Decisions 2.0

A Framework for Harnessing Collective Intelligence

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Do such expressions as web 2.0, enterprise 2.0, crowdsourcing, crowdcasting, wiki, wisdom of crowds, social computing, information markets, sound like familiar buzzwords? Do you dismiss them as mere fads that have little conceptual depth and no relevance to business? If so, you are not alone. A firm believer in the benefits of harnessing collective intelligence in the right context (Bonabeau), but overwhelmed with the hype surrounding the new age of collective intelligence, I set out to organize my understanding of the new ideas and explore where and how they might apply. Each one of the concepts covers subtle or not so subtle variations of the same theme: that we can collectively solve problems better. Each promises a different way to leverage the power of the collective. That collective intelligence is at all possible is not a new idea, but until recently Charles Mackay's 1841 book, *Extraordinary Popular Delusions and the Madness of Crowds*, provided the default framework for the collective at work (Mackay): according to it, the most likely outcome of collective human dynamics is bubbles, instability and chaos. And indeed, as such manifestations of collective behavior as American Idol or Google's Zeitgeist (the most frequent search queries) show, the crowd does not necessarily have good taste. And many other examples suggest that the crowd does not know any better than experts. But there had been some documented evidence in the past that a group of diverse, independent, and reasonably informed people might outperform even the best individual estimate or decision: James Surowiecki's 2004 book, *The Wisdom of Crowds* (a play on Charles Mackay's title) offers a collection of such examples. The emergence of web-based tools for bringing people together in a variety of formats has made it possible to experiment with a number of different mechanisms for getting the best out of the collective. Such web-based tools as social networks, wikis and collaborative software constitute a paradigm shift for the way decisions get made and problems solved. Another consequence of the wide availability of the web has been the rise of professional amateurs: people who had the passion but no tools, from ornithologists to photographers, have been empowered with new technology that makes them perform at the same level as professionals. As a result, for a lot of problems you or your organization may have, there is potentially a solution out there, way outside of the traditional places you tend to search, within or outside your organization. Yet another form of collective decision-making emerges when participants *at the edge*, such as employees of a company or citizens in the fight against crime, are empowered to make their own myriad decisions based on information available to them, thereby creating value

for the group. It is not that many people contribute to a decision, but rather many individual decisions create a group-level pattern, in the same way that ants create efficient trail networks collectively with each ant making its own trail laying and trail following decisions.

Although collective intelligence encompasses more than mere decision-making, this short overview is only looking at how it can be leveraged to improve the way we make decisions. It does not cover, for example, collective co-creation of value. As individuals, we make good enough decisions every day. Most of them are unconscious. The human brain, a wonderful device that has evolved over thousands of years, works pretty well on its own in a wide range of situations. But it is wired to ignore complexity, not embrace it; to respond quickly to ensure survival, not explore endlessly. In other words, our evolved decision heuristics exhibit biases, which have been well documented over the last few decades in the behavioural economics literature. Such biases may be well suited to the environment of our ancestors, when a fast decision was often better than no decision. Today, there are many situations or jobs that require the kind of thin slicing we seem to excel at: policemen, fire-fighters, soldiers on the battlefield all need to make split-second decisions. Because so much of the decision making takes place below the consciousness level, we don't even know what affects our decisions: we don't know what we know, which, again, is often a good thing. But the hyper-connected and fast-paced world in which we live requires both low response time AND more accurate responses AND more exploration. Indeed, evolutionary pressure applies to the world of business too: companies have to be more innovative AND faster AND nimbler AND understand their customers, employees and other stakeholders better. The good news: connectivity means more data, sometimes much more data, about customers, employees and other stakeholders, so that, in principle, it becomes possible to know them more accurately and more intimately. But it is not enough. Decisions still need to be made. The data needs to be explored, opportunities discovered, evaluated and acted upon. Upon recognition of our limitations as individual decision-makers, a question of practical interest is: can we make better decisions collectively than as individuals?

Companies have for a long time used teams to "solve" problems, focus groups to "understand" their customers and "explore" their needs, and annual meetings to "listen" to their shareholders. But the words solve, understand, explore and listen have just now taken on a whole new meaning. Thanks to a recent convergence of concepts and technology, it is now possible to tap into "the collective" to make better decisions. The proliferation of Web 2.0 tools, a diverse collection of web-based participation and distributed value creation technologies, necessitates a framework for understanding what type of collective intelligence is (im)possible, (un)desirable, (un)affordable and under what conditions.

