

COLLECTIVE INTELLIGENCE IS A COMMONS THAT NEEDS PROTECTION AND A DEDICATED LANGUAGE



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After studying entrepreneurship at HEC in Paris she specialized in small and medium enterprise and created a niche speciality at the intersection of strategy, branding and organizational development. She worked in the waste management and consumer product industry, for business-to-business marketing consultancies, as an independent consultant specializing in innovation, IT and prospective, as well as in education and social development. From brand positioning, culture and strategy she moved to organizational change and cross-cultural collaboration and now focuses on social change, networks and movements.

INTRODUCTION

WE SPEAK OF COLLECTIVE INTELLIGENCE AS the capacity by which we can achieve more together than we can alone.

There are many definitions and narratives of collective intelligence, many ways collective intelligence is thought to form and manifest, many contexts in which it is invoked. Here are a few, jumbled up.

Collective intelligence arises, as a network of trust, from the empathy, the love and the compassion we have for each other. It is found in the synergy of cognition and skills that enables us to achieve great things when we collaborate. We see it at work in the responsibility we grant ourselves for stewarding the Earth that we have in custody. It manifests when the individual powers that enable us to take our destinies in our own hands aggregate into a collective power to change the world and take part in our shared evolution. We describe it as the global brain formed by the

distributed intelligence of our interconnected human minds operating as a neural network, embodied in Chardin's Noosphere. We see it also as the symbiotic connection between all living beings epitomized in Lovelock's Gaia Hypothesis, each of us united through the wider system of things, with a role to play in the greater order of the universe.

COLLECTIVE INTELLIGENCE AUGMENTED BY TECHNOLOGY, A CRESCENDO

There has been a crescendo through time in our capacity to individuate and to interconnect, in the scope of our collective intelligence and in the potential we see in it, augmented by technology.

Internet and digital technologies have given us access to a whole wealth of knowledge and to writing capabilities that we could never have dreamt of just a few decades earlier. New possibilities opened up, to author and share our own stories and the knowledge we produced with the world, and to discuss and make sense of these stories with our peers and beyond. By further multiplying the capacities to learn, produce, share, and dialog remotely we acquired with alphabetical writing and subsequently the printing press, information technology has undoubtedly accelerated our capacity for collaboration and action.

But how fit are we for leveraging our collective transformative potential and generating polycentric coherence at the systemic level? What role can digital technologies and automation play in helping achieve the promise of collective intelligence, and what are the challenges we face?

AN ECOLOGY FOR TRANSFORMATIVE ACTION, THE BEDROCK FOR COLLECTIVE INTELLIGENCE

In 'An ecology for transformative action', article published in the previous issue of the *Spanda Journal*, I described the complementarity of the diverse logics that drive change agents' engagement and actions, and how agency could be leveraged across the board to bring about systemic change, provided we found ways to coalesce rather than dilute the diversity of our efforts, and avoided the temptation to 'fuse' our identities.

We are all different, not only culturally but also cognitively, as illustrated by the varieties of ways in which we perceive and process information, and make decisions. These differences nurture our collective strength because they provide a fertile and diverse ground from which synergetic effects can emerge. They are our weakness too, because of the difficulties we experience to understand each other when we speak different languages and see reality through different lenses. We gather by affinity in communities of practice around social objects, i.e., the objects we choose to focus our caring attention and our efforts on, which may be people, places, issues, resources, processes, or desired outcomes. Social objects act as attractors and centres of shared values, goals, action and experience. Collective intelligence has always existed within these centres as an essential outcome and at the same time an enabler of the co-individuation process that occurs as people interact, and as they construct their own representations of reality, shared meaning making schemes, preferred story and process narratives, and associated language, by which they reduce the perceived complexity of their own context. We call this culture.

