

# **Technology Aided Community Policing For Senior Citizens**

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## **ABSTRACT**

Community policing refers to a collaboration between the police and the citizens who work together to build a safe and friendly neighborhood for the community. The elderly citizens form an important part of the community, and most of them having retired, or living alone, often tend to be creatively inclined. They spend their free time indulging in various sorts of creative work like writing stories, poetries, or even painting. Unfortunately, due to lack of contacts or physical viability their art work often goes unnoticed. We also put forth a solution as a community policing initiative by building an online platform to help the senior citizens create a reach of their art among the local newspaper journalists, who in turn can publish their work and help them gain recognition in the society.

## **CCS CONCEPTS**

+È Social and professional topics ~ User characteristics ~ Age ~ Seniors • Social and professional topics ~ User characteristics ~ People with disabilities • Software and its engineering ~ Software creation and management ~ Designing software

**KEYWORDS:** Community Policing, Senior Citizen, Android Application, Web Application, Journalists

## **1 Introduction**

The police are no longer solely responsible for maintaining law and order in a neighborhood. The association of the police force with the native citizens is termed as community policing [1]. This collaboration mainly aims at creating a better and safer community living experience for everyone by culminating positive and fruitful relationships between both the stakeholders, the police and the community members. This is regarded to be a two-way relationship, where the police must not only seek help from the citizens to prevent or control crime, but also address the issues faced by the latter and device appropriate solutions

[2]. Community Policing is a practice implemented on a local level rather than a national level, which makes it effective for dealing with different socio-cultural groups by limiting the population in jurisdiction, especially for a country with diverse demographics like India. Therefore, every city has its own separate policing initiatives to better deal with the citizens in concern [3].

This paper specifically presents a study of the community policing practice in Indore city of India, and how technology is being used to solve the problems faced by the citizens and to bridge the gap between them and the police. The study is targeted towards how the Indore police are engaging the elderly citizens into productive work and helping them cope up with loneliness, health issues and the feeling of being an outcast in the digital age, all under the umbrella of community policing. The objective of this research

paper is to produce a platform for citizens, senior citizens in particular to help them share their creative work like paintings, articles, poems and thoughts etc., with the newspaper journalists for publication in newspapers.

The paper is organized as follows: Section II explores some research papers related to community policing and how technology is being used in the society. Section III details the background of community policing and technology acceptance among senior citizens. Section IV explores the working flow and methodology to build the platform. Section V explains the implementation details and the result of the application of methodology described in Section IV. Section VI comprises of conclusion of the paper. Section VII provides details about future scope of this research paper.

## **2 Literature Review**

Drew Diamond, Deirdre Mead Weiss, in their work, established that more than 25 years ago, a few police departments began attempting to practice a new approach to policing that focused on improving relations between police and the corresponding communities they serve, and termed it as community policing[2]. They present the in-depth meaning of community policing by giving on field examples from various cities in the USA, while defining partnerships among police and municipalities, and police and the community. They highlight the importance of collaborative efforts to problem-solving among the community, and the need of organizational reforms to turn this to a far-etched reality.

Md. Nahidul Islam, in his paper presents in detail the concept of community policing and its significance in a democracy [3]. He draws example by describing the framework and the current scenario of community policing in Bangladesh, which is a developing country like India. The author establishes how Bangladesh police is trying to implement community policing on a national level as a part of a police reform program, and how the concept of community policing is very local in its essence, and must be implemented on a smaller level before shifting the focus country-wide.

Kumar, Ashwani, emphasize that the evolution of community policing is of great significance to a civilized society [4]. They put forth the idea that the increasing criticism and frustration of the general public against the police and generally the whole governmental machinery can be reduced to a great extent by adopting community policing as a philosophy and strategy to change the image not only of the police but the entire government functioning. They shed light on the various schemes and practices undertaken by the government and the police departments of various Indian states to walk an extra mile while adapting community policing as a work culture.