As a starting point, let's define the decision framework to be used throughout the article. The framework is borrowed from the field of Operations Research, whereby solving a problem entails two high-level tasks: (1) generating options (a task that includes framing the problem and establishing a set of working assumptions about it) and (2) evaluating them. Each of these tasks is subject to varying levels of complexity. Human decision heuristics are biased along these two dimensions: there are *generation biases* and *evaluation biases.* Table 1 provides a selection of generation and evaluation biases, as well as possible collective mitigation strategies.

Biases	Individual Biases	Possible mitigation by collective	Possible strategies
Generation Biases			
Self-serving bias	Seek to confirm assumptions	Diversity of assumptions	Outreach
Social interference	Influenced by others	Independent participants	Additive aggregation
Availability bias	Satisfied with easy solution	Diversity of "easy" solutions	Outreach
Self-confidence	Believes to have found solution	Diversity of solutions	Outreach
Anchoring	Explores in the vicinity of anchor	Diversity of anchors	Outreach
Belief perseverance	Keeps believing despite evidence	Diversity of beliefs	Outreach
Stimulation bias	"Only knows it when seeing it"	Diversity of stimuli	Outreach, self-organization
Evaluation Biases			
Linearity	Seeks simple cause-effect	Nonlinear interactions	Self-organization
Local vs global	Confuses local and global	Nonlinear interactions	Self-organization
Statistical bias	Not good at statistics	Law of large numbers	Additive aggregation
Pattern obsession	Sees patterns where there is none	Diversity of pattern detectors	Additive aggregation, outreach
Framing	Influenced by presentation	Diversity of influences	Additive aggregation
Hyperbolic discounting	Dominated by short term effects	Diversity of time scales	Additive aggregation
Endowment bias	Aversion to risk, loss	Diversity of risk profiles	Additive aggregation

Table 1

Some of the examples described in this article resort to the collective for generation only (e.g., Innocentive, where solutions are reviewed by the problem poster), for evaluation only (e.g., HSX seeks to evaluate the money making potential of movies), or both (for example, Digg asks participants to both contribute stories and vote on them).

I have found three very general types of strategies (Table 2) –which can sometimes be combined:

- ***Outreach***. It consists of reaching out to individuals or groups beyond traditional boundaries (which could be the walls of the organization as well as, for example, hierarchical or functional barriers inside the organization) to collect ideas (generation tasks) or assessments (evaluation tasks). The value of outreach is in numbers: broadening the decision-maker or solver set, or broadening the consideration set. There are people out there, not where you would expect them, who may be able to help. At Innocentive, for example, 75% of successful solvers already knew the solution to the problem and they often come from a different discipline. Another example is Open Source: "with many eyeballs, any bug is shallow", is a famous expression.
- ***Additive Aggregation***. It consists of collecting ideas (generation tasks) or assessments (evaluation tasks) and performing some kind of averaging. Additive aggregation may be a way to aggregate information from traditional decision groups, or it may be combined with

outreach to aggregate information from a broader set of people. Here, the whole is, by definition, the sum (or some average) of the parts. The simplest examples involve the direct application of the law of large numbers (e.g., how many jelly beans in the jar?). More complex examples involve market designs, such as information markets. The key is to maintain a balance between diversity and expertise. Both are needed. In fact, in the simplest form of additive aggregation, it can be shown mathematically that collective error = average individual error – diversity. The average individual error is a reflection of how knowledgeable individuals are, and diversity means diversity of opinions. At BestBuy, for example, internal information markets are used for a number of forecast activities; while a number of the forecast tasks are successful, one situation where the market performs particularly poorly is related for questions about the competition, which BestBuy employees know little about.

- ***Self-Organization***. It consists of mechanisms that usually involve interactions among group members so that the whole is more than the sum of the parts. While the other mechanisms improve decision-making, self-organization makes collective innovation possible in the decision process. The downside is that, if the mechanisms are designed improperly, the whole can end up being less than the sum of the parts. Groupthink and hijacking are two examples of interactions gone bad. Information markets, while firmly in the previous category, do sometimes self-organize when the behavior of participants becomes correlated, either because they are directly communicating (clustered behavior observed at Google), or because they are all biased in the same way (such as the over-optimism of newcomers at Google) and respond to the same stock price –which is a form of indirect interaction. The problem is that information markets are expected to perform a different function (manifested in the desire for market efficiency), so that self-organization in a market is usually not a good thing. Deviations from market efficiency, however, do provide insights into the behaviors of the participants. There are also more constructive examples of self-organization, where interactions create additional value: Wikipedia, the CIA's Intellipedia (a version of Wikipedia for the Intelligence Community) or Digg, where participants create value by deleting from, and adding to, other participants' contributions.

