



## official data

Official data can include longitudinal survey data, such as census data, electoral registers or other population data. Official data provide a long-term picture of a country over time, and are usually collected by public institutions or national statistical agencies as a public good.



### CASE STUDY: AFRICAPOLIS

Africapolis aims to be the most comprehensive and standardised geospatial database on cities and urbanisation dynamics in Africa. It blends data from across the continent in an effort to provide standardised, comparable insights into Africa's fast-changing urban populations.

The single most important element is official population records, including census data of official cartographic resources such as administrative boundaries. In some cases official data can date back 30 or more years, which is significant given the pace of demographic and urban trends. Africapolis brings these datasets together into a single, comparable resource, as well as additional sources such as satellite data to confirm the precise location of settlements. By integrating thousands of smaller agglomerations (covering inhabitants of a total of 180 million people) Africapolis also highlights the role of smaller towns and cities in urban networks, the emergence of new urban areas and the increasing fluidity between urban and rural environments.



## citizen-generated data

Citizen-generated data is a broad category that includes any information that can be collected from people either by active involvement (experiences, ideas, upvotes) or passively (e.g. wearables or transactions data).



### CASE STUDY: I PAID A BRIBE

I Paid A Bribe attempts to tackle corruption in India and other countries by tracking bribe payment activity and raising awareness about the nature and spread of bribe-related exchanges. The platform crowdsources anonymous reports by people who have either paid a bribe, refused to pay a bribe or who met an officer who did not ask or pay a bribe. The crowdsourced reports feed into city, state and country-level databases of corruption in public services. The Indian website of I Paid A Bribe receives around 25 to 50 reports per day, with many stories of official investigations leading to suspension of officials involved. The project has now partnered with 25 other countries who have replicated the site.



## satellite data

Satellite data is aerial imagery collected by satellites, usually available from companies for a fee. It can provide detailed insights into land-use over time, or act as a proxy for other measures.

### CASE STUDY: REGEN NETWORK

Regen Network collects ecological and agricultural data via remote sensing (images collected by satellites, drones, and planes), and on-the-ground observation via Internet of Things (IoT) sensors. The collected data is verified by farmers and then run through a trained machine learning model which tries to determine ecosystem health. So far, Regen Network have developed an algorithm that is capable of detecting till events in Romania and Ukraine with a 99 per cent accuracy through public satellite data.



STAGE: B2  
GATHER DATA,  
INFORMATION, IDEAS



## sensor data

Sensor data includes information collected by physical sensors recording actions and physical changes (e.g. traffic cameras, weather sensors, ambient sensors, wearables or drones). Sensor data can provide cheap, real-time measurements of anything from pollution to crop-yield.

### CASE STUDY: ARRAY OF THINGS

Data is starting to play a role in helping cities understand and manage air quality. To try and tackle this, Chicago has begun an ambitious effort called Array of Things, to install a network of approximately 100 air quality and weather sensors around the city, and make this data available for open use for researchers and educational purposes. The sensors collect real-time data about their surroundings, including air quality, climate and noise, with added privacy controls to ensure no individual data is collected. The aim is to provide real-time detection of urban flooding, high-resolution 'block-by-block' weather and climate information, and better understand population flows to improve urban planning.



STAGE: B2  
GATHER DATA,  
INFORMATION, IDEAS



## open data

Open data is the raw data that is gathered by people or organisations, published in an electronic format that machines can read; it is then shared online and allowed to be re-used by others instead of keeping it private.

### CASE STUDY: OPENCORPORATES

OpenCorporates increases transparency in the corporate world through making information about companies more accessible, so that citizens and journalists can better monitor and regulate them. OpenCorporates crowdsources data from citizens, who contribute to populating and updating the platform, identifying errors, or importing web scraped data. The contributions from people all over the world and their local knowledge have made OpenCorporates the largest open database of company data in the world, with over 100 million companies in a large number of jurisdictions. The fact that the data is open has also improved data quality, allowing anomalies, errors and issues to be discovered faster.



STAGE: B2  
GATHER DATA,  
INFORMATION, IDEAS



## social media data

Social media data is information generated by activity on platforms such as Twitter, Facebook, Github, Meetup or other social networking sites. It can be accessed via APIs or scraped, providing real-time insights into human behaviour or social trends.

### CASE STUDY: PETABENCANA.ID

PetaBencana.id, is a project that combines data from hydraulic sensors with citizen reports over social media including via Twitter, to produce a flood map for cities in Indonesia. The system is programmed to react when someone in Jakarta tweets the word "banjir" (flood) and tags @PetaJkt. PetaBencana.id automatically replies, and asks them to confirm the tweet with geotagged photos. The platform then combines all incoming reports with official data from the city government to build up-to-the-minute, online flood maps, which are then made publicly available. Through producing real-time maps of urban flooding, PetaBencana.id represents a major advance on previous static PDF maps.



STAGE: B2  
GATHER DATA,  
INFORMATION, IDEAS



# ethnographic data

Ethnographic data encompasses qualitative information (stories, personal accounts or transcripts) collected by interviews, participant observation, note-taking, online text or recording. It provides rich and highly detailed accounts of people's lives.



