

Module 8: Collective Intelligence

Welcome

In an earlier module, we focused on the central skill of problem definition, the importance of articulating a clear, compelling, and specific definition of a problem and its root causes..

As we said then, it is important to define the problem collaboratively.

But how do we undertake such collaboration efficiently and effectively? How do we tap people's expertise -- what we might call collective intelligence -- both to define the problem and to devise innovative solutions?

That's why today we look at how organizations are turning to new technology to create a conversation with a wider audience to tackle public problems more effectively and more legitimately.

By the end of this training module, you should be able to:

1. Understand why and when it is crucial to use such collective intelligence to define and to solve problems.
2. Describe a range of methods by which collective intelligence is being used in the public sector. Including open innovation, collaboration and co-creation.
3. Understand and apply the key considerations for designing an effective open innovation project.
4. Anticipate and mitigate common pitfalls when using open innovation to solve a public problem.

Collective intelligence is not a new idea. We've been using such practices for a very long time. Back in 1795, Napoleon, in fact, wanted a way to better preserve the food that his troops needed to survive the long Russian winters where they fought. They couldn't rely on the local populations to feed them and thus, they needed to carry their own food along. Thus, he put out a prize-backed challenge, offering a reward of 12,000 francs to improve upon food preservation methods.

It took 15 years to get the solution that he wanted, but a confectioner by the name of Nicolas Francois Appert, developed a method of heating and boiling and sealing food in airtight containers, that's pretty much the same process we use for conserving canned goods today.

Collective Intelligence describes how groups of people and machines assemble in ways that lead to advances in intelligence. Collective Intelligence, as we discussed in our Introduction to New Technologies, encompasses a broad range of practices.

These practices are also known in the business world as “open innovation.” And since that is a common term in widespread use, we want to make sure to mention it.

In the late 1970s Eric von Hippel put forward a new view of innovation where customers are as important as producers as sources of innovation.

In his article, “The Dominant Role of Users in the Scientific Instrument Innovation Process,” Hippel documented over 100 sources of the most important scientific and commercial innovations.

He found that approximately 80% of those new products had been invented and field-tested by the end user, that is, customers, rather than by a manufacturer.

Later, in 2003, Professor Henry Chesbrough, a professor at the Haas School of Business at the University of California, Berkeley, popularized the term “open innovation” to describe the distributed process of working across organizational boundaries to accelerate innovation.

What Kinds of Collective Intelligence are There?

If you want to take advantage of open innovation, you first have to decide what kind of collective intelligence you need. The practices of open innovation and collective intelligence can roughly be grouped into three different kinds of work:

1. CROWDSOURCING
2. COLLABORATION
3. CO-CREATION

Crowdsourcing, a term that blends crowd and outsourcing coined by journalist Jeff Howe in a 2005 eponymous book, defines Crowdsourcing as “the act of a company or

institution taking a function once performed by employees and outsourcing it to an undefined (and generally large) network of people in the form of an open call.”

Many famous demonstrations involve a large audience of volunteers guessing the number of jellybeans in a jar and having the guesses averaged. With a large enough number of guesses, the average converges on the right number. There isn't much collaboration among participants.

But today crowdsourcing has come to refer to almost any kind of public engagement regardless of how big the crowd is or how collaborative the project.

Frequently crowdsourcing comes in the form of a challenge or contest or competition often that involves soliciting responses from a group of people and picking a winner. . Contests work well when it's not obvious what combination of skills or even which technical approach will lead to the best outcome.

For example, to devise solutions, at the national level, federal agencies of the US Government have published over 1000 challenges on Challenge.gov since 2010.

To take one example, the Health Resources and Services Administration (HRSA) was able to launch a competition to address the “word gap” that occurs for low-income children due to limited early exposure to language. HRSA's Maternal and Child Health Bureau made \$300,000 in prizes available to spur innovative solutions to promote the early language environment. The goal of the Word Gap Challenge was to identify existing technology and expertise to spur the development of low-cost, scalable, and technologically-based interventions that drives parents and caregivers to talk to and engage in more back-and-forth interactions with their young children.

But prize-backed crowdsourcing, where there is a search for one solution is not the only way to take advantage of the wisdom of the crowd and, in fact, if you are seeking to leverage the crowd to better define your problem or even to come up with solutions, may not even be the best way.

What we will call COLLABORATION involves a shared product and inviting collaboration on a common project. Collaboration works well when a community can be marshaled with a common vision, getting many hands on deck to develop something together.

Wikipedia is a great example of collaboration.

Finally, the crowd can also be leveraged, not to work on one solution but to CO-CREATE many diverse responses to a question. In San Pedro Garza de Garcia in Mexico, the Mayor's Office and the City Council have tapped the collective wisdom of residents to develop a series of solutions to urban challenges.

Local Motors, founded in 2007, uses customer co-creation to design and manufacture new cars, coordinating the work of many people to develop a plethora of designs.