HOW WE PROCESS THE INFORMATION THAT SHAPES OUR UNDERSTANDING

When individuals learn or interact, what they perceive and remember from their lived experience creates imprints at various levels in their individual and collective minds. Stiegler distinguishes three types of imprints he calls retentions. Primary retentions are the most salient of our perceptions that we select from moment to moment and that combine in the flow of our consciousness. This flow enriches the memories of our experiences, i.e., our secondary retentions that act as the filters or frame of reference through which we select our primary retentions and categorize what we perceive in a feedback loop.

Vocabularies specific to communities of shared practice and experience derive from shared secondary retentions and the practice of shared categorization and interpretation.

Tertiary retentions are the layers of conscious and unconscious sedimentations as externalized tracks of collective knowledge and memory accumulated through shared practice and experience and transmitted across generations.

In addition to differences in what we focus our attention on and the filters we use to process what we retain, differences in how we mentally select and process information also play an important role.

What we perceive is categorized, interpreted and reconstructed in relation to what we know and how we understand. Understanding is the process of perceiving and categorizing. What we know is what we have understood. Interpreting is how we process and make sense of what we have understood, individually and collectively.

As part of his work on psychological types, Jung distinguished the four mental functions of sensation, intuition, thinking and feeling and the two attitude types of introversion and extraversion that differentiate cognitive processing preferences of individuals, and the dynamics by which they operate. We focus our attention and gather information (i.e., select our primary retentions) with a variable propensity for sensing or intuiting (the perceiving functions), and we organize our experiences and make decisions (i.e., categorize via our secondary retentions) with a variable propensity for thinking or feeling (the judging – interpretative functions). These functions play out predominantly for each of us either in the ‘introverted’ inner world of our thoughts, feeling, memories and imagination, or in the ‘extraverted’ outer world of actions, people, tools and organization.

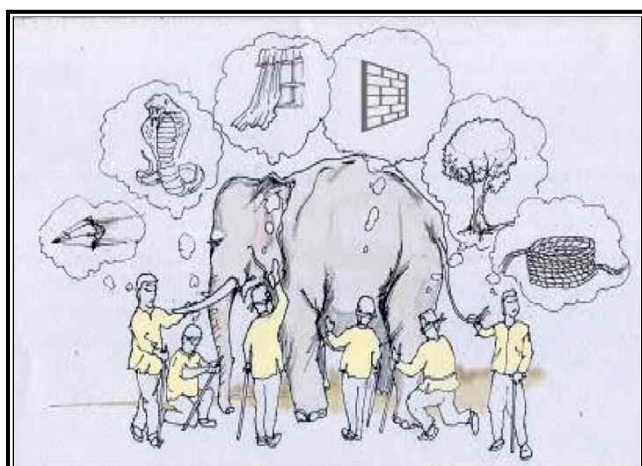
Individuals perceive and interpret experience differently as a result of different combination of mental functions and different individual and collective retentions, with variable inclinations for exploration and ways of integrating the new. New signals that we cannot categorize and interpret because we cannot relate them to anything we know individually or collectively may be left out unseen or perceived as threats. This may hinder our capacity as individuals or groups to understand, recognize and relate to logics that we are not familiar with.

The range of cognitive processing types of a group emerges from a combination of individuals’ processes at wider scales. Acknowledging and leveraging the complementarity of individual cognitive processes helps maximize cognitive effectiveness of a group.

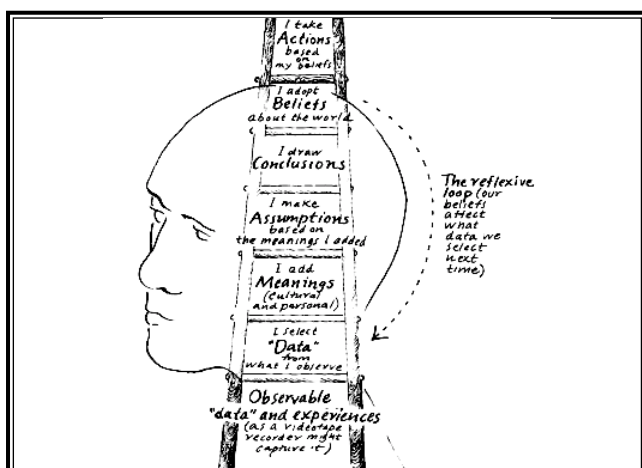
Achieving cognitive understanding within a cohesive group logic is easier than achieving cultural understanding across logics, which Stiegler calls regions of the logos or relational disciplines. These can be perceived as islands, and collective intelligence as the bridges that connect them.