STAGE: B2  
GATHER DATA,  
INFORMATION, IDEAS

CASE STUDY: ON OUR RADAR

On Our Radar trained citizen journalists to provide detailed accounts of the Ebola crisis from communities all around Sierra Leone (e.g. from urban slums, polio camps, and remote rural villages). The reporters shared their reports with On Our Radar via recorded telephone interviews, WhatsApp audio and photo functions, and SMS. People in the poorest regions of Sierra Leone are more likely to have a mobile phone than access to basic amenities and electricity, so even those in the most remote regions could report.

On Our Radar reports captured the atmosphere of day-to-day life in vulnerable communities in Sierra Leone, often delivering breaking news that international media did not otherwise have access to, and from communities that Western journalists failed to reach. Its reports were featured on the BBC World Service, Guardian and Sky News among others.



# web-scraped data

Web-scraping is a method for extracting unstructured data from across the web, such as company websites, social media or job advertisements. Where official datasets are costly to gather and updated infrequently, web-scraping can provide more timely insights into social or economic trends.



STAGE: B2  
GATHER DATA,  
INFORMATION, IDEAS

CASE STUDY: HEALTHMAP

HealthMap is a platform that brings together a range of disparate and informal online sources to monitor the outbreak of diseases. By scraping data from across the web, the platform is able to provide near real-time intelligence on a broad range of emerging infectious diseases. The website and app bring together data from news aggregators such as Google and Baidu News, as well social media data and validated official reports. The system then organises, integrates and visualizes potential threats. The platform was successfully used for tracking cholera in Haiti after the 2010 earthquake.



# call detail records

Call detail records (CDRs) can be obtained as anonymous data from telecoms companies, providing fine-grained information into mobility or population trends.

### CASE STUDY: NCELL NEPAL

In April 2015, an earthquake struck Nepal impacting millions across the country. NCELL, Nepal's largest mobile phone operator, agreed to share anonymised mobile phone data with the non-profit Swedish organisation Flowminder. Population movement estimates were calculated by combining de-identified data on people's movements with available population data, and by comparing SIM card movements before and after the earthquake to normal pre-earthquake movements. By gaining real-time insights into population flows, UN agencies and government were able to better target aid to affected communities, saving hundreds of lives.



STAGE: B2  
GATHER DATA,  
INFORMATION, IDEAS



# other data?

What other data sets might be particularly relevant or interesting?



STAGE: B2  
GATHER DATA,  
INFORMATION, IDEAS



# DECK: GATHER DATA METHOD CARDS

STAGE: B3  
GATHER DATA,  
INFORMATION, IDEAS

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## open API

Application Programming Interfaces (APIs) provide the standards by which data is accessed and transferred between websites. Open APIs encourage collaboration and are built using open standards, allowing them to be freely accessed and used.



STAGE: B3  
GATHER DATA,  
INFORMATION, IDEAS

DECK: GATHER DATA  
METHOD CARDS

OPEN API

### CASE STUDY: OPENAHJO

City Councils make hundreds of decisions every month, and it can be hard for both citizens and civil servants to follow the progress of legislation making its way through government. Open Decisions is Helsinki City Council's attempt to standardise and publish all of its decision making data electronically. Data about meetings, agendas and decisions from all across the council are tagged according to the Popolo open government standard, and then made available via an open API called OpenAhjo. By publishing the data via an open API, a range of developers have been able to create digital applications that notify local residents when decisions are made on topics of interest. It has also been used by city employees to more easily search and track progress made by local politicians.

## crowdsourcing

Crowdsourcing is an umbrella term for a variety of approaches that source data, information, opinions or ideas from large crowds of people, often by issuing open calls for contribution. It can help bring new ideas to light that hadn't previously been considered, or to gather expertise from people who have specialised knowledge or understanding of an issue.

### CASE STUDY: DECIDE MADRID

The City Council of Madrid has used CONSUL, an open software tool, to create a citizen platform - Decide Madrid - to crowdsource citizen proposals and harness more local knowledge in decisions about how to plan and allocate budgets. New ideas from residents have been gathered and implemented on topics ranging from sustainability and air pollution, to ticketing for local transport. Since its creation it has allocated over 100 million Euros in funding for projects suggested by local people. On the platform, people can make proposals, engage in debates, and vote for ideas. It is often used in conjunction with offline engagement.



STAGE: B3  
GATHER DATA,  
INFORMATION, IDEAS



## microsurvey

Microsurveys are a short, abbreviated form of surveying which typically take the respondent only a few minutes to complete. Microsurveys are often delivered by mobile phone, text message or a digital platform. Benefits include a much faster turnaround, and higher frequency of results, compared to traditional surveys.

### CASE STUDY: SAUTI ZA WANANCHI

Traditional, large-scale household surveys tend to be costly, and can take over a year to produce. Sauti za Wananchi ('Voices of citizens') provides an alternative whereby mobile phones are used to collect information from a broad cross-section of citizens in Tanzania and Kenya.

For each survey 2,000 'panel members' are randomly selected from regions across the country, and sent mobile phones and solar-powered phone chargers to ensure that no-one is excluded. They are called and interviewed from a call centre in Nairobi once a month, with questions on a different topic each time. So far, Sauti za Wananchi has been used to gather insights into local people's living standards, perceptions of poverty and to understand people's access to safe drinking water. It claims to be Africa's first nationally representative mobile phone survey.