Brewster, B., Gibson, H. and Gunning M., in their work, describe that the community is made of different groups defined by the differing economic and cultural contexts that they bring on the table, yet they are all bound together. They also demonstrate a case study on the UNITY project, undertaken by many European governments [5]. This project pitches in a mobile app called UNITY, which is aimed at increasing the social capital of participating communities, essentially promoting the feeling of inclusion. The eventual motive of this app is to enable the different sects of the community to become self-organizing, and able to solve their own problems.

## **3 Background**

India is a very diverse land with people from different socio-economic and socio-cultural backgrounds living together. Effective policing can be a tricky feat here. Community policing has been a major transform in modern policing techniques, mainly because it promotes a sense of transparency, inclusion and trust among citizens in the governance process. With the advent of time, technological intervention is beginning

to find its place in the practice of community policing [5]. The Indore police, which comes under the Madhya Pradesh police of India, has been taking various initiatives to promote citizen engagement along with the assistance of contemporary technological improvements, like:

### **3.1 Youth Connect Programme**

It is a student internship scheme that invites college students from various streams to collaborate with the police officials, observe their daily working, and provide improvements from their learning. The primary motive behind this scheme, first launched in 2017, is to improve the image of the police officials, in contrast to the mostly negative and exaggerated portrayal in films and media consumed by the youth. On completion of the internship, the students submit a detailed report to head officials, listing their observations and areas of improvements, as recognized during their visits to several police stations.

### **3.2 Nagar Suraksha Samiti**

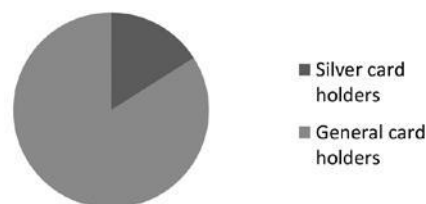
Also known as “Town / Urban Defense Committee”, it was established in 1996 in Madhya Pradesh with the aim to reach out young competent and committed citizens in police work. These citizens were then apportioned into numerous committees with each committee encompassing 10 to 15 members. These committees help in basic duties like crime control, traffic management, blood donation, tree plantation, etc. [4]. The committees and the work done by them fostered positive feelings towards the police and nurtured its social prominence.

### **3.3 Senior Citizen Committee**

The Senior Citizen Committee was formed with the motive to provide maximum benefit and relief to the senior citizens of each locality. The committee currently consists of 25,000 members, with a future goal to connect with 1 lakh senior citizens. These members include 4000 silver card members, that is, the ones who have no family and live alone, and the rest 21,000 general card holders who live with their families. The core committee members and volunteers reach out to senior citizens’ homes to help them continue with their daily routines by solving problems faced by them. The senior citizens are provided benefits and services by 72 hospitals, 20 pathology labs and 58 medical stores around Indore. Weekly meetings are organized, where they discuss issues, other schemes, and future growth as to how existing committees and programs like Youth Connect Programme can help other committees and senior citizens.

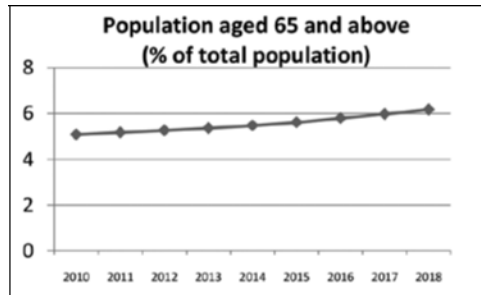
Most of the schemes under community policing interplay with each other to help accomplish their objectives. This paper details one such instance where a problem faced by senior citizens was resolved through a solution provided by interns under the Youth Connect Programme of community policing by Madhya Pradesh Police. According to the World Bank collection of development indicators, India’s Population ages 65 and above (% of total) in 2018 was estimated as 6.18%, which means there were approximately 83.5 million people aged 65 and above in 2018 in India [6].