Mechanisms	Examples	Key Issues
Outreach	Innocentive, Mechanical Turk, Toolkits, Crowdcasting	Lack of control, intellectual property
Additive aggregation	Information markets, ESP Game	Diversity vs expertise, mechanism design, engagement
Self-organization	Wikipedia, Affinova, Digg, StumbleUpon, Open Source	Lack of control, mechanism design, policing

Table 2

Some key issues arise when attempting to deploy these mechanisms for decision making (Table 2).

- ***Control***. One key issue, common to all forms of collective intelligence, is a loss of control, which may manifest itself in a variety of ways: undesirable outcome (the collective makes a decision which is not desirable from the stakeholders' perspective –revealing either a flaw in stakeholder thinking or the improper application of collective intelligence), un-anticipated outcome (the outcome is not necessarily bad but the organization is caught unprepared to deal with it), snowball effect in opinion formation (which happens with self-organization, where one opinion my gain nonlinear momentum from self-amplification, leading to PR nightmares if the collective involve participants outside the organization), volatility in collective dynamics (difficult to read what is happening), unpredictability (what is going to come out?), liabilities (who is responsible for a poor decision made collectively?). If you are thinking about resorting to collective intelligence for decision-making, think about the possible consequences and how much control you are willing to give up.
- ***Intellectual Property***. Another issue is that of intellectual property. This issue manifests itself in two ways. The most obvious one is that you need to disclose information about your issues to get other people to think about it. Many businesses will find it difficult to broadcast critical issues. In addition, if you are seeking ideas from outside your organization, you have to make sure that the terms of engagement include a transfer of intellectual property, but you must also ensure that the intellectual property is the participant's to give. Mechanisms can be put in place to address the latter issue, but the first one will require a change in mindset.
- ***Diversity and Expertise***. While the 2.0 version of decision making makes use of a collective, striking the right balance between diversity and expertise is a challenge. No amount of diversity will help if the participants are completely ignorant of the issues. Certain problems lend themselves to a diversity-based approach more than others. You have to decide who to involve based on their ability to understand the problem and to contribute creatively. Consider the following cautionary tale: at PK-35, a Finnish soccer club, the team's coach invited fans to determine its recruiting, training, and even game tactics by allowing them to vote using their cell phones. "Each week, coach Viljamaa provides between 3 and 10 questions to answer about training, team selection, and game tactics. Fans get three minutes to enter responses, and they get the results back three minutes later. (Fan-driven decisions can produce dramatic results, like the decision to bring on substitute Hannu Takala, who scored a last-minute goal against FC Lahti in an end-of-season clincher.)" (Fast Company, March 2002). The 2002 soccer season was so disastrous that PK-35 fired its coach and scrap its fan-driven ways. Another dimension of diversity is the actual composition of diversity: in the same way that sampling biases exist in polls, diversity may be biased and lead to distorted collective decisions.
- ***Engagement***. The issue of engagement is extremely important. Motivations for participating in a collective decision effort vary wildly. Such incentives as money, prizes, promotions, miles, etc, can stimulate people to participate in activities ranging from prediction markets (where explicit rewards seem to matter a lot) to submitting T-shirt designs at Threadless (where cash seems to matter less than recognition). Value-driven incentives, such as increased status and recognition, participation in community service, being part of a community, civic duty, the desire to transfer knowledge or share experiences, can be powerful motivators, as such examples as the open source movement or Wikipedia show. For internal efforts, engagement tends to start high and then fade, unless a flow of new

enthusiastic participants keeps engagement high. At Google, new employees are the most enthusiastic about, and engaged in, prediction markets; enthusiasm decreases over time. BestBuy reports having to "market the market", referring to their internal prediction market. Whether your Decision 2.0 initiative is internal or external, mixing the two types of incentives may not be a good idea: studies in psychology and behavioral economics have shown that introducing monetary rewards in a situation dominated by a desire to contribute may do altogether with the altruistic component of behavior. Other forms of recognition are more desirable.

