



# SMART CITIES REQUIRE SMART CITIZENS: CROWDSOURCING, CO-CREATION, SELF-ORGANISATION

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Two years ago, the Caribbean were hit by a number of extremely powerful hurricanes. Hurricane Irma hit the island of Sint Maarten, a former Dutch colony. Immediately people in the Netherlands started initiatives in Facebook groups to collect food, clothing and flash lights to send to the people on Sint Maarten that lost their houses and lacked clean water. On national television people were encouraged to donate, but for a large group of citizens this was not enough. They wanted to do more. Facebook groups facilitated them to organize communities and call others to join in.

By empowering citizens and communities through digital technologies, governments can not only respond to crisis better or deliver better services in our cities, they also make citizens feel more engaged, more responsible and more in control. Best practices in this area cover a whole spectrum of ways for citizens to participate in and contribute to their cities: from a more passive involvement by simply installing a mobile app, by playing a simple game or by voting for a given option, to actively sharing information, measuring or investigating something or evaluating a government policy.

People often feel more at home in their cities when they can help or contribute. Governments are challenged to leverage this willingness and to channel the energy of their inhabitants into constructive and productive activities.

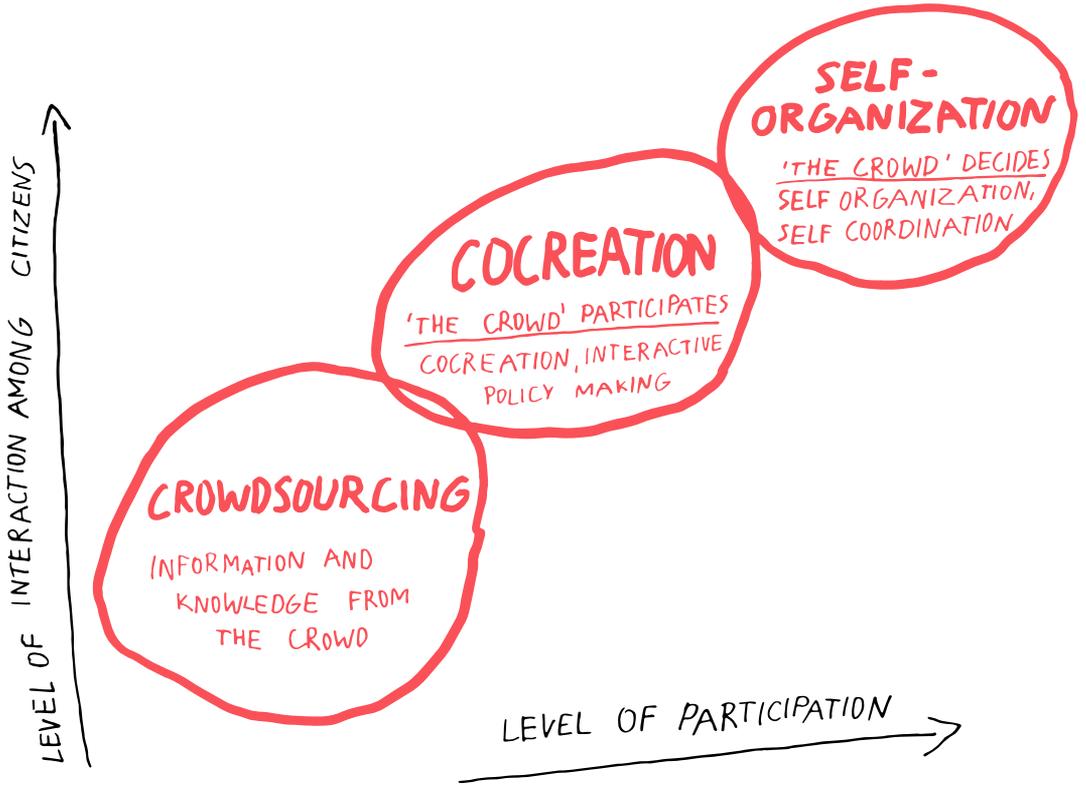
Digital information, data and communication tools together with blockchain and artificial intelligence allow for this collective intelligence to be collected. Many tools are already available that create collective intelligence by collecting and synthesizing individual contributions or by dividing large projects into smaller tasks and distributing these among a network of citizens. Unfortunately we see that most attention nowadays goes to smart city infrastructure projects, built and owned by tech

companies. Instead of supporting or empowering citizens the distance between them and their environment is widened. Citizens are monitored instead of engaged.

CROWDSOURCING,  
CO-CREATION AND  
SELF-ORGANIZATION

Source: author's  
personal archive

Next to the very important 'offline' placemaking digital technology offers great ways to engage people, give them control and help citizens organise themselves. In this article I will demonstrate how empowering these technologies can be and how cities can truly benefit from focussing on these, often simple and existing digitale technologies. Hereby I distinguish between three stages of participation: crowdsourcing, co-creation and self-organization.