The City of Lakewood, Colorado makes up for lacking sustainability officials by coordinating the expertise of its residents to co-create diverse strategies for improving sustainability in their own communities. They devise and act on the policies they develop with support from the city.

Globally, the Building State Capability Program at Harvard, too, advocates a step-by-step process for co-creating public problem solving that begins with identifying a problem that matters with those affected. For example, in an effort to discourage youth from being recruited into illicit activities in southern Colombia, the Harvard team provided the process framework for local officials and stakeholders to co-create problem definition to ascertain why youth recruitment was taking place and engaging young people in coming up with diverse root causes to the problem.

What is the Value of Using Collective Intelligence?

There are many benefits to using open innovation processes like crowdsourcing, collaboration and co-creation in problem solving.

When we turn to a larger community of people, whether from a different agency, from another sector like academia or business, from our own community or around the globe, we are getting more hands on deck, more insights and experiences and more collective wisdom and action faster that make it possible to:

- 1) Identify a hard problem
- 2) Solve a hard problem

The diversity of people and perspectives can be very helpful as can simply having more people working together to accomplish what is hard for you to do working alone.

The crowdsourcing literature shows that when participants are asked to perform technical tasks with specific instructions, their performance is equal to or better than the performance of experts.

But these are just some of the reasons to prefer an open innovation approach

Now that we have outlined the different types of group work at the root of collective intelligence practices, let's look at how to design such a process. It is important to recognize that achieving the desired outcomes requires effective "choreography."

Designing an Open Innovation Exercise

Keep in mind at the outset that crowdsourcing, collaboration and co-creation are not always the right approach. Before turning to the crowd to define your problem or devise solutions, you need to design the process for doing so by creating a detailed plan with well-defined milestones that needs to address six steps.

1. Define a clear and compelling goal
2. Identify participants (e.g. employees, the general public, informed experts, participants with a particular skill) and any eligibility criteria
3. Define the tasks the crowd should perform (e.g. design a product, tag photos, classify information, analyze information, collect and share data, supply opinions, generate new ideas, contribute funds)
4. Determine appropriate incentives, including whether to use financial or non-financial incentives (or a mix)
5. Decide on assessment criteria for evaluating contributions, and depending on your specific process, appoint a process coach and mentor participants and winners
6. Develop a timeline, including determining the institutional resources (e.g. team composition) required to implement a successful crowdsourcing initiative and how to design the team to support and choosing a platform

First, we start by defining a clear and compelling goal and writing it down so it can be clearly articulated to others. What constitutes success? What outputs and outcomes are you seeking?

Second, you will need to define the audience you want to participate in your project, considering what input they can provide to help you better define or solve the problem.

Do you need to access domain experts with detailed knowledge of a specific field?

Or do you need to get a better insight into the problem by getting input from people with the lived experience of it?

Do you need to engage stakeholders in other agencies or in the wider public who may have important information?

And are their eligibility criteria such as age or location or other qualifications that will help you to target the people you most need to hear from.

Don't forget that you can use open innovation with your own colleagues across agencies as well as with local residents and global citizens. The sky's the limit!

Third, you should consider what are the tasks you want people to undertake. What type of participation will elicit the input you need?

Broadly speaking, tasks might include:

1) gathering ideas as the National Health Service in the UK did when it asked patients to diagnose problems with the nation's healthcare authority,

2) collecting data as the Cities of Antwerp and Barcelona are doing when they distribute strawberry plants to residents and asking them to use the plants as a way to gather data about air quality by testing the leaves over time. Many cities have 311 hotlines where people can complain about water leaks and potholes. This is a form of distributed data collection.

3) undertaking tasks as TED does when it coordinates volunteers to translate its globally popular lectures into multiple languages or as Oxford University's Galaxy Zoo does in collaboration with NASA when it asks distributed volunteers to label pictures of galaxies taken by the Hubble Space Telescope in an effort to categorize them.

Hackathons are another form of task-based open innovation. These are brief but intense efforts - running for a few hours or a few days - where participants gather to focus on a specific problem. Legal Hackers, for example, run events like these with justice system professionals to address problems in legal systems.

4) Sharing recommendations and opinions. The federal government solicits reactions to draft regulations prior to enactment via regulations gov

5) Crowdfunding is the special case of people coordinating and collecting money rather than data or ideas. Space Hive is a platform that helps local communities coordinate contributions to pay for things like renovating the park or starting a community garden.

Note that you may have to “chunk” or break down a bigger task into smaller, more discrete tasks. Thus, gathering data, analyzing data, visualizing data might usefully be separated because different people are good at these tasks.

Whatever task you ask people to undertake, be sure that the people involved understand clearly what is being asked of them and have the capacity, tools, and know-how to participate.

For example, when CityScan asked volunteers to collect data in the field, they equipped them with digital cameras and other state-of-the-art technology of the time and trained them in how to use it for collecting data.

Fourth, determine the incentives by asking “what will motivate people to contribute?