- ***Mechanism design***. This is the most difficult issue of all. Collective decision making has been empirically driven and for one Wikipedia, there are probably lots of failed attempts that the public hasn't heard of. As a result it is difficult to build a good design framework. But what is clear is that the rules of engagement can make an enormous difference: collective intelligence requires a lot of care –and participants expect care. Even a success story such as Wikipedia, with its carefully evolved hierarchy of editors, is a lot more complex than most people may be aware of. Rather than tinker with other designs and see them fail, many organizations seek to replicate exactly. A case in point is Intellipedia, the (apparently –it is classified) successful tool developed for the US Intelligence Community, which is a direct copy of the Wikipedia design. Probably a good idea. Others have introduced design innovations (such as TopCoder's Collaborative Competition approach or Matlab's programming contests allowing "code theft") or have seen the emergence of new designs (for example, teams competing for the Netflix Prize decided to share their code). However, on Marketocracy, trading algorithms saw their performance plummet when members were allowed to talk to one another –and make similar trades, an illustration of the issue of self-organization in the wrong context. The company had to implement ways to prevent participants from sharing their trading ideas. This shows that a careful balance needs to be found between independence and community through the design of appropriate mechanisms.
- ***Policing***. Another issue, related to that of mechanism design, is policing. When groups of participants are allowed to contribute to decisions, the likelihood that some will misbehave increases with group size. Mutual policing works in situations where there is an implicit code of conduct. Reputational punishment, on the other hand, is a dangerous tool, as some participants may become too worried about doing anything wrong. In prediction markets, a central authority akin to the SEC may be necessary to avoid market manipulation.

Another set of distinctions are relevant for categorizing various implementations of Decisions 2.0 and helping decide how to proceed with a collective decision making initiative. Table 3 shows all dimensions with associated examples, and Table 4 lists all the examples used in this article.

- ***Internal, External***. The decision to expand your decision-maker set beyond the walls of your organization cannot be taken lightly. First because once the genie is out of the bottle, well, it is out for good. Second because the loss of control may be a lot more severe and damage control a lot more difficult if you involve outsiders. Not only are you disclosing information about your organization, you are also

providing a forum for other people to express themselves. On the flip side, the world outside your organization is much bigger than what's inside.

- ***Distributed, Decentralized***. I have found an important dichotomy between distributed decisions and decentralized decisions. Distributed means that a number of people contribute to one decision. Distributed is the most familiar form of collective intelligence. Decentralized means that many people are empowered to make their own decisions. For example, sousveillance and smart mobs illustrate decentralized intelligence and can be put to societal use. Another example can be found at web sites such as ManyEyes or Swivel, where participants can upload datasets and/or explore existing datasets with easy-to-use tools. If someone found CO2 level data for an area and someone else found, say, housing development data, yet another person may decide to mix the two datasets into a "mashup" or combined view on a map where you can see the correlations (or lack thereof) between the two phenomena. In the military, asymmetric warfare against terrorist threats requires a shift from traditional command and control to decentralized decisions. Numerous examples of disaster response, from the 2004 tsunami to hurricane Katrina, have demonstrated the power of decentralized decisions made by people on the ground: sophisticated plans concocted by central bureaucrats fall apart as soon as disaster hits. A lesson that should not be lost on the nonprofit and commercial sectors: decisions made at the head office may not fit local or field realities. Flight attendants need to be able to make quick decisions when an aircraft is stranded for hours on the tarmac of a random airport during a storm. Harnessing the collective intelligence of those who have information for the benefit of those who must take action in the field is the surest path to success: rather than impose top down, template-based decisions, the organization becomes a broker of information.
- ***Explicit, Implicit***. People may do things that have some intrinsic value to them –such as linking to another web page from their own web page. Such actions or information can be aggregated for the greater good: Google is the perfect example of implicit collective intelligence, where the PageRank of a webpage is the (mostly valuable) emergent outcome of large numbers of web pages linking to and from one another. Collaborative filtering mechanisms help you make better decisions by drawing on the collective, but you will implicitly contribute to the value of the filter with your own actions. Another, more subtle, example
- ***Group Size***. Another dimension to consider is how many participants will contribute to decision making. For some of the problems described here, the value of Decision 2.0 lies in large numbers, so the question does not arise. But assume that you need to make a decision about a problem that requires a significant amount of expertise only found in a handful of people –inside or outside your organization. There are traditional tools, such as the Delphi approach to consensus building, that can foster quality decisions in small groups. HP Labs came up with an intriguing solution for tapping the collective brainpower of a small group using a prediction market. The solution consists of extracting the participants' risk profiles with a simple game, and then adjust the market's behavior with the risk profiles.