SHARED DISCOVERY AND MUTUAL RECOGNITION

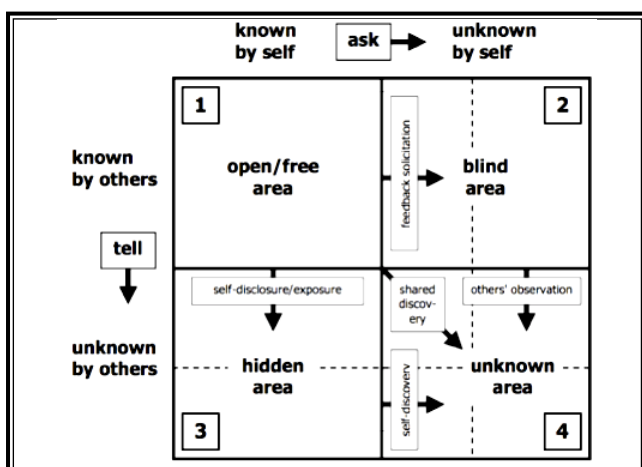
The need for coordination arises because we are different. Disregarding our differences will prevent us from ever perceiving what each of us alone cannot perceive.



The Ancient Indian Fable of the Blind Men and the Elephant
 [Source: <http://blog.practicalsanskrit.com>].



The Ladder of Inference [Source: Peter Senge, *The Fifth Discipline*].



The Johari Window - © Alan Chapman 2003 [<http://www.businessballs.com>].

In the ancient Indian fable of the elephant and the blind men, each blind man senses a different texture and imagines a different object. Individually, the blind men cannot make sense of the whole elephant. It is only when there is effective communication among them, recognizing that they will necessarily perceive different things depending on where they are and what they sense and intuit, that they can begin to realize what that beast really is.

The challenge is to bring the reality or the possibility of the elephant into each part, so that it is the elephant that materializes as a whole when all pieces are described, and not a set of unrelated parts. This is what collective intelligence must achieve. This means that we must invoke at the same time what we know, and what we may be individually missing. What it takes to find the complementary shapes one thing can use with others to build new things involves exploration and questioning, a playful mind and approach that helps us let go of our limiting assumptions and open up our minds for the unknown.

Argyris' Ladder of Inference reminds us that our assumptions are formed through the meaning we derive (via our secondary retentions) from the data we select out of real observable data and experiences (our primary retentions), which are our own interpretations of reality. What we infer may be biased by the selection we make and by the reinforcing effect of our assumptions on our beliefs in a feedback loop. Double loop learning and walking each other through our respective thinking, feeling, sensing, intuiting processes and frames of reference can help us discover and connect our respective interpretations and draw a broader picture of reality. The Johari Window opens up on self-awareness and shared discovery of the unknown, to expand the boundaries of what we can perceive and categorize, i.e. understand.

COLLECTIVE INTELLIGENCE
 BECOMING AWARE OF
 ITSELF

When we learn and experience new things we discover and integrate new categories that expand our secondary retentions and the range of what we are able to perceive. In

dialog with others, our frames of reference enrich each other, we co-individuate in a more or less convergent way. Trans-individuation occurs when both the individual and the collective are transformed through one another, akin to evolution of collective or group consciousness, all boats rising at once from where they are situated. That's when minds open for sparks to circulate and collide, creating new possibilities and opportunities for the ongoing thriving and regeneration of the system.