## FIRST STAGE: CITIZENS AS THE SENSORS OF THE CITY

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### **CROWDSOURCING AND CROWDMAPPING**

One of the most important elements of crowdsourcing is that it enables to gather a lot of data on relatively low cost, or now cost at all. Instead of having inspectors check the air quality, the potholes in the streets, dangerous crossroads or broken lights it can now be done by ordinary citizens on their own phones. Where normally the frequency and width of inspections was a matter of financial and thereby often political priorities, with digital technology it is a low cost and potentially very efficient practice highly increasing the quality and service levels of the civic administration, with the help of its citizens. Citizens can measure everything that happens in the city by simply installing an app on a smartphone, by searching something on the web, by using a hashtag, by sharing the steps of their fitness tracker and by liking posts on social media. This type of technology a lot of communication and coordination among the citizens. Through the apps, websites of social media data is gathered, analysed and processed. [www.google.org/flutrends/about](http://www.google.org/flutrends/about)

Examples of how crowdsourcing and mapping empowers citizens and local authorities:

### **MEASURING EARTH VIBRATIONS IN A MINING AREA**

People living nearby the gas extraction sites in Groningen, the Netherlands, installed a smartphone app that measures vibrations by using the smartphone's sensors. The collective measurements provide an accurate insight in the number and scale of the earthquakes, which they then could use in discussions with government officials. Their data was as accurate as the official measurements, giving them equal footing at the discussion table. [bullet] measuring noise levels around the airport

Similarly, citizens living around Schiphol installed sensors (microphones) on their rooftops to measure the noise of airplanes when the airport announced new plans for growth. Through Sensornet, they could measure the noise levels constantly and 24 hours a day. The combined measurements of hundreds of sensors provide a detailed 3D map of the noise levels far more accurate than the measurements of the government and airport officials. This put an end to an ongoing debate between national government, local authorities and citizens who did not feel taken serious in the debate. [www.sensornet.nl](http://www.sensornet.nl)

### **MEASURING AIR QUALITY IN THE STREET**

The open source sensor on air quality, developed in the Smart Citizen project funded by the European Commission, allowed citizens to measure the air quality in their neighbourhood. This led to constructive and informed discussions between the citizens and the municipalities on fine dust concentrations from traffic and industries and policies to curb the emissions in all the neighbourhoods participating in this project. The measurements also made the citizens more aware about their own behavior and how they themselves contribute to the emissions in their neighbourhood. [www.smartcitizen.me](http://www.smartcitizen.me)

## **SECOND STAGE: CITIZENS REPORTING AND SOLVING PUZZLES**

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### **CO-CREATION**

Citizens can do more than take (passive) measurements. We see more and more examples of platforms enabling citizens to witness and report. In this way they are actively contributing and collaborating with NGOs, aid organisations and governments. Some of the platforms were developed in response to crisis situations, but have proven equally instrumental in more regular city activities. Examples of citizen reporting:

### **USHAHIDI, MAPPING IN AREAS LACKING BASIC OR TRUSTWORTHY INFRASTRUCTURES**

The open source platform Ushahidi has been used for mapping many large disasters such as the earthquakes in Haiti and Chili and fires in Russia, and also used to map the spread of diseases in certain areas. It was developed by local activists to monitor the elections in Kenya and report about the subsequent spread violence throughout the country. After Japan's tsunami in 2010 the platform helped to map the spread of radioactive radiation from the nuclear power plants that were damaged and leaking radiation. People were given sensors to measure the radiation and this was collected and visualized by Ushahidi on the map. Not only people living in the area or country where the disaster took place participated, people worldwide contributed. This provides a rich crisis mapping of an area that is hit by a disaster, such as a hurricane or earthquake.

Ushahidi combines low tech like sms, telephone calls, emails with smartphones, sensor data and data from official bodies such as governments, firemen, police and aid organizations (Red Cross). The maps give a real time situational awareness, enabling professionals to direct their aid or assistance to the most needed areas, and provide citizens with practical insights as where to find fresh water, shelter or medical assistance. The platform also gives leverage to citizens posting eye witness reports on local injustice, thereby also enabling them to built their cases and provide international organisations with the proper information to address the national authorities.

### **TOMNOD, IDENTIFYING AND CATEGORISING OBJECTS MASSIVE AMOUNTS OF IMAGES**

Similarly, people can also been asked to help out. Over the years people have helped to identify tumor tissue in large database samples, search for deforestation in jungle areas on googlemaps, or in the case of the missing Malaysian Airlines plane people all over the world were asked to help searchfor the plane on satellite images. The website Tomnod provides people with the satellite images and let's them indicate pictures with a possible wreckage part or ligt raft. More than thousand people participated in this endeavor. Unfortunately the plane still hasn't been found.

