed choices based on evaluation outcomes.

## LIMITATIONS

This study represents a snapshot of CP apps found in the UK Google Play store in July of 2019. This work may have limitations in three ways. First, the mobile app market (both app lists and app store description) will have changed at the time of submission of this paper. For example, Google applied the new Google Play rating algorithm in August 2019 [7]. Second, the findings may not be representative of all CP apps available on the local market or other marketplaces as certain apps may be localized or licensed only to specific countries. Third, the compulsory registration with citizen ID and local mobile number, and ethical considerations (e.g., cannot submit fake crime report) limited the installation and trial of these apps.

## CONCLUSION

This paper reports the reviews of current Android apps for community policing available for Asian countries. Findings describe the descriptive app store characteristics, functionalities, communication channels, and privacy of 28 apps. We conclude with design implications and call for developing a standardized approach to app store descriptions and a CP app evaluation model.

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