What is it that they would like in exchange for performing the specific activity that is being asked of them?”

Incentives don't have to be financial. In fact, research shows that intrinsic, namely non-financial, incentives often work better than cash prizes.

New Jersey's Innovation ENJINE Challenge, for example, offers winners rewards that are more tailored to the goal of the challenge such as the opportunity and resources to actually implement their project. The reward system was designed on the hypothesis that offering more goal-oriented rewards will attract participation from individuals who truly want to improve government operations.

Incentives you can consider include:

Knowledge Building – asking people to contribute to a specific field of knowledge

Skill Development – helping people to build a range of useful skills while they are participating in the challenge

Community Building – asking people to contribute to a large project of common interest

Civic Responsibility – encouraging people to do things that benefit the community and fellow citizens

Public Recognition – offering public acknowledgement and networking opportunities

Competition – appealing to those who are enthused by being challenged with a tough problem

Making a difference - offering the satisfaction of seeing their work implemented

And, of course, Financial Incentives – offering people money, prizes and free stuff.

It's important to understand your target audience, so that you can choose the combination of incentives that you believe will be most likely to motivate them to act or engage.

After thinking through potential motivation to participate, you want to think about the communication technology or platform that will best enable participation.

There are many to choose from.

Whether this is a crowdsourcing competition, collaboration or co-creation exercise, your fifth step is to determine how you will evaluate people's contributions.

Some possible methods are:

- Using expert judges to verify the quality of submissions and decide which to pursue. This is usually a good course of action when the submissions are less plentiful - so government staff can manage the workload - and when selecting the best inputs is more reliant on technical know-how or knowledge of government capacity to carry out projects.
- Asking the crowd itself to verify the quality of the activity performed by voting for the best choice or ranking submissions. This is common for e-petitioning or proposal-submitting platforms such as the New Jersey's Innovation ENJINE Challenge, where, for Stage One, participants rated the top ideas submitted by simply "liking" proposals. This method works best for open innovation processes where the volume of proposals or ideas and the number of participants are both high, and when maintaining transparency, participation, and representativeness is crucial.
- Creating a peer-review mechanism where a self-selected group of peers will verify the quality of the activity performed, similar to the way Wikipedia users and

editors maintain the quality of the crowdsourced content on the site. One approach involves a 'double-verification' process in which, if you are asking the crowd to classify an image, for example, the response is not officially recorded until a minimum number of other people give the same response. This is a useful method when you want to ensure that the quality of contributions is high and when the outputs are critical, such as an open innovation project where the decisions are binding.

- Seeking supporting evidence – for example, requiring people to upload a picture that verifies their submission, or other data that backs up what they are claiming or asserting.

Whichever method you use, it's good practice to be clear and upfront about who will decide and the criteria for assessment.

The last thing you want is to have the evaluators picking the most novel proposals when what you need are the most feasible ones.

Just as importantly, being transparent about how you will assess and use contributions builds trust in your process and enables people to provide you with better quality inputs.

Once you have the design finalized, it is time to create a timeline for the exercise and launch it. Create a detailed plan including dates and responsibilities and stick to it. You will want to determine:

- What needs to be done prior to launch and how long that period will take
- How long the actual exercise will be open for participation
- How long the results will take to analyze and publish
- Who will support and organize the process and who will implement and use the outputs?
- What platform will be used to undertake this activity?

Additionally, in most cases, whether you are trying to attract participation from a broader audience or you simply want to promote the work you are doing, it is ideal to have a communications strategy throughout the process to share your work. This can include, but is not limited to:

- Posting on social media
- Engaging key stakeholders
- Contacting partners

- Contacting publications
- Distributing information via mailing lists

Although the benefits of open innovation are many, there are still a number of common pitfalls. They include:

- Using open innovation at the wrong time. Open innovation works better where the needed insight and wisdom are widely distributed, where you are able to define a target audience that holds that expertise, and where a process for acquiring and selecting the best inputs can be clearly described. It is not always the right mechanism.
- Not motivating the right audience to participate. Unless you have a strategy for getting your intended audience involved, they often don't. For example, [research on Rahvakogu](#), an Estonian initiative which aimed to engage the general public to crowdsource proposals to reform the country's political financing system, found that a disproportionately large number of participants were middle aged males with a higher level of education, potentially skewing the nature and range of proposals. Not enough investment was made in attracting diverse participants.
- You have the input, but now you are not sure what to do with it. Too often, open innovation efforts are launched into the world without a clear strategy for using the input received. Not only does this lead to wasting government resources on open innovation efforts that don't yield any tangible benefit, it can discourage people from wanting to participate in future efforts – why participate if no one is going to act on my input?

When designed well and executed properly, using collective intelligence is an efficient and effective way to tap into the wisdom, expertise and lived-experience of the crowd. With an array of new technologies available for government to use, it is easier now than ever before to extract useful insights and contributions from people who have traditionally gone unheard and who have a lot to say both about how to define and how to solve public problems.