**Senior Citizen Committee Members**



**Figure 1: Pie chart representing the Senior Citizen Committee members holding the silver and general cards**

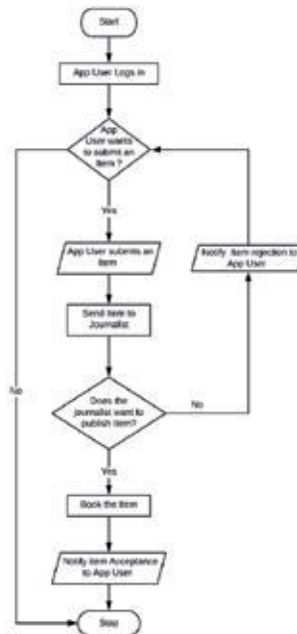
The elderly population has certainly been on a rise and clearly, they form a significant part of the Indian society. Most of these people have excessive amounts of free time at their disposal. A large number of them utilize this free time by indulging in creative work like painting, writing poems, etc., but a lot of this creativity goes unnoticed. The platform aims to give insight on this artistic work of the citizens and reward them with recognition and appreciation in the society by getting their work published in the newspapers without any hassle. This would further drive more citizens to participate in these activities, eventually spreading positivity and zeal amongst the people.



**Figure 2: Line graph representing the amount of population aged 65 and above in percentage from year 2010 - 2018.**

**4 METHODOLOGY**

The platform developed must serve the purpose of providing a medium that enables its users to relay their work with the journalists and receive updates about the approval or disapproval for publishing their work in a simple yet effective manner.

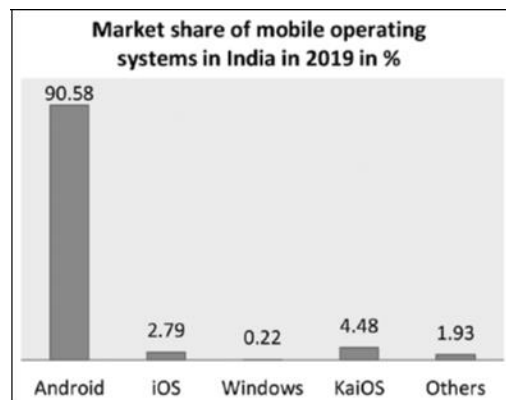


**Figure 3: Flow chart representing the flow of the system**

The platform comprises two primary components; a system for the users which enables them to share their creative work, and another system for the journalists that enables them to access the submissions made by the previously mentioned system’s users. Our target users for the making the submissions are senior citizens and most of them are not technically and physically sound. They cannot directly approach

the newspaper journalists with their work due to lack to appropriate contacts or lack of physicalviability. However, in this technologically advanced era, senior citizens have been showing an increasing interest in the digital technology and a noticeable amount of them are expected to have access to a mobile phone and an internet connection with middling bandwidth, therefore a mobile application is the most equitable choice to develop this system into. According to a statistic in 2019, Android dominated the market of mobile operating systems in India with 90.58% of the share [7].

So, it would be the most feasible option for a small team to develop the application for Android OS and ensure that the app is available for a substantial number of users. A large team can develop and cater the application on various mobile operating systems to further increment the number of users to whom the application would be accessible. The system for journalists provides them access to the submissions made by the users of the android application. They can also select a particular submission that they like for publishing, which would in turn be displayed at the author’s end. Journalists or the people responsible for formatting the print media usually use a computer to format and type the content, so a web application is more suitable as this would enable them to access app users’ submissions from their workspace computer, through a web browser, making their work much simpler and efficient.



**Figure 4: Bar graph representing market share of different mobile operating systems in India in the year 2019 in percentage**

Finally, a backbone for both the systems mentioned above; the backend, which stores, processes and provides data and services to the mobile and web application. The backend would be responsible for handling tasks like authenticating users, providing and storing image data to and from frontend components, storing, creating and updating user records in the database.

## **5 Implementation and Result**

### **5.1 Android Application for senior citizens.**

The android application for the senior citizens has been developed using Android Studio, which is the official IDE for developing applications for various types of devices based on Android. Java has been used for controlling the GUI components, defining logic for reacting to user inputs, displaying outputs, managing user data stored on phone storage and communicating with the server. Android Studio uses XML to design the screen layout, along with a drag and drop facility for the various elements, to ease the layout designing process [8]. XML was also used to write the resource files in Android that define the generic strings used, and the styling applied to the application. The android application consists of the following activities and fragments :

### **5.1.1 Login**

When the user clicks open the application, this is the foremost Activity which is displayed on his/her screen. This activity when loaded, checks with the firebase authentication service in the backend, if the user has already signed in to the app. If yes, then a welcome message with the user's name and email address along with a logout button and another button titled "My Creatives" is displayed. If the user has no matching record with the existing authentication records, they need to login first; therefore, a login button is displayed. So, when the user clicks on the login button, the user is provided with an option to sign in using Google accounts.

