Towards a Language of Collective Intelligence

Pierre Lévy

The Ecology of Ideas

Language, with its different recognizable sounds, has opened up to humanity the possibility of asking questions, telling stories, and participating in dialogue. Language has allowed the emergence of unknown entities in animal societies: numbers, gods, laws, works of art, calendars, the technological adventure, and the entire cultural universe. I will designate here by the term "ideas" those complex forms that appear, reproduce themselves, and evolve only in the world of culture, in the space of signification opened up by language. Language has allowed human communities, as compared to hives, herds and packs, to make a leap of collective intelligence because language creates a stronger and more supple link of competitive cooperation than what insects or monkeys have in their respective communities. In putting the idea at the center of my model, I have chosen an approach to human collective intelligence that radically distinguishes it from the collective intelligence of other animal societies. From this perspective, language represents the limit or threshold beyond which ecosystems of ideas are constituted. These are like spiritual hypertexts living in symbiosis with the societies of talking primates we humans form. These ecosystems of ideas grow more complex, die out, diversify, or combine in such a way as to lead those societies that cultivate them down, the in part undetermined, road of cultural evolution. Teilhard de Chardin coined the term "Noosphere" to describe the world ecosystem of all the ideas which globalization and the development of the means of communication, whose culmination we see in cyberspace, have only begun to put at our fingertips.

Human communities can survive only by maintaining cultures, that is, semi-closed collective intelligences conducive to the breeding (reproduction and selection) of ideas. An ethical person, a corporation, an institution, a nation, a religion, a political party, a science, a virtual community or a tribe cultivates—*nolens volens*—ecosystems of ideas. In the course of its existence, a culture explores a viable evolutionary direction for its ideas.

Our mental representations give ideas their forms. In a way, representations are the face, or the mask, of ideas. Representations can be of all kinds; their variety is in theory unlimited : e.g. the images of our perceptions, such as those created by human works of art, music, symbols, and the structures of highly complex relations that have been constructed by means of language and many other sign systems.

Our intentions are the souls of ideas: the movement which animates the face. Intentions direct the mental representations toward particular destinations, or particular targets. They entrust ideas with a goal, which can be quite near, or even very far away, aiming at almost inaccessible horizons. We can think of intentions as the abstract structure of emotions, in other words, as vectors endowed with a force (intensity) and a direction (the "nature" of the emotion). Representations must be distinguished from emotions because the same representation, depending on the circumstances, can serve as a face for very different emotions.

Our skills and abilities are the reproductive, motor and nutritive organs that our minds offer the world of ideas. These are the human faculties by means of which our principal

symbiotic partners—symbols—are conceived, reproduced and maintained. Thus culture "breeds" certain human qualities (in preference to others), or certain skills and abilities which are the particular organs of the ideas whose evolution the culture is exploring.

The symbiotic relation between populations and ecosystems of ideas (each feeding off the life of the other) has important consequences. Some populations allow for a more favorable reproduction of ideas, especially where writing, mass communications media, institutions and "values" are at work, since they facilitate collective intelligence and the flowering of the life of the mind. Such populations benefit in turn from those cultural means that support their demographic performance and health. Those ecologies of ideas that offer populations the best competitive advantages receive, by this very fact, the human resources and technologies that ensure their duration, abundance and diversity. On the other hand, populations that select ecosystems of ideas leading to their deterioration or self-destruction in one way or another, cannot for very long reproduce themselves, and consequently, will not be able to reproduce those very ecosystems of ideas. In a word, the process of cultural evolution essentially consists in a mutual selection of the two symbiotic (or symbolic) "halves:" ecologies of ideas and human populations, *without any fixed point or absolute causal endpoint.*

A new idea (a new circuit of complex cognitive acts) lasts or is reproduced only if its "repercussions" are favorable to the population of ideas that sustain it: those ideas without any positive cooperative repercussion are not "viable." Any idea which destroys the environment that nourished it by pillaging its resources without giving anything back is not "durable." The processes of mutation, reproduction and selection of ideas, just like the reciprocal influence which they exert on the populations that shelter them, are governed by multiple and complex rhythms and durations. *They also depend very much on historical and geographical contexts.* Thus the mission of the collective intelligence research community is not to pass "scientific" (much less "definitive") judgment on whether ideas are good or bad. From this perspective, the good and the bad are not stable, well-defined qualities of particular ideas. An idea is not good or bad "in itself." But in those circumstances where it arises, an idea helps or hinders the culture that shelters it according to the particular situation of a highly sensitive and complex ecological system. That's one reason why I've chosen the game as a model: a game-piece (an idea) is neither good nor bad; it is merely the vehicle of a certain power. On the other hand, in the course of a game, it is necessary to evaluate and hierarchize the value of possible moves which this game-piece (this idea) can make. In other words, an idea cannot be the object of an a priori moral evaluation. Only an act can be directly judged; an idea must have inspired many acts in the cultures and different situations before we can make an informed judgment about it. Ideas have value only in the long term effects of the acts they inspire, impacting the well-being of those who cultivate them.

