

# SimplyCity - A Simple Mobile Crowdsourcing Platform for Emerging Cities

**Naveen Nandan**

Research & Innovation, SAP Asia  
SAP Innovation Center Network  
#14-01, CREATE Tower, 1 Create Way  
Singapore 138602

## Abstract

Using crowdsourcing and citizen science to perform specific tasks in cities has been extensively studied. In practice there still remains a wide gap in using such methods to collect essential hyper-local information in emerging cities. This paper introduces SimplyCity, a gamified task-based mobile crowdsourcing platform prototype that aims to help emerging cities collect useful hyper-local information by leveraging the knowledge of citizens.

## Introduction

Cities today are quickly making the move towards becoming smart cities. Smart cities are mostly attributed to the use of infrastructure such as sensors, high-speed networks, etc. and deploying technology platforms to enhance their operational efficiencies that in turn improve the lives of the city dwellers.

The first step almost every city takes in order to become a smart city is making city related data available to the public via digital platforms such as open data portals, mobile apps, etc. While modern cities have the capability and resources to digitize such public information, most emerging cities do not have the luxury of doing so.

Usually citizen knowledge is untapped for building smart city applications. By employing human computation and citizen science, hyper-local information from cities can be crowdsourced in a structured manner. Existing platforms discuss various methods for citizen participation<sup>1</sup>, distribution of tasks (Benouaret et al 2013; Kazemi and Shahabi 2012) and ensuring quality and validity of information.

Using *SimplyCity*, citizens can launch *campaigns* that can help collect simple yet essential hyper-local information about their city/neighborhood, for example, mapping a particular bus route and its schedule, opening times of various facilities and amenities, availability of goods in a neighborhood store, etc. to meet their daily information needs.

## The SimplyCity Concept

*SimplyCity* organizes information collection about the city in the form of *campaigns*. Each *campaign* is a collection of

several *tasks*, as shown in Table 1, has a duration for which it remains active and requires a minimum number of contributors to participate collectively in order to make the *campaign* successful. On completing each *task*, participants are awarded points which in turn add up to a leaderboard.

Task Category	Example Task
Location tagging	Calling all citizens from XYZ to help tag the GPS coordinates of nearby public bus stops
Picture	Help take a picture of the entrance of nearest clinics
Schedule	Until when is the convenience store near you open?
Rating	How do you like the idea of a community event next month?
Yes/No	Have you visited the new community center in your neighborhood?
Q & A	What cuisines are available at food courts around you?

Table 1: Task categories and examples from a city context.

*SimplyCity* segments its users broadly into two groups based on their roles:

**The Simple Campaigner** are citizens who want to obtain/gather collective useful information about their neighborhood/city with the help from other citizens and make it publicly available. In order to do so, they simply create and launch a *campaign* using a web application or create *tasks* via the mobile app. The *SimplyCity* platform helps to automatically target the *tasks* in a *campaign* to the most relevant users who are likely to contribute by completing the *tasks*.

**The Simple Contributor** are citizens who want to support a *campaign* by contributing information about their neighborhood/city based on their interests or prior knowledge. To be able to contribute, they make use of the mobile app to view *campaigns* and decide which ones to support. By supporting a *campaign*, the users are expected to complete relevant *tasks* associated with it.

In order to encourage collective participation, a competitive leaderboard is established at the individual level as well as the city/community level. As an individual continues to

Figure 1: Campaigns and Tasks as viewed on the mobile app.



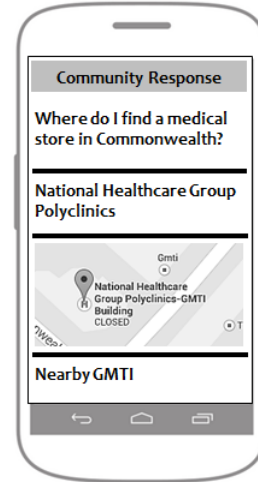
contribute through *SimplyCity*, it improves not only the individual's ranking but also the city/community ranking to which the user belongs to. Such gamified competitive participatory mechanisms have been studied widely in both human computation and crowdsourcing (Brabham 2012).

### Challenges

**Matching Tasks and Users** As highlighted in the previous section, the primary task of the *SimplyCity* platform is to match the tasks with the most probable users who would complete the tasks. One of the parameters that aids in this is the notion of users belonging to certain communities which they indicate when they register via the mobile app. Another method to deduce this is by observing the nature of tasks that the user completes over a period of time, which then calls for user behavior modeling using machine learning.

**Validation of Responses** As each task response is a human input, the validation of responses is quite crucial for maintaining data integrity. Automating the validation process can be explored using mechanisms such as majority selection, re-submission as tasks to other users, etc.

Figure 2: Example of semantic similarity of responses.



**Disambiguation** As highlighted in Figure 2, users may respond to the same task in multiple different ways, even though their response would be semantically similar and refer to the same real world entity. This tends to make the validation of responses more difficult.

### Future Work

As matching relevant tasks to users is a key component of the platform, immediate future work will focus on deploying the prototype in a real world setup to study user behavior and participation. In addition to the users of *SimplyCity*, we would also like to explore *groupsourcing* (Chamberlain 2014) and *friendsourcing* (Rzeszotarski and Morris 2014) via existing social networks as an additional channel to target tasks to a broader range of users.

**Acknowledgment** We would like to thank the Economic Development Board and the National Research Foundation of Singapore for partially funding this research.

### References

- Benouaret, K.; Valliyur-Ramalingam, R.; and Charoy, F. 2013. CrowdSC: Building Smart Cities with Large Scale Citizen Participation. *IEEE Internet Computing* 17(6):57.
- Kazemi, L.; and Shahabi, C. 2012. GeoCrowd: Enabling Query Answering with Spatial Crowdsourcing. In *Proceedings of 20th ACM SIGSPATIAL GIS*.
- Brabham, D. C. 2012. Motivations for participation in a crowdsourcing application to improve public engagement in transit planning. *Journal of Applied Communications Research* 40(3):307-328.
- Chamberlain, J. 2014. Groupsourcing: Distributed problem solving using social networks. In *Proceedings of HCOMP14*.
- Rzeszotarski, J. M., and Morris, M. R. 2014. Estimating the social costs of friendsourcing. In *Proceedings of the 32nd annual ACM conference on Human factors in computing systems*, 27352744. ACM.