### **5.1.2 Submissions**

The Submissions Activity is the parent activity for three fragment activities that are displayed and updated depending upon user interaction. When this activity loads after the user clicks on the "My Creatives" button a new Fragment called "Submissions Fragment" is loaded which fetches and displays details about the submissions made by the user if any. To conserve device's memory and CPU consumption we have used a recycler adapter with a view holder. The recycler view, while displaying a list of items, loads only those items in the memory which can be fit inside the screen, instead of loading the whole list. It also recycles views instead of creating and destroying views every time an item is scrolled off the screen. Submissions Fragment also has an Extended Floating Action button, which, when clicked replaces the Submissions fragment with a new fragment called "New Submission Fragment".

### **5.1.3 New Submission**

The new submissions fragment allows users to capture a picture of their submission by calling an android intent for any camera application on the device when the "Take a picture" button is clicked. The user now has options to upload, retake or cancel the submission. If the user wishes to retake the picture, he/she can do so by clicking on the retake button, else the user can press the back button the on screen to cancel uploading a new submission, which leads them back to the Submissions activity. If the user selects upload button, the image is sent to the cloud storage and a refreshed Submissions fragment replaces the current fragment.

### **5.1.4 View/Delete Submission**

In the Submissions fragment, all the items inside the recycler view are attached to an "on Click" listener. This listener listens to the user's screen taps, and in case the user taps on a particular submitted entry's button, it responds by displaying an enlarged view of the particular entry. While doing this, it replaces the Submissions fragment with a new fragment called View Submissions. In this fragment, the system displays the image that was submitted by the user along with the title entered by the user and the timestamp of uploading. The user also has an option to delete the submission by clicking on delete button which then displays a dialog box to confirm the action then. If confirmed, the image is removed from the servers and a refreshed Submissions fragment is displayed on the screen reflecting the new changes.

## **5.2 Web Application for journalists**

The web application for the journalists has been designed using HTML and CSS, while JavaScript was used to make the application dynamic and to retrieve information about the submissions made by senior citizens using the mobile app, by interacting with the backend services. Visual Studio Code is the IDE used for developing the web application. The journalist, after successful login, can view the submitted files,

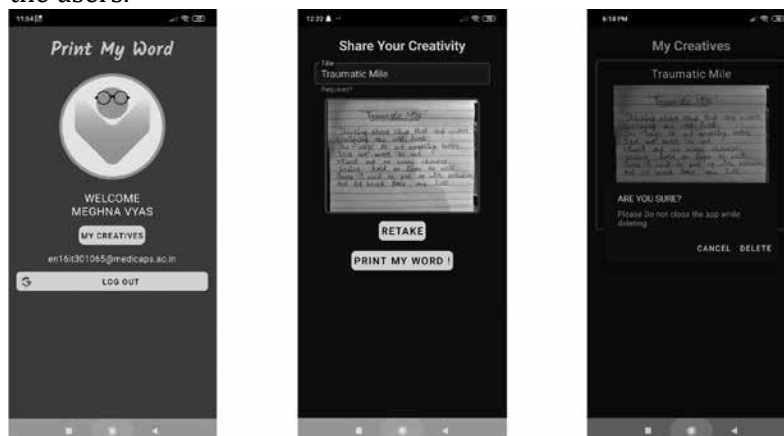
along with their corresponding details in a tabular form. If they wish to publish a particular item, he or she can click on the check mark to book the item to let the user who submitted the item know about its status and as well as to make other journalists aware that the item has been selected by another journalist for publishing. This helps avoid publication of the same data in different newspapers or other mediums.