STAGE: B3  
GATHER DATA,  
INFORMATION, IDEAS





## challenge prize

Challenge prizes or competition platforms are a method of drastically widening the pool of possible solutions to solve a problem. They are useful for getting a variety of responses to questions and of spurring novel suggestions for how to address an issue or specific challenge.

**CASE STUDY: DARPA GRAND CHALLENGE**  
In the US, the Defense Advanced Research Projects Agency (DARPA) ran a grand challenge with the goal of supporting innovation to accelerate the development of autonomous vehicle technologies with military applications. No vehicles completed the set route for the \$1 million prize in 2004, but a year later another round was held in the desert near the California/Nevada state line. A total of five teams completed the course which was 132 miles over the desert terrain. The Stanford Racing team took home the \$2 million prize, completing the course in 6 hours 53 minutes. DARPA credits this challenge with the creation of 'a mindset and research community that a decade later would render fleets of autonomous cars and other ground vehicles a near certainty for the first quarter of the 21st century'.



## crowdmapping

Crowdmapping is a type of crowdsourcing which gathers data from different sources, including social media, text messages or geographic data, to provide real-time, interactive information about issues on the ground. Crowdmapping can create detailed almost real-time data in a way that a top-down, centrally curated, map may struggle to replicate.

**CASE STUDY: SYRIA TRACKER CRISIS MAP**  
Crowdmapping first came to international attention through its successful use in the global disaster relief movement. One example is the Syria Tracker Crisis Map, which has been used to crowdsource citizen reports on human rights violations since the beginning of the Syrian conflict in 2011. The map attempts to provide more detailed metrics on fatalities, while preserving the name, location and details of each victim. The service blends reports from local news with on-the-ground reports, using hashtags on social media or sent via email. Nearly 5,000 submissions, including over 11,000 fatalities, have been reported since the map's launch, with collected data being used by both USAID and the Washington Post to report on local events.



# gamification (serious games)

Gamification is a broad term that refers to using game-like elements to make engagement in collective intelligence projects more fun. It can be a useful way to motivate audiences in complex topics or research, as well as illustrating trade-offs associated with making certain choices. Games can also be useful for presenting data, ideas and trends.



STAGE: B3  
GATHER DATA,  
INFORMATION, IDEAS

### CASE STUDY: SEA HERO QUEST

Sea Hero Quest is a mobile game where players' actions help scientists to understand and fight dementia. The game asks users to find their way through a digital maze, in turn providing researchers with valuable data to understand the user's spatial navigation. According to its website, playing Sea Hero Quest for only two minutes generates the same amount of data that it would take 5 hours to collect in similar lab based research. As a result the project has gathered approximately 17,600 years worth of dementia research from players on the app (from around 4.3 million players). Initial results from the data have provided novel insights into spatial navigation abilities across different social groups, ages and countries.



# citizen science

Citizen science is any process where scientists and (usually unpaid) volunteers work together to collect or process scientific data or observations. Citizen science unlocks new resources for research, experimentation and analysis by opening the process to everyone.



STAGE: B3  
GATHER DATA,  
INFORMATION, IDEAS

### CASE STUDY: MOSQUITO ALERT

The World Health Organisation reports over 500 million cases of mosquito borne illnesses a year, but the global spread of disease is difficult to manage or track in real-time. The Global Mosquito Alert Consortium (GMAC) was established in 2017 as a global network of citizen science projects that follow a common set of four protocols to track breeding sites, bites and sightings of mosquito species known to carry diseases. One such initiative includes Mosquito Alert, a project based in Spain that works with local communities and schools to build capacity for citizen science. It provides an app for volunteers to submit pictures of mosquitos or local breeding sites. These are then validated by a team of experts, and presented on an interactive map. Since 2014, the platform has been downloaded 57,000 times, reporting over 12,000 observations of tiger mosquitoes and 3,117 breeding sites.



## participatory sensing

Participatory sensing is where citizens use lightweight, cheap sensors to collectively monitor the environment around them. It also includes the task of collectively sharing and interpreting streams of citizen-sensed data with other community members, deepening their understanding of the issue, educating participants and empowering them to act.



STAGE: B3  
GATHER DATA,  
INFORMATION, IDEAS

**CASE STUDY: IDEAS FOR CHANGE**  
Noise pollution is a problem which affects many people living in inner city Barcelona. A think tank called Ideas for Change worked with local communities to help them install sensors that measure the harmful effects of noise pollution in their neighbourhood. Participants were provided with cheap, open-hardware sensors, and then guided through the process of setting-up the technology and sharing data with one another.

The council organised public meetings in which locals could talk through their findings and propose potential solutions. Some of the solutions that have been implemented include new flower beds that remove areas where people used to sit and drink into the late hours of the evening, and improved community policing.



## data collaborative

Data collaboratives are a form of collaboration in which partners from different sectors - including private companies, research institutions, and government agencies - enter into an agreement to exchange data for a specific social cause. Data collaboratives aim to unlock new value in private data that would not be exploited otherwise.



STAGE: B3  
GATHER DATA,  
INFORMATION, IDEAS

**CASE STUDY: UN GLOBAL PULSE**  
In recent years the Mexican state of Tabasco has experienced record-breaking rainfall, yet timely data about how floods are affecting the population in real-time is currently missing. In response, UN Global Pulse brought together a range of novel datasets to generate real-time insights about human behaviour during flooding events. Data sharing and analysis was made possible via a public-private partnership between Telefonica Research and data scientists from the Technical University of Madrid, under guidance from experts at Global Pulse and the World Food Programme. By combining citizen mobile phone data, remote sensing data (satellite images), rainfall data, and census data from citizens, the project was able to use patterns of mobile phone activity to highlight the impacts of flooding on infrastructure and the local population, whilst also helping to target and improve public communications for disaster response.