Internet has increased our capacity to reach out or cross over to other groups, it has made easier for the explorers in each group to cross boundaries and cross-pollinate, bringing and weaving the new into their respective groups. It has created opportunities for people and groups to swarm in informal networks, and enabled on-going conversations across groups to allow for multiple-level synchronizations to occur. Change agents and innovators are increasingly aware of the need to coordinate beyond their own perimeters of action, to operate synergies across movements outside of institutional coordination bodies. Calls to create networks of networks, movements of movements, global citizen movements, great transitions, big-shifts are multiplying. This is collective intelligence becoming aware of itself and calling itself to action.

The temptation is great however to think one can easily 'coordinate' global action across movements by building cohesiveness and convergence. "Just develop a shared vision" we hear often, "and build a plan or get self-organized from there". But trying to reduce to a common denominator, to align or to merge deeply imprinted and differentiated frameworks of understanding and interpretation does not work. You cannot deal with multiple centres operating on differentiated logics as you deal with cohesive ones. How can shared visions and roadmaps be developed when the parties do not share similar understandings of reality and projections of the future, when they do not speak the same language and when they may be shaped by their own assumptions? We must deal with a polycentric world. With no systemic centre, no 'central logic', no 'global eminent position' or legitimate vantage point in the system that would allow a global view and a synthesis between approaches, coordination is left to the various groups all acting as individual centres, to find coherence. This difficulty to find coherence was typically a problem brought up by organizers of the Occupy movement for example.

The mobilization of collective intelligence at wider systemic levels beyond the boundaries of our habitual communities to solve wicked interconnected problems involves more complex mechanisms and

in particular the capacity to achieve more complex synergies (i.e., systemic coherence) across multiple centres in addition to 'simple' local synthesis (i.e. complexity reductions) within cohesive centres of shared experience.

This requires an expansion of our capacities to meaningfully relate to each other, to understand our position in the bigger picture, to perceive and mutually recognize our respective logics and space for engagement, and to find and interpret the signals and tracks our actions leave in the system and the environment as feedback and feedforward that will inform further interpretation and action.

Achieving coherence involves tools and processes that can facilitate self-coordination of multiple approaches at many levels and scales, in addition to building cohesion through facilitation methodologies within defined contexts.

REVEALED AND AUGMENTED BY TECHNOLOGY

The multitude of pathways humanity engages into to make the world a better place are a manifestation of collective intelligence, not yet aware of itself, as illustrated by this quote of Edgar Morin in *La Voie*: "On each continent and in each nation one can find creative bubbling, a multitude of political initiatives in the direction of economic, social, political, cognitive, educational, ethical or existential regeneration. But everything that must be connected is yet dispersed, compartmented, separated. These initiatives are not aware of each other, no institution enumerates them, and no one is familiar with them. They are nonetheless the livestock for the future. It is now a matter of recognizing, aggregating, enlisting them in order to open up transformational paths. These multiple paths jointly developing will intermesh to form a new Path which will decompose into the paths each of us will follow and which will guide us toward the still invisible and unconceivable metamorphosis." (Tr. Finidori).

The tracks are there. How can we find and interpret them? Operationalizing collective intelligence involves being able to see the diversity of transformations at play and evolution in the making, how we contribute to this process, and where it is taking us.

Exponential computation power and visualization tools allow real time presentation of globalized data. Location and behaviour tracking tools, the Internet of things and mobile technology enable the harvesting of the micro-local and the connection of micro and macro levels.

Technology now has the potential to show how each individual action and story contributes to the

global outcome or picture and has an impact; and vice versa, how large transformations, or large outcomes are made of combined individual actions or items. A catalyst for agency.

Tools that can show us the dynamics of our system and the tracks we leave in it, that can help us discern and discuss how our behaviours aggregate and impact the system, technologies that can act as a mirror for our own actions and map out what we chart together in collaborative or self-coordinated ways all have the capacity to bolster collective intelligence because they provide the individual and collective feedback that will impulse our next individual and collective actions. The semantic web and the decentralization of the web offer a promising potential to achieve this through peer-to-peer connections.