Tasks	Internal	External	Distributed	Decentralized	Implicit	Explicit	Large group	Small group
Generation								
Collection	Internal Wiki, Intelipedia, Bell Canada ID-Ah!, Suggestion box	Google, Wikipedia, blogs. Threadless, crowdsourcing	Google, crowdsourcing	Twitter, micro-blogging	Google, blogs	Stargazing, disaster Wiki, Wikipedia	Google	Delphi
Search/Discovery	IBM Innovation Jam	Recommendation engine, Innocentive, NSA crypto hacker, crowdsourcing	Innocentive, Goldcorp, P&G's Connect and Develop	Sousveillance, Cajun Navy, Sunlight, smart mobs, Swivel, Many Eyes, Ohmynews	Blogs, Delicious	Innocentive	Blogs	Community
Design	Collaborative CAD	Affinova	Affinova, Lead user toolkits (Lego), Open Source	Support forums (Dell, Linksys)	Website morphing	Affinova, Open Source	Affinova	Collaborative CAD
Evaluation								
Assessment	Delphi, Information market, averaging	Information markets: HSX, Iowa Political Stock Exchange, Peer-to-Patent	Information market, MTurk, NASA clickworkers	Net-centric warfare	Google, StumbleUpon, Delicious	MTurk, ESP game, Open Source	Information market	HP small group market, Delphi
Triage	Internal Digg (e.g., Crispy News)	Digg, Zagat, Salesforce.com's Idea Exchange, Dell IdeaStorm	Affinova, Zagat, Digg	Net-centric warfare	Apple App store	Digg	Digg	Panel of judges
Selection/Choice	Bell Canada ID-Ah! (voting)	Digg, Threadless, American Idol,	Digg, Kasparov vs World, Threadless, American Idol	Net-centric warfare	Smart Mobs	Digg	Digg	Panel of judges, board of directors

Table 3

Examples	Description
Affinova	A market research company that asks consumers to participate in an iterative product design process.
American Idol	Audience can vote for their favorite singer.
Cajun Navy	A group of boat owners saved more lives than any government organization during the Katrina disaster.
Delicious	Tagging system which, when used by many people, gives insights into the interests of the collective.
Digg	News site where users can vote on stories. The most popular stories make it to the landing page.
ESP Game	Game in which two or more players have to agree on, for example, keywords to describe an image.
Goldcorp	Gold mining company that published its geological data and started a contest to stimulate predictive models.
Google Search	Google's page ranking algorithm is a complex function of collective link structure.
HSX	Mock market where users can buy and sell futures depending on how they think a movie will perform.
ID-Ah! (Bell Canada)	Suggestion box.
Idea Exchange (Salesforce)	Suggestion box used for prioritization.
Idea Jam (IBM)	Suggestion box used for idea generation.
Idea Storm (Dell)	Suggestion box.
Innocentive	Companies (Posters) post problems, contributors (Solvers) can submit solutions (seen by Solvers only) for cash prize.
Iowa Electronic Markets	Information market (with real money) where people can buy and sell futures in connection to political events.
Intellipedia	The US Intelligence Community's version of Wikipedia.
Kasparov vs the World	People around the world could suggest moves. Kasparov won but said it was one of the hardest games in his life.
ManyEyes, Swivel	Websites where users can upload data sets and/or play with available data sets using tools.
Marketocracy	Members submit and test trading algorithms. The best ones are used for actual trading and income shared.
Mechanical Turk	An Amazon service whereby companies can submit tasks that participants can work on.
NASA Clickworkers	System whereby anyone can participate in a NASA task, such as finding craters on Mars.
Net-Centric Warfare	A US DoD concept whereby warfighters at the edge (on the field) drive information needs.
Netflix	DVD rental company used a contest to improve on its recommendation engine.
NewsFutures, Inkling, Intrade	Companies that provide information market infrastructure
NIST Cryptography competition	US National Institute of Standards and Technology (NIST)-run contest to find new Advanced Encryption System.
Peer-to-Patent	System whereby anyone can comment on, and find prior art related to, patent applications.
PK-35	Finnish soccer team that asked fans for team composition. Ended in disastrous season, coach fired.
Smart Mob	A group of people swarming to a location or event, or otherwise coordinating through technology –SMS, Twitter.
Social Network	A collection of people connected to one another via a web-based utility (e.g., Ning, Facebook, MySpace, Orkut).
Sousveillance	A form of decentralized intelligence where many "little brothers" collect information. A play on the word surveillance.
StumbleUpon	System whereby one can follow links suggested by other people with the same "interests".
Threadless	Website where users can contribute T-shirt designs, which are voted on by the community. Best are produced.
TopCoder	Coding contest whereby a problem is subdivided into slices tackled by the community.
Twitter	A micro-blogging platform whereby users can submit short text messages viewed by a group.
Vote on plot	An approach whereby the audience votes on a plot, e.g., NBC asking viewers to vote on Law and Order character.