# petition platform

Petitions are collections of signatures, either online or offline, that aim to raise awareness by mobilising as many people around an issue as possible.

CASE STUDY: MEXICO CITY CROWDSOURCED CONSTITUTION

To solicit ideas for a new city-wide constitution, Mexico City Government partnered with an online petition platform (Change.org) to gather suggestions from citizens. The owner of any petition gaining 10,000 signatures or more was given the chance to present to a 28-person drafting committee, made up of Mexico City residents. By the end of the process the city had collected 280,000 signatures on 357 petitions, on issues including LGBTI rights, river and lake revitalization and universal internet access; many of which went on to inform the final document.



# solution mapping

Solution mapping is a method that helps organisations and the communities they work with to identify needs, issues and opportunities by looking for solutions developed by people in response to concrete problems they face.

CASE STUDY: HONEY BEE NETWORK

In many regions across the world there is tremendous potential for development through building upon what people already know and their capacity to learn from one another. The Honey Bee Network, based in India, aims to pool local solutions and facilitate communication among farmers, artisans, pastoralists and other grassroots innovators all over the world.

One of the network's methods for gathering solutions involves 'innovation scouting', where university students are asked to survey local villages for local innovations during their summer holidays. The network has built what is now one of the largest databases in the world on farmers' innovations. It is designed to be easy for local communities to use, and provides multiple translations in local languages. A key principle of the platform is that knowledge holders must benefit from the success of their innovations, in both fame and remuneration.



# wikisurveys

Wikisurveys are a type of survey where participants can add statements that others respond to. Participants' statements are added to a pool, and are then randomly presented back for individual participants to respond to or rank. Over time, participants generate new ideas and build a picture of where consensus or disagreement lies.

CASE STUDY: ALL OUR IDEAS IN NYC  
In 2011, New York City Mayor's Office of Long-Term Planning and Sustainability ran a Wikisurvey, where top-voted ideas were integrated into the city's PlaNYC 2030 Sustainability Plan. To do this they worked with a platform called All Our Ideas, which uses 'pairwise comparison' as a method of asking crowds to quickly sort and filter one another's proposals. Over four months around 1,400 respondents provided nearly 32,000 votes and 464 new ideas, many of which the council had previously not considered.



STAGE: B3  
GATHER DATA,  
INFORMATION, IDEAS



# DECK: PEOPLE CARDS

STAGE: C2  
MOBILISE PEOPLE

# citizens

Members of the public



STAGE: C2  
MOBILISE PEOPLE



# policy makers

Government and regulators



STAGE: C2  
MOBILISE PEOPLE



# experts

Academics or experienced practitioners



STAGE: C2  
MOBILISE PEOPLE



# entrepreneurs

Individuals or small and medium sized enterprises



STAGE: C2  
MOBILISE PEOPLE



# corporate partners

For-profit organisations



STAGE:  C2  
MOBILISE PEOPLE



# central government officials

Civil servants and officials



STAGE:  C2  
MOBILISE PEOPLE





# local government officials

Councillors and administrators



STAGE: MOBILISE PEOPLE  C2



# non government organisations

Charities and not-for-profit organisations



STAGE: MOBILISE PEOPLE  C2



# volunteers

Everyday people who want to help



STAGE:  C2  
MOBILISE PEOPLE



# local community

People within the neighbourhood



STAGE:  C2  
MOBILISE PEOPLE



# media and press

Journalists and influencers



STAGE: C2  
MOBILISE PEOPLE



# investors

Funders or shareholders



STAGE: C2  
MOBILISE PEOPLE



# customers

People who might want a product or service



STAGE: MOBILISE PEOPLE  C2



# employees

People who work directly with or for you



STAGE: MOBILISE PEOPLE  C2



# suppliers

People who provide a product or a service



STAGE: MOBILISE PEOPLE



# professionals

Doctors, nurses, lawyers, teachers, police, armed forces etc.



STAGE: MOBILISE PEOPLE



# young people

Children or teenagers



STAGE:  C2  
MOBILISE PEOPLE



# retired people

Older people who may have retired



STAGE:  C2  
MOBILISE PEOPLE



# brokers

Lawyers, bankers, consultants, intermediaries, agents, etc



STAGE: MOBILISE PEOPLE  C2



# other?

Who else might be particularly relevant or interesting?



STAGE: MOBILISE PEOPLE  C2



# DECK: CONNECT METHOD CARDS

STAGE:  
CONNECT & INTERPRET



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## deliberation

Deliberation is a method of weighing up different options through dialogue. It can typically be used for engaging members of the public or participants in considering trade-offs, and in establishing greater understanding of one another's views to arrive at more consensus-driven and informed set of solutions or recommendations.