THE MEDIUM SHAPES THE AGENT

Our actions shape the tracks we leave in our environment which in return inform our next actions. This is not without implications. A key question is what we want our mirrors to be, how distributed, differentiated and resilient they are, and who is susceptible of controlling them.

In his research on stigmergy and the Global Brain, Francis Heylighen describes how the environment he calls the medium is shaped by agents as their tracks aggregate and consolidate, up to a point where the medium becomes the mediator that directs the agents. The pheromone trace for example, that ants leave on the ground for others to find their way to food sources, attracts growing numbers of ants as the pheromone signal strengthens with traffic. Similarly, cross-country trails that start as barely distinguishable walk-paths make themselves more visible as people travel them. Eventually they become persistent roads and highways that funnel all traffic. The medium develops intelligent management of the communication process, as Heylighen notes, which retains the fittest and most useful pathways, while the others are abandoned.

Heylighen compares this selection process to that of neural connections that continuously develop when exercised, while those who don't are atrophied. This is indeed what determines our various retentions, how our memories discard what no longer is in use, and how specialized capabilities develop. Individuals have the ability however to choose which neural paths they exercise, and they may decide to cultivate fewer or more of their latent potentials. Groups may choose to develop complementary skill sets among their

members to anticipate future needs. Collective intelligence is about unleashing humanity's whole latent potential and turning it into action. If some neural pathways become or remain atrophied, possibilities become scarcer... Wouldn't a global brain want to exercise all of its neural pathways to keep the plasticity and alertness necessary for its own long-term adaptability and fitness?

When the most travelled roads, at a certain point, solidify as the dominant infrastructure, they may become difficult to escape from. This is when, in more general terms, norms and structures take control over agency and choice.

The threat of most travelled routes remaining mechanically the most travelled is a point I raise quite often. In an article in the last issue of the journal, I suggest that our institutions are systematically dysfunctional and our system as a whole at risk because we get trapped in positive feedback mechanisms that keep channelling behaviours towards the same pathways with little consideration for diversity and resilience, and how effects accumulate in time. We see these mechanisms at work for example in the network effect that builds monopolies when critical thresholds of audiences are reached, or in economics when winning strategies over-attract massive monoculture behaviour, generating volatile and brittle situations and outcomes. When a behaviour or a strategy is acknowledged as the fittest it becomes a best practice, a benchmark, a standard, an institutionalized model, embedded in the code, sometimes physically, in the form of an algorithm that remains hidden from view in a black box. The rate of application of such winning or fittest strategy, rather than the outcome it produces, becomes the criterion for performance. And there are no embedded mechanisms to evaluate whether it remains fit for purpose through time.

The difficulty to undo what has become solidified into structure or coded into algorithm is what makes us different from ants. When the food source starts to dry up ants seek new sources and the pheromone track dissipates leaving room for new pathways to emerge. Human tracks are more persistent... As suggested by Heylighen, positive feedback that characterizes goal oriented stigmergy is a great driver for both action and outcome. This however only applies to the point when the continued feedback destroys the function of the medium and endangers the whole system.

When we add the time factor, we realize it is not only the medium, i.e., the space, that controls the agent but a series of invisible power dynamics that alter the nature of the track and the medium itself, locking the agents in it. These dynamics cannot dissipate if they are not made visible, monitored for fitness and challenged over time.

This situation poses great threat to the system as a whole precisely because it is a threat to collective intelligence. Several risks are accumulating here. First is the control power conferred to those who own and maintain the infrastructure and attraction mechanisms that enable the enclosure and lock in of huge portions of collective intelligence. Second is the surveillance and the mining of collective intelligence for the benefit of the few rather than of collective intelligence itself. Third is the manipulation of collective intelligence into herd behaviour and preselected choice to the detriment of scope and variety, with the risk of nipping collective intelligence ‘in the bud’ and preventing it to achieve its promises.

OUR COLLECTIVE INTELLIGENCE, PRIVATIZED

Preserving the World Wide Web, the medium or mediator and manager par excellence of our free (i.e., *libre*) peer-to-peer communication processes, from the fate of the traditional media, owned by the few to serve private interests is the challenge we face.