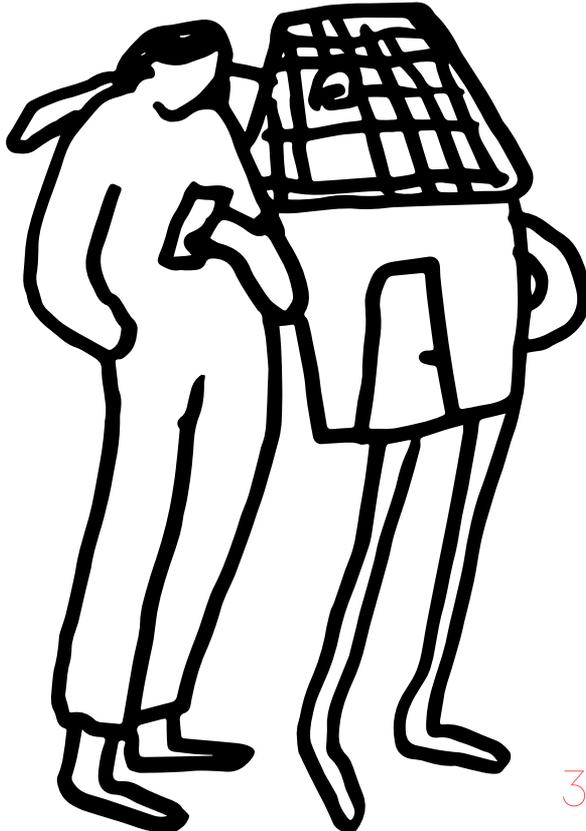
## **MYSOCIETY, ENABLING LOCAL CITY TOOLS**

Ofcourse, also without crisis situations, tools like the ones mentioned can prove very valuable in daily urban life. The last ten years the organization mySociety has developed a set of tools that allow people to be active citizens. The tools cover the social values transparency, community and democracy.

- Alaveteli makes it easy to run a freedom of information website.
- Fixmystreet is a tool that makes it easy to set up a website where citizens can report street issues to the authorities.
- EveryPolitician facilitates websites or apps that monitor elected representatives.

The open source platform is used by governments in many countries.  
[www.mysociety.org/](http://www.mysociety.org/)

There is a tremendous amount of experience with the use of these types of apps and data gathering sites throughout Europe, especially in the Scandinavian countries, the Netherlands and front runner cities like Barcelona. The technology is out there. It is just a matter of using it.



## THIRD STAGE: CITIZENS IN THE LEAD

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Instead of contributing to activities initiated by companies, governments or scientists, citizens can also take the initiative themselves: they create tools, develop products and provide services to each other. We refer to this third stage as self-organization.

### **DEVELOPING NEW IDEAS AND COLLECTIVE DECISION MAKING**

There are many tools available that let people work in groups and help them brainstorm for new ideas, selecting and evaluating them and making collective decisions. The city of Barcelona has built Decidim Barcelona (= 'We Decide' Barcelona) a website where citizens can participate and decide in topics related to the city.

Along these, digital platforms that facilitate collaboration among citizens, have fueled the rise of the so-called sharing economy. These platforms provide a marketplace where people can provide services, goods or money to each other. Many cities like Amsterdam, Barcelona, Berlin and Copenhagen have car and bike sharing and energy sharing initiatives that stimulate innovative mobility and make citizens more resilient.

In the agricultural field, there is an active communities of citizens and ProAms (professional amateurs) that work on biology, robotics and Internet of things for farming applications. It is makers movement around farming. This movement has helped to develop open source tools and affordable techniques that benefit scientists and farmers.  
[www.farmhack.org/tools](http://www.farmhack.org/tools)

## CONCLUSION

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Instead of striving for a smart city it might be better to built towards smart citizenship. Smart citizens can make smart decisions, resolve conflicts and take impactful actions. As we have seen they do not even have to actively participate, their smart phones can do the job for them and provide data that can lead to valuable insights.

1. [www.citysdk.eu](http://www.citysdk.eu)

The challenge for administrators is to facilitate citizens to contribute in different ways and with different intensities. It is not a matter of simply outsourcing tasks to citizens.

Projects like The City SDK<sup>1</sup> project have shown that it is possible to create a fully-fledged platform with which citizens and businesses can develop applications and services for the city. The platform ensures that the various technologies and data, such as mobility, energy and buildings, are integrated with each other. This is an alternative to the offerings of commercial providers but its principles could also be incorporated more into the commercial smart cities using more open source software and applications.

By working together with citizens, citizens are not only much more activated, they feel involved, their knowledge is used, their energy and willingness to help deployed positively. Moreover, by giving back information they become wiser.

Active committed citizens are desperately needed in times of major transitions, such as the energy transition. This transition that can only succeed if citizens play an active role and change their behavior. The growing popularity of solar panels on the roofs of houses is a good example of small contributions that citizens make on an ever-increasing scale. Collective street buys and other community initiatives contributed to the fact that now 1 in 8 houses in the Netherlands is equipped with solar panels.

So, let us not complain about the increasing power of tech companies such as Google, Facebook, Microsoft and Amazon, but ensure that the operating systems of the cities of the future are in the hands of citizens and administrators. Let's have smart citizens make our cities smart.

## REFERENCES

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