The orientation that the evolution of ecosystems receive most often comes from the retroaction due to the effects (unfavorable after a period of time) produced on the human beings who cultivate these ecosystems. So, why do we want to create a science or deliberate cultivation of collective intelligence when "natural selection" happens automatically? Because another form of evolution is possible: *deliberately cultivating ecosystems of ideas so their evolution may result in an increase in collective intelligence,* and thus an increase in the health, economic prosperity, cultural capital, and spiritual refinement of the communities that care for them, raise them, and select them. This second option is in every respect more prudent, because it is less costly to human populations.

Having spent the better part of its existence living in the oral culture of nomad tribes, humanity took a giant step forward when it domesticated and deliberately selected animal and plant species. Humanity is today confronted by the challenge of organizing in a delib-

erate fashion the various disciplines of knowledge, intentions, and know-how that form the basis of the life and evolution of ideas. Today, as formerly, a decisive step will allow us to create a much more secure future for posterity. Beyond agriculture, the same evolutionary leap is responsible for creating the city, the state, and writing. In Mesopotamia, in Egypt, in the Indus valleys, in China, and in the great Pre-Columbian civilizations, the same steps seem to have been taken in succession: agriculture, city, temples, states, and in every case (most of the time independently of one another) the invention of an ideographic writing—the culmination of the process. In my opinion, we are once again experiencing the same type of innovation, but much faster and on a much greater scale. In combination with alphabetic writing, the invention of the printing press triggered a movement of global mutation in the ecosystem of ideas. The revolution of experimental science, coupled with the industrial revolution, destabilized the old Neolithic civilizations and led culture to a second massive mutation. The destruction of the family, mass urbanization, global economic integration, the multiplication of transportation and human contacts, and finally the birth of cyberspace as an interactive instrument of communication that goes beyond borders and reconfigures public space on a new scale and in a new form—all these events converge, in my opinion, on the birth of a meta-city. The continuation of all those movements now in process seem to point toward the appearance of new political, economic, and cultural forms for the generations who will come after us. The many conflicts tearing humanity apart express the extreme tension which this mutation is causing us to undergo, especially when we cannot see the "goal." In this time of uncertainty, a few major principles do seem clear, such as the desire to have ideas and knowledge henceforth constitute "the wealth of nations." It is this new phase of the human adventure that the science-art of collective intelligence wishes to support.

The first farmers of the Neolithic age furnished the name and the very model of culture, its relationship to time. Neolithic writing is itself an analogue for agriculture. Ideas are cultivated just like domestic plants. Signs are planted on clay, or on all kinds of earthen materials, whether heavy or fragile. Reading is like a harvest, the multiplication of the planted signs in the mind … not to mention the multiplication of the ideas attached to these signs. Scientists in biotechnology today can decode genomes, reprogram them, and manipulate the workings of cells at the molecular level. Similarly, it is possible that the meta-writing (or super-language) of the future will be founded on the tridimensional manipulation in cyberspace of a kind of dynamic cultural code.

The shepherds and farmers who come after us will cultivate organisms and ideas in the same way, sowing and reaping to the rhythm of the seasons. We will manipulate ideas by means of the knowledge we have of their "code," and we will launch them in the market place or in the cultural environment, once we have run simulations of their ecological and economic effects. In response to this new "post-modern" condition, the science of collective intelligence (or the science of ecosystems of ideas) proposes to perform the simulations of the interactions among ideas. It is not unreasonable to imagine the essential characteristics of this new writing. It should express in a synthetic manner the ecological dynamics of a great many different ideas. It should allow the rapid verification of the viability of an ecosystem of ideas. Finally, it should contain in its very structure a decisive piece of information concerning the organization of the world of ideas. In a word, it could be a semantic encoding of the universe different from that of language, different as well from the writings inherited from the Neolithic age which over-coded orality on a fixed and durable base. The new encoding will certainly be visual, like classical writing, but it will also be tridimensional, animated and interactive, like a video game or the graphic simulation of a scientist in biology. The ideograms will play the part of elementary "characters" in a virtual world.

To repeat, in the metacultural framework I have here sketched, a prudent plan of action for collective intelligence consists in optimizing the "cultivation," for any given community, of the ecology of ideas with which it lives in symbiosis, and in judiciously orienting its evolution. The development of operative and testable models of collective intelligence is a means to this end, and the "language game" which I have here proposed is meant to exercise our minds in the dynamic modeling of the cultural ecosystem.