The world wide web was initially built in 1989 to advance the diffusion of knowledge and collective intelligence. And it has unlocked great opportunities and expectations for self-realization and collective accomplishment over the years. In 2005 David de Ugarte envisioned the beginning of a veritable “reconquest of information and the imaginary as collective and de-merchandised creations”. Alongside the fully decentralized blogosphere that would enable the redistribution of informative power among equipotential citizens, he foresaw, albeit with some reservation, the proliferation of pluriar-chic, polycentric networks, able to provide abundance thanks to network effects. He called the new kinds of monopolists such as Google Internet Mumis in reference to ancient benevolent social animators of the Solomon Islands who prepared communal feasts for the followers they attracted. These Internet Mumis although centralized in their structure were meant to provide highly decentralized and diversified experiences to their volatile and demanding member base for free, generating new kinds of abundance. This remains the current ultimate promise of the platform model, which prompted PayPal founder Peter Thiel to praise monopolies as drivers of progress because the prospective of years or even decades of monopoly profits free of competition provides a powerful incentive to innovate and offer the best possible experience to their users. Out with competition, blue ocean strategy at its best! Ugarte’s conjectures were before the advent of Facebook, and

the propulsion of Google at the apex of monetization of our tracks. Now, lock in effects are engineered via massive VC investment that expect no returns before a status of monopoly is attained. Google purchases robotic startups at a blistering pace, half a dozen within a year, most of which involved in defence...

Many signs show that the web itself is now gradually being controlled by higher national purposes or private interests as Snowden’s revelations on NSA surveillance, the threats on net neutrality, and the constant erosion of privacy and Internet freedoms can attest. The web is being owned by what Michel Bauwens calls the netarchy, the giant platforms that both enable and exploit the participatory networks that arise from peer-to-peer activity.

Generating convenience and the illusion of freedom and abundance for free needs funding, and it seems that in their pursuit of enabling the multitude, the giants of the web have sold their souls to the devil, and we, the multitude, have sold our souls to them. We are now trapped within the walled gardens of gigantic platforms to which we contractually abandon our privacy rights and the tracks of our activity, in exchange for free access to the tools that enable us to produce the tracks...

OUR COLLECTIVE INTELLIGENCE, AN OBJECT OF SURVEILLANCE

From agents of collective intelligence, we are becoming objects of the intelligence, through manipulation and surveillance. Our tracks are recorded, collected and aggregated through cookies by each service and application we use. Our individual and collective behaviours are made available to state intelligence, statisticians, marketers, technologists and scientists, while our access to the data we generate is local and limited. How easy is it indeed for us to search elements of our own past and retrieve the content we generated on social networks?

We are told our tracks are disseminated and anonymous, yet so easily reconstructed via correlations, and in our face! When I book an airplane ticket directly from an airline’s website, an advertisement appears on Google or Facebook for a car rental or a hotel in my destination city. When I look up an illness on Google I get an advertorial for a treatment or a clinic on Facebook. When my husband watches a sports event on my computer, I receive spams for young chick dates... How difficult is it for any of these platforms and their partners to relate this to my profile or my IP, and identify all my whereabouts, concerns, and potential addictions and contradictions? We saw

recently how Uber employees tracked identified VIP customers in real time on giant screens, and how one of their VPs threatened to ‘dig up dirt’ on journalists that criticized some tactics. Big Brother is watching us, an omnipresent ‘Intelligence system’ that caters too much more than national or international security interests.

OUR COLLECTIVE INTELLIGENCE, MANIPULATED

Our traces are analyzed in order to anticipate and affect any of our possible behaviours. The more we use platform services, the more the various algorithms at work learn about us for a ‘tailored’ experience. Our tracks are used to lure our attention, move us into action, and make the most out of us not only through straight forward advertisement but also through more refined techniques such as clickbaits, pushed selections, or dynamic pricing. This ranges from prices for a given flight increased at each visit, all other things remaining equal, to create some urgency for purchase, to the display of higher price selections based on estimated purchase power, such as Orbitz proposing more expensive hotel rooms to Apple OS users found to spend 30% more on hotels than windows users. Platforms are an excellent playground to test new algorithms. Uber’s pricing algorithm has recently been praised by MIT tech review as its best innovation.