Who Wants to be a Millionaire?	Game where player can ask a friend expert (right 65% of the time) or the audience ("right" 91% of the time).
Whistleblower	Website where one can submit reports of wrongdoing anonymously.
Wikipedia	Online encyclopedia where anyone can contribute. A small fraction contributes a large amount.
Zagat	Restaurant (and other services) guide in which users rate their experiences. Published grade is average of users'.

Table 4

Government, nonprofit and commercial organizations need to embrace new paradigms for making decisions in an increasingly complex, fast moving, connected world. Table 5 lists possible applications, and Table 6 the Decision 2.0 infrastructure needed to support these activities. Some of the examples mentioned in the article are directly applicable to an organization, others are just metaphors for how to approach collective decision-making.

Applications	Examples
Forecast	Information markets
Market Research	Affinova, MTurk
Access to talent	Innocentive, TopCoder
Knowledge management	Intellipedia, ESP Game
Disaster response	Cajun navy, disaster wikis, Twitter
System testing	Crypto Hacker, Open Source, Peer-to-Patent

Table 5

Decision Infrastructure	Examples	When to use it
Internal Outreach	Information markets, Innovation Jam	Knowledge outside traditional boundaries, but within organization
External Outreach	Innocentive, Top Coder, Idea Crossing	Knowledge outside of the walls of the organization
Self-organizing wiki	Wikipedia, Intellipedia, Digg	To create a collective knowledge base
Social network	Ning	To promote self-organizing knowledge flows and communities of interest
Information market	Google, BestBuy, HP	To tap into your organization's collective wisdom to forecast, manage risk
Power to the edge	Cajun navy, disaster wikis, Twitter	People in the field are in a better position to assess situation
Toolkits + Social site	Lego	Your most passionate customers/users are in the best position to create

Table 6

One interesting question one may still have after reviewing the fast increasing body of work pertaining to Decisions 2.0 is: do the biases correct? The only possible answer is: sometimes! There are a number of documented examples of biases still at work in collective decision making, such as in information markets, where biases manifest themselves in all the ways they exist in individual decision making: over-optimism, pattern detector in overdrive, social influence, etc. However, it is fair to say that collective intelligence works better in practice than in theory. An early

contributor to the field of collective intelligence, I was certain that Wikipedia would be a failure. Why it works so powerfully well is still largely a mystery to me. That's where research and theory are needed. Today, practice is ahead of theory, which is not a bad thing except for the unavoidable pseudo-scientific post-rationalization one often hears, based on nothing more than anecdotal scientific evidence. One notable exception is prediction markets, where a large body of work helps understand what works and why. Efforts are also underway by several groups of researchers, such HP Labs or IBM Research, to understand the dynamics of such collective intelligence examples as Digg or Wikipedia.

However, a mere survey of the possibilities leads me to make two important observations:

1. The general task area in which collective intelligence tends to correct individual biases the most is that of generation. I would speculate that we, as individuals, are far weaker explorers than evaluators and that, for all the flaws in our heuristics, we are darn good pattern detectors. When thinking about tapping the collective for decision making, know that you are likely to get a lot more value out of idea generation than out of idea evaluation.
2. Another striking feature of most examples is that feedback loops between generation and evaluation tend to be weak or non-existent. The similarity of the generation-evaluation framework to the fundamental mechanisms of evolution, variation and selection, makes it clear what I mean: in evolution, "ideas" are generated and evaluated and the output of the evaluation goes into the generation of the next generation. Why can't we do the same here? In fact, Affinova takes the metaphor quite literally, using collective feedback to create a new generation of designs which are again submitted to the collective for evaluation. Such feedback loops should be a lot more common as they take the collective through an iterative decision process.

This short overview was not intended to be thorough in any way but to provide a framework that can help you assess where and how collective intelligence can be leveraged. A much more exhaustive coverage of the field, as well as a very good taxonomy of Collective Intelligence, can be found at the MIT Center for Collective Intelligence (cci.mit.edu).

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