STAGE:  
CONNECT & INTERPRET



DECK: **CONNECT  
METHOD CARDS**

DELIBERATION

### CASE STUDY: ESTONIAN PEOPLE'S ASSEMBLY

In 2012 the ruling Reform Party in Estonia was beset by a scandal related to anonymous donations, which sparked a national engagement exercise. The five-stage process began with crowdsourcing of over 2,000 proposals on an online platform, on topics from reducing barriers to creation of political parties, to improving party conduct. The process then culminated in a face-to-face deliberation between randomly selected citizens. Over several days, the group was tasked with sorting through the online proposals, and making practical recommendations to the Parliament. Fifteen proposals were submitted, leading to three new items of legislation and another four proposals being partially adopted.





## data collaborative

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## collaborative platform

A collaborative platform enables a loosely defined group of participants to come together to create a product or service, which is typically then made available to contributors or non-contributors alike. It draws on principles of open collaboration and open source software development, whereby openness and transparency in product development improve participation, trust and collective memory.

### CASE STUDY: WIKIFACTORY

Wikifactory is an open platform that allows product designers and creators to collaboratively solve problems using digital fabrication technologies. It responds to a problem among product designers where sharing PDFs and different file types over email, or via a shared drive, hinders effective collaboration. The platform provides something similar to Github for product designers, including version-control, an issue and documentation tracker to crowdsource ideas or solutions, a permission system and community tools to aid collaboration. By opening up the process of product design, Wikifactory also makes it possible to invite collaboration on designs from creators all over the world, who may copy, use or replicate the designs. Many projects currently on the site aim to provide cheap solutions for solving social problems using digital fabrication, from small wind turbines to water filtration systems for clean water. So far over 3,000 product developers from around the world have signed up to the platform.



## project wikis

A project wiki is a collaborative web page which anyone can access, change or edit. Project wikis are structured to enable multiple people to collaborate, share knowledge and improve on one another's work all in one place.

### CASE STUDY: PUBLIC LAB

Public lab is an open community for citizen scientists, whose aim is to empower communities facing environmental justice issues to own the data and advocate for the change they want to see. Public Lab use project wikis to collect information, documentation and instructions on citizen science projects. These range from guides on how to build your own spectrometer to introductions to near-infrared photography. Due to their open nature, the community is able to iterate and improve on project wikis over time or as new information becomes available. Some of the most active pages have been edited and updated by the community over 700 times.



## open source repository

An open source repository is a digital repository where content (e.g. code, text or other learning resources) can be stored and freely downloaded with few restrictions on use. Many open source repositories help aid collaboration by providing a space for uploading documentation, monitoring and version control.

### CASE STUDY: GITHUB

Software projects can be complex and often require contributions among a wide variety of developers and teams. Github is a platform for enabling collaborative, non-linear working with open source files. The platform is built on top of the 'Git' distributed version control system whereby every user contributing to a project holds a version of the project's content (a 'repository') which they can edit, add to and test. When they are satisfied with their edits they can 'commit' them, and the system exchanges sets of changes, synchronising everyone's latest work.

GitHub hosts these repositories and adds a user interface and tools that help with coordinating work. The platform makes detailed statistics of users' work open to inspection by default. Github reports having over 30 millions users and 100 million repositories, making it the largest host of source code in the world.



## community of practice

A community of practice is a group who share a concern and learn by interacting with one another regularly. In pursuing their practice area, participants help each other, and build up a repertoire of shared resources (experiences, tools and solutions) while working together.

### CASE STUDY: STATES OF CHANGE

States of Change is a global community of practice whose aim is to build the culture and capability of governments to deal with the problems they face, and strengthen shared knowledge about public innovation.

States of Change runs learning workshops and collaborative R&D projects with governments around the world to explore and test what works. Since its creation States of Change has worked directly with over 150 public servants, including from national and regional governments in the UK, Australia, Canada and Latin America. An evaluation of the programme highlighted how its focus on in-practice learning helped participants gain greater confidence in applying and spreading innovation.



## data warehouse

A data warehouse is a central database optimised to analyse information coming from a range of different sources. Data is cleaned, organised and structured in advance, acting as a single source for querying and enabling faster decisions.

### CASE STUDY: THE NEW YORK CITY FIRE DEPARTMENT

The New York City Fire Department (FDNY) uses a Risk-Based Inspection System in order to better understand buildings that are most vulnerable to fire across the city. Collecting data from building inspections was previously done by paper, making it prone to delays and difficult to share information across the city's various fire companies, battalions and divisions. Therefore the department has built a data warehouse that all internal partners can access. This has helped to streamline the FDNY's entire inspection workflow, allowing statistics from the inspections to be gathered in one place, and improving measurement against internal goals.



## participatory monitoring

Participatory monitoring is the regular collection of measurements undertaken by local residents or members of a community. The aim is to provide high-quality information and raise awareness about local issues.

### CASE STUDY: SEEDS FOR NEEDS

As the climate changes and becomes more difficult to manage, farmers around the world need to be able to adapt, including access to a wide range of crop seeds.

Through the Seeds for Needs initiative, farmers test and evaluate different varieties of seeds in their own farm's conditions, using an online platform. Scientists then link farmers' feedback with agro-climatic and soil data, and feed information back to farmers about which varieties are best adapted to local climates. As a result of participatory monitoring trials, in 2017 the Ethiopian government approved two new wheat varieties for distribution as officially approved seeds.

The project now involves around 45,000 farmers around the world.



## online forums

Online forums are platforms that allow people to share ideas and resources, to deliberate on key issues or simply to talk to one another. They may be used by policymakers to generate discussion or suggestions on a bill or document, or they may be set up by projects or companies trying to build and sustain a community.