### 5.3 Interface Design

The application interface has been made very simple yet effective keeping in mind the end users; senior citizens. The interface has been made in compliance with the Material Design standards, by implementing the guidelines for layouts, theme colors, typography, and environment [9]. The interface components have been well placed and sized to suit all the screen types. In our application, we replaced the basic AppCompatActivity components with Material Components like Material card, Material Button, Material Extended Floating Action Button. The application has a dark theme, which provides for a high contrast, and eventually increases the readability of the screen content.

As a result of a survey done with the senior citizen committee members, following were found to be the most desired user interface characteristics by the elderly aged from 60 to 80+ ,

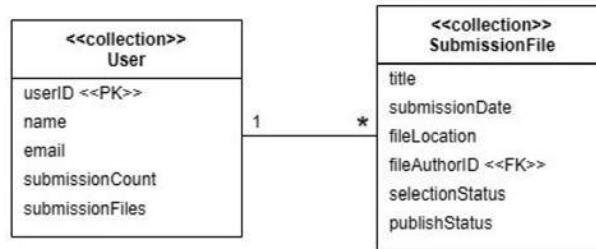
1. Large font size - This is the most important and most asked for requirement while designing an app UI for the seniors. Gradual vision loss due to ageing is the reason why the elderly find it difficult to read text which is smaller in size, and most of them have their phones set to display L or XL size fonts. Our application, therefore, uses scale-independent pixels (sp) for defining text sizes, which resizes the text as per the user's pre-existing text size settings and works well for varying screen sizes.
2. Simple to understand UI - The ageing process leads to a loss in the cognitive ability among the seniors, making it hard for them to process heavily animated interfaces. The use of complex graphics can be too overwhelming for them. Our application has a very simple user interface, with a navigation flow that is quite easy to follow. Also, fragments have been used to enable seamless transitions between screens, avoiding any delay or confusion among users.
3. Continuous feedback on task completion - When trying to upload or delete a submitted file, the users must be informed on the successful or unsuccessful execution of the task. We have used toast messages with a longer duration to display the status of the upload and delete operations performed by the users.



**Figure 5: App screenshots depicting the interface design: Login Activity, Submission Fragment, and View Fragment (left to right)**

**5.4 Database Design**

The application makes use of Firestore from Firebase as the database. Firestore is a cloud-hosted NoSQL database. Our database is structured into two collections, one to store details about the app users and another for storing details about each user’s submitted file; the snapshot of their creative work. A user’s unique ID, which is auto-generated at the time of document creation, is the primary key for each document in the User collection. It is also the foreign key in the documents corresponding to the particular user’s submitted files



**Figure 6: Document Data Model for the application database [10]**

**6 Conclusion**

Community policing is a practice that has been prevalent in our society since a long time. However, societal practices must not remain stagnant, but advance along with the moving times. Many problems faced by us, as a community, can be solved by a simple technological input. Our project-based study of the community policing measures taken by the Madhya Pradesh police in India provided a great insight into the lives and hardships faced by the police officials, along with their never-ending urge to serve the society in any possible way. We can see that it is an indisputable fact that the senior citizens are an inseparable part of our community, and we cannot turn a deaf ear to their needs and aspirations. The Print My Word platform has been developed for senior citizens, which makes it effortless and uncomplicated for them to reach out to newspaper and magazine journalists with their creative work like paintings, poems, life stories and etc., and get them published. The platform has been developed to be very user-friendly for both the end stakeholders; the senior citizens and the journalists.

**7 Future Scope**

The application has been made as simple as possible for the end users, that is, the senior citizens, due to the lack of their technical expertise. So, they simply have to take a snapshot of their work and upload it with a simple button click. However, this makes the task a bit tedious for the journalists to interpret text from the image and manually recreate it on their machines by typing. As the police department comes under the government jurisdiction, Hindi is the official language of communication for them. Therefore, the police have tie-ups with Hindi language newspapers. Most of the entries are anticipated to be text-based like poetries, stories, etc., which provides a future scope of improvement in this application. Implementing handwritten textrecognition functionality, particularly for the Hindi language, for the journalists using the web app, can make their work a lot easier and less time consuming. Through further development, the app can also be made available for devices running on other operating systems like iOS, Windows Mobile, and others.

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