A Free Software: The Game of Collective Intelligence

To make collective intelligence a stable object of knowledge, it seems useful to make it *visible* by means of symbolic images. There indeed exists a much remarked link between the development of a science and the development of its instruments of observation, visualization, and representation. The telescope, the microscope, cartography, or the new images in medical science clearly illustrate this relationship. Furthermore, the great periods of cultural invention have often forged a strong relationship among drawing, "spatialization" and thought. To confirm this, we need only look to the ideographic writings that accompanied the birth of Egyptian and Chinese civilization, to the role geometry played in classical Greek culture, and the role that geometric perspective played in the Renaissance. Each of these great periods of cultural creation have likewise produced remarkable forms of urbanism, architecture, and monumentality.

In the twentieth-century, the digital image is inaugurating a new dialectic among space, vision, and reason. The number of scientific disciplines that use digital images to visualize their data is beyond reckoning. At the same time, in the industrial sector, the design and management of complex processes increasingly rely on computerized graphic simulations. Finally, the link between architecture, urbanism, and virtual worlds, already well under way, is destined to grow ever closer in the future. Traditional instruments of observation had opened the door to the infinitesimal, the far away, the immense, and the hidden. Today, computer technology lets us transform masses of digitized data into images, indeed, into universes yet to be explored, and thereby opening the door to the (indirect) vision of *the super complex and the abstract.* We may advance the following hypothesis: the universe of information, interests, knowledge, and expertise—i.e. semantic space—is destined to become formative with respect to other spaces. It naturally follows that we must envision the conception of software that calculates—from the flow of empirical data coming in from real communities—*visual representations of collective intelligence, its conditions of development and its environment.* These representations should be readable and explorable in virtual space in order to help people and groups orient themselves in abstract space (which is nonetheless influential), on which everything will increasingly depend. The project of the research network I direct is to construct such software and to test it using real data. The Game of Collective Intelligence (GCI) will include functions to help with the gathering and formatting of data, visual modeling, and interactive simulation. Using the information provided, the GCI will send the interested communities, as in a mirror, an explorable and reflective image of their collective intelligence. This image will give them some indication of the problems to be resolved (since the form of any collective intelligence has an intimate relation to its landscape of problems), and it will help the community to perfect their models of intellectual cooperation and to balance their cultural ecosystems. Of the many factors that figure in its composition, the model proposed here below, as will become apparent, assigns an important place to reflexivity, in other words, the information and ideas (organized in a coherent way) *which impact the cognitive functioning of the community in question.* The construction and the free Internet access to the GCI aims to contribute to a better "self-knowledge" of the communities that wish

to commit themselves to the adventure of cognitive self-transformation. Furthermore, the software—which as its name indicates is the platform for a "game of collective intelligence"—should encourage the apprenticeship of a strategic thinking adapted to a society of highly complex knowledge in the grips of globalization and rapid change. The use of this software would follow these steps:

1. gathering the data concerning the economy of the knowledge of a community (plotting one's "position");
2. supplying the computer model with data so as to obtain a mapping of the structure and the position of the collective intelligence of this community (transfer its position onto the "map");
3. using this structure and singular position, the GCI will be able to simulate the different scenarios of the community's evolution of ideas toward an increase in collective intelligence (the "compass" points "north"). These simulations are meant to give pertinent indications as to the course to be followed in order to progress—in each different situation—toward an increase in collective intelligence.

In the GCI, ideas are represented by dynamic ideograms. These ideograms each have a characteristic visual image and are affected, according to their definitions, at specific zones of semantic space. They also have their own behavior allowing them to interact with one another, to combine, reproduce, and evolve in concert according to defined rules. Together the ideograms compose—on one hand—a language of animated images capable of *figuring* the infinitely varied facets of the universe of collective intelligence, and—on the other hand—they compose an instrument to simulate the ecology of ideas (or cognitive economies). Here, linguistic usage is an act, in other words, an event that has its origin in the intentions, knowledge and expertise of the agents intervening to particular ends, by manipulating symbols, in the given situation. The game will be able to suggest orientations for real agents, or simply indicate the easily foreseeable bad consequences of certain "moves." What is more, as a pedagogical exercise or just for fun, players will be able to go up against the computer and improve their proficiency in "the strategy of collective intelligence."

Translated from the French by Michael Taormina

---

http://www.collectiveintelligence.info/documents/0-REF-CI.doc
http://www.collectiveintelligence.info/documents/03-CIN.doc
http://www.collectiveintelligence.info/documents/Research-Outline-07-05-03.doc
http://www.collectiveintelligence.info/documents/02-FRENCH-JEU.doc
http://switch.sjsu.edu/~switch/nextswitch/switch_engine/front/front.php?artc=280
http://www.collectiveintelligence.info/documents/CI-THEORY-1.ppt
http://www.collectiveintelligence.info/documents/CI-THEORY-2.ppt
http://www.collectiveintelligence.info/documents/CI-THEORY-3.ppt
http://www.collectiveintelligence.info/documents/CI-THEORY-4.ppt
http://www.collectiveintelligence.info/documents/CI-THEORY-5.ppt
http://www.collectiveintelligence.info/documents/MOA-DATABASE.ppt
http://www.collectiveintelligence.info/documents/PLAYGROUND.ppt