Most successful forums involve active and ongoing moderation.

### CASE STUDY: SMARTPARTICIPATION

SmartParticipation is an open source e-participation platform designed to offer an adaptable online forum environment for informed discussion and ideation.

The design was informed by experiments run by researchers at the University of Cornell in partnership with several government agencies in the US. The platform itself provides easy content authoring, targeted commenting and options for moderating discussions.

One of the many experiments run on the platform was a 2011 consultation on Airline Passenger Rights in partnership with the Department of Transportation (DOT). More than 19,000 visitors posted over 900 comments on a proposal that would give airline passengers increased protections. After the comments were summarised and sent to the department, DOT announced that they played an important part in shaping the final rules.



## what works centres

What Works Centres aim to ensure that public spending and practice is informed by the best available evidence. Centres operate in their own distinct way, but all aim to generate evidence and translate it into relevant and actionable guidance.

### CASE STUDY: THE EDUCATION ENDOWMENT FOUNDATION (EEF)

The EEF is an independent charity dedicated to breaking the link between family income and educational achievement, by gathering research evidence and making it actionable to teachers and practitioners across the UK. EEF's Teaching Learning Toolkit is an accessible and interactive web tool that summarizes research evidence for teachers and schools on how to improve the attainment of disadvantaged people, according to cost, evidence and impact. More than half of secondary school leaders in the UK now say they use this resource.



## study circle

Study circles are groups that meet regularly with an aim to develop collective social expertise, and to brainstorm solutions or ideas. They try to incorporate diverse perspectives and encourage people to respectfully consider the views and values of other members within a community.

### CASE STUDY: RESILIENCE DIALOGUES

The Resilience Dialogues were a set of facilitated discussions in the US designed to help communities create climate action plans. The service uses an online platform, developed by the Massachusetts' Institute for Technology's Climate CoLab. Ideas from communities are matched with expert knowhow, and online discussions are used to clarify local risks and opportunities, share strategies that have worked in other communities, and build shared commitment to future plans and actions.

Local knowledge, combined with prompts from experts about the resources needed for various ideas and the likely outcome of particular proposals lead to much more robust proposals than either of these groups could have produced in isolation. Communities leave the dialogues with more confidence, as well as a range of new resources and a strategy for implementing resilience efforts in their local context.



## peer-to-peer exchange

Peer-to-peer exchange refers to the process of sharing information horizontally to build and maintain a community, to collect data, connect people or send alerts about an event or emergency. Platforms for this vary, ranging from messaging platforms to online forums. Some rely on the internet but others do not (e.g. SMS or mesh networks).

### CASE STUDY: WEFARM

Wefarm is a free peer-to-peer service that enables small-scale farmers in Kenya, Uganda, and Tanzania to share information via SMS, without the internet and without having to leave their farm. Wefarm's network allows small-scale farmers to ask each other questions on anything related to agriculture and then receive crowdsourced bespoke content and ideas from other farmers around the world within minutes. The questions can be asked in any language and messaging is free of charge.

Knowledge shared on Wefarm can help farmers produce higher quality products, increase yields, gain insight into pricing, tackle the effects of climate change, diversify agricultural interests, and source the best seeds, fertilisers, and loans.



## hackathon

A hackathon is a challenge-based event where the organiser defines a problem or challenge, and participants compete to create a solution. Sometimes this involves a reward. Hackathons bring people together to help surface new ideas or solve a problem quicker.

### CASE STUDY: TAIWAN PRESIDENTIAL HACKATHON

In 2018, the Taiwanese government launched the Taiwan Presidential Hackathon to demonstrate its commitment to open source and open data, and to accelerate solutions that address the needs of the country by inviting social innovators to propose project ideas using data and technology.

The government provided participating teams with open government datasets, as well as some 'protected' data that can be made accessible upon request. Submissions were judged based on criteria: innovation, social influence and feasibility. In 2019 ten finalists were selected from over 100 submissions, with solutions ranging from predictive monitoring of water leakages to a platform for improved knowledge sharing among caregivers. The government has now introduced an international track that invites submissions from all over the world.



# DECK: INTERPRET METHOD CARDS

STAGE:  
CONNECT & INTERPRET



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## proxy indicator analysis

In statistics, a proxy is a variable that is not directly relevant, but can serve in place of an unobservable or measurable variable. Proxy indicator analysis is useful for inferring a measurement for unavailable data based on known correlated information.



STAGE:  
CONNECT & INTERPRET



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METHOD CARDS

PROXY INDICATOR ANALYSIS

### CASE STUDY: UNDP SUDAN

The UNDP office in Sudan tested the use of satellite data for estimating poverty levels via changing night-time energy consumption. The team used data pulled from night-time satellite imagery and analysed these illumination values over a two-year period, in conjunction with electric power consumption data provided by the national electricity authority. The proof-of-concept showed that night-time satellite imagery provided a reasonable proxy for poverty, though more detailed analysis with higher spatial and temporal resolution would have provided a better result. The experiment demonstrated the feasibility of using satellite imagery and machine learning to understand poverty, which a number of other organisations have continued to explore.

# natural language processing (nlp)

Natural language processing (NLP) allows computers to understand, interpret and extract key information from human language. NLP techniques can be used to carry out automated analyses of different media to better understand which issues matter to people and what they are saying about key issues.



CASE STUDY: UGANDA RADIO CONTENT ANALYSIS

In Uganda, calling into a talk show on radio to share thoughts, opinions and reports is a common practice, especially in rural areas. Pulse Lab Kampala and the UNDOCO developed a technology prototype that allows analysis of public discourse on radio, understanding trends or issues that matter to communities in real-time. The Radio Content Analysis Tool transforms discussions taking place on radio into big data text, which is then mined for topics of interest.

For instance, filters to detect conversations regarding refugees were created and a translation team annotated all mentions of refugees, including issues of acceptance, health or increasing social tensions. The study demonstrated that speech-to-text processing, combined with NLP, can provide insights on early warning mechanisms, can help to monitor the implementation of projects and programmes, and can support programme evaluation.



# predictive analytics

Predictive analytics encompasses a variety of statistical techniques that analyse current and historical facts to make predictions about future or otherwise unknown events. It can be used to identify early warning signs or to predict likely outcomes based on a range of variables.



CASE STUDY: AIME

Artificial Intelligence in Medical Epidemiology (AIME) is an initiative that uses data from a variety of different sources to predict disease outbreaks, providing warnings before the spread of disease occurs. The system relies on an algorithm that blends over 20 different variables from local government data and satellite data, with variables such as weather, wind speed and direction to rainfall. The result of this analysis is a map which illustrates the probability and location of the next outbreak. Following initial tests in Malaysia, Brazil and other South American countries, AIME's successes include an algorithm that can predict the location of the next Dengue, Zika or Chikungunya outbreak up to three months in advance with over 86 per cent accuracy.





## deliberation

Deliberation is a method of weighing up different options through dialogue. It can typically be used for engaging people in making trade-offs, and in establishing greater understanding of one another's views to establish consensus. Sometimes stratified sampling can be used to select a representative sample of participants (so-called 'mini-publics').

**CASE STUDY: ESTONIAN PEOPLE'S ASSEMBLY**  
In 2012 the ruling Reform Party in Estonia was beset by a scandal related to anonymous donations, which sparked a national engagement exercise. The five-stage process began with crowdsourcing of over 2,000 proposals on an online platform, on topics from reducing barriers to creation of political parties, to improving party conduct. The process then culminated in a face-to-face deliberation between randomly selected citizens. Over several days, the group was tasked with sorting through the online proposals, and making practical recommendations to the Parliament. Fifteen proposals were submitted, leading to three new items of legislation and another four proposals being partially adopted.



## crowd forecasting

Crowd forecasting is a method that asks small or large groups to make predictions about the future. It is inspired by research which showed that small crowds of non-experts can often forecast political events more successfully than individual experts.

**CASE STUDY: EARLY WARNING PROJECT**  
Genocide and mass atrocities are almost always preceded by a range of early warning signs. The Early Warning Project aims to improve the early warning system for mass atrocities using a mixture of crowd forecasting and statistical modelling. An annual comparison survey invites experts in the field to participate, presenting them with pairs of countries and then asking them to choose which is more likely to experience a new mass killing. The cases from the annual survey then inform the selection of countries which the Early Warning Project tracks in real time using a crowd prediction polling tool called Good Judgment Open. Anyone can sign up to take part and the insights from the crowd consensus help address gaps in the statistical model. Early Warning Project produces a ranked list of more than 160 countries based on their likelihood of experiencing an onset of mass killing in order to better target preventative action.



## data visualisation

Data visualisation encompasses a range of techniques for representing information, from complex graphs to mind-maps and tools for illustrating complex concepts or ideas. They can be static or dynamic, and they may also be connected to databases, or updated manually. Data visualisation can help to bring complex or messy data to life in new ways, aiding collective awareness and understanding of the issues that matter.



STAGE:  
CONNECT & INTERPRET



CASE STUDY: POL.IS

Pol.is is an example of an interactive survey tool that uses a statistical technique - known as principal component analysis - to visualise participants' opinions in real-time. Opinions are clustered, and users can click on different clusters to see how many people agreed or disagreed on certain statements. The tool was used as part of a consultation run by the Taiwanese government on how to regulate ridesharing companies. The visualisation helped people to understand the key dividing points among the 700 or so participants. Not only did this help lawmakers and participants gain greater understanding of the key areas of contention, it also helped participants arrive at a series of key consensus statements that were later used as the basis for new regulations.



## DECK: CREATE CHANGE METHOD CARDS

STAGE:  
CREATE CHANGE



# dashboard

Dashboards make data more useful by providing quick and customizable visualisations of different data streams or variables, usually represented interactively on a screen.

### CASE STUDY: PREMISE

In Brazil, locals are paid to upload photos of supermarket items to a platform called Premise. The platform processes about 42,000 images per day, each of which is vetted for accuracy and authenticity, before being aggregated and analysed. The data then becomes accessible via a dashboard, which can be customized to display contributor activity with maps, graphs or photo walls. As a result, commercial clients are given access to data on their markets often weeks before official government figures are released. NGOs may also use the data to see where resources need to be reassigned, and to understand or pre-empt food shortages.



# heatmap

A heatmap is a graphical representation of data where values are represented as shades or colours, overlaid on a matrix or map. It can help to quickly make sense of relationships between different variables, or trends presented geographically.

### CASE STUDY: CEASEFIRE IRAQ

Ceasefire has a civilian monitoring tool to monitor violations of human rights or international humanitarian law. People can submit reports of violations occurring anywhere in Iraq. Submitted reports are stripped of any personal identifying information and plotted onto a live map showing the distribution of violations by location and type. It is used to create a more accurate and up-to-date picture of the human rights violations on the ground, improving accountability and motivating a more effective national and international response.



## storytelling

A story takes facts, figures or information and turns into something that can be relayed in a more accessible way, in turn helping to make data or research more understandable and usable.



STAGE:  
CREATE CHANGE E1

### CASE STUDY: THE QUIPU PROJECT

In the 1990s, a family planning programme launched by the president of Peru led to the sterilization of over 270,000 women and 22,000 men. They were almost exclusively indigenous people living in rural areas, and thousands claimed it happened without their informed consent. Many of the people affected only spoke their native Quechua, and struggled to access institutions of the Spanish-speaking Peruvian State.

The Quipu project collected over 150 testimonies of sterilised people, presented as an interactive online documentary where users click on a visualisation of testimonies displayed as knotted strings (used by the Incas and Andean civilizations for record keeping). The project aims to create a collective memory archive of what happened, and to help build awareness in the victims' fight for recognition and reparation.



## what works centres

What Works Centres aim to ensure that public spending and practice is informed by the best available evidence. Centres operate in their own distinct way, but all aim to generate evidence and translate it into relevant and actionable guidance.



STAGE:  
CREATE CHANGE E1

### CASE STUDY: THE EDUCATION ENDOWMENT FOUNDATION (EEF)

The EEF is an independent charity dedicated to breaking the link between family income and educational achievement, by gathering research evidence and making it actionable to teachers and practitioners across the UK. EEF's Teaching Learning Toolkit is an accessible and interactive web tool that summarizes research evidence for teachers and schools on how to improve the attainment of disadvantaged people, according to cost, evidence and impact. More than half of secondary school leaders in the UK now say they use this resource.



# manual

A manual is a comprehensive and step-by-step guide to a particular topic. It may include instructions, tutorials or guides to help facilitate learning, the aim of which is to lower barriers to entry for beginners or practitioners wishing to participate.

### CASE STUDY: INSTRUCTABLES

Instructables.com is website specialising in user-created and do-it-yourself projects, from baking to 3D printing. By providing video aids, documentation and commenting functionality, the website aims to facilitate collaboration and shared learning among creatives, makers and artists. The website also holds contests each month to provide Instructables according to a unique theme. As of 2015, it was reported that the website has 30 million monthly users, resulting in more than 170,000 community authored projects across 6 categories.



# emergency alert

Emergency alerts improve awareness or speed up the response to an emergency or event. They often involve blending or integration of data, analysis and some form of prediction of the likelihood that an event will happen. This information is then presented on a map, sent via SMS, radio or email.

### CASE STUDY: VAMPIRE

The combination of El Niño - a severe and lengthy climatic event exacerbated by climate change - and severe drought in districts across Indonesia gravely intensified threats to food security in Indonesia. The Vulnerability Analysis Monitoring Platform for the Impact of Regional Events (VAMPIRE) was designed by Pulse Lab Jakarta and the World Food Programme to provide integrated map-based visualisations of how drought will affect local populations, bringing together household survey data, vegetation health, rainfall data and other indicators. Based on the measure of economic vulnerability and exposure to drought, the tool can alert authorities to areas where people may require assistance. It has been embedded into the situation room of the Office of the President of the Republic of Indonesia. Further improvements may include the integration of text-messaging alerts to notify farmers or other affected populations.



## open API

Application Programming Interfaces (APIs) provide the standards by which data is accessed and transferred between websites. Open APIs encourage collaboration and are built using open standards, allowing them to be freely accessed and used.



STAGE:  
CREATE CHANGE E1

### CASE STUDY: OPENAHJO

City Councils make hundreds of decisions every month, and it can be hard for both citizens and civil servants to follow the progress of legislation making its way through government. Open Decisions is Helsinki City Council's attempt to standardise and publish all of its decision making data electronically. Data about meetings, agendas and decisions from all across the council are tagged according to the Popolo open government standard, and then made available via an open API called OpenAhjo. By publishing the data via an open API, a range of developers have been able to create digital applications that notify local residents when decisions are made on topics of interest. It's also been used by city employees to more easily search and track progress made by local politicians.



## register

Registers are lists or datasets that act as core reference data, providing lists of things like schools, companies or job centres. Registers can help to coordinate tasks across diverse crowds, in turn improving collective memory and making collaboration easier across time and space.



STAGE:  
CREATE CHANGE E1

### CASE STUDY: EPISTEMONIKOS

Epistemonikos is allegedly the most comprehensive database of systematic reviews and other types of scientific evidence about health conditions and treatments. Initially, machine learning algorithms search through the major global health related databases to generate a longlist of potentially relevant articles, and assign scores to indicate certainty based on their relevance to the question. This longlist is then analysed for inclusion by at least 2 independent 'expert' humans in the loop, using a Tinder-like app. A validated dataset is then labelled and retained on the online platform for future use by the clinical community. The Chilean Ministry of Health issued 22 health guidelines within 6 months following an evidence review using the Epistemonikos platform.



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