Differentiation and self-realization were the promise of the web, but we are manipulated into convergence. Our choices are inspired by algorithms that serve us what our friends, our passed behaviours and possible addictions, or other purchase pattern and popularity statistics would suggest. Statistically generated Amazon book recommendations or Google AdSense generated search suggestions feed back into themselves and skew the statistics, triggering self-generated winner takes all positive feedback loops that impoverish choice even more at each round. Similarly, the reuse of machine-generated language that feeds back into Google Translate’s corpus as original material depletes the corpus originating initially from real translators’ work. A concern for Google itself, referred to as ‘polluting its own drinking water’, which caused the shutdown of Google Translate API.

OUR COLLECTIVE INTELLIGENCE, DIVERTED

What was expected to liberate us from all forms of enslavement is now keeping us captive as objects of an experiment. We are lulled in a fishbowl, kept in a bubble that slows our collective evolution...

Are we being bitten back even harder by what we have been trying to get away from for decades?

Adam Curtis in his ‘Century of the self’ BBC documentary series masterfully depicted how psychological techniques had been used throughout the 20th century to read, create and fulfil the desires of the public, and to make products and ideas as attractive as possible to consumers and citizens. In ‘All watched over by machines of loving grace’ he showed how key strands of thought that shaped the 20th century ethos had caused us to embrace a fatalistic philosophy that sees human beings as cogs in a mechanistic system, as computing machines in their own right, or as biologic organisms driven by their genes, helpless and disillusioned in the face of those in power, with no idea of what comes next or of how to challenge and change the status quo. The web was meant to remedy all this. How far have we drifted away from the promise of what could be unlocked by putting to good use what Clay Shirky called our cognitive surplus: the time that we gained back from watching TV? Stiegler likes to evoke systemic stupidity as time of available brain accessible to those who try and manipulate us. This quote of the CEO of a major French TV channel is indeed memorable.

« There are many ways of talking about television. But in a business context, let’s be realistic: basically, TF1’s job is to help Coca-cola, for example, to sell its product [...]. However, for an advertisement to be perceived, it is necessary that the brain of the spectator should be available. The role of our programs is to make it available: i.e. to entertain it, to relax it in order to prepare it between two messages. What we sell to Coca-cola is some time of available human brain [...]. Nothing is more difficult than obtaining this availability. There lies the permanent challenge. It is necessary to seek at all times the programs that will fit, to follow the latest fashions, to surf on the trends of the moment, in a context where information accelerates, multiplies and gets more pervasive ». Patrick Le Lay (Tr. Bruno, C.).

We are caught in a Faustian bind. On the one hand we are seduced by the convenience of the tools that enable us to make our voices heard and to connect and exchange with the world. On the other hand, we are under the microscope, we hardly benefit from the insights this aggregated data could provide us, and we remain at the merci of various forms of stimulations based on projections that keep us captive of our existing habits and anticipated desires, and nudge us towards sameness.

RECLAIMING OUR COLLECTIVE INTELLIGENCE

MIT’s Center for Collective Intelligence director Tom Malone also is concerned by the conditions

under which collective intelligence can overcome collective stupidity that he defines as herd behaviour or groupthink, with a fine line to draw between the two. He frames the question pertaining to collective intelligence research in the following terms: *How can people and computers be connected so that – collectively – they act more intelligently than any person, group or computer has ever done before?*”

For Stiegler any technology is potentially disruptive and toxic. Digital technologies as automation techniques constitute a *pharmakon*. A *pharmakon* like any remedy can save a patient or kill him if mishandled or overdosed. It is potentially curative and beneficial, or dangerous if not implemented according to specific requirements. A *pharmakon* as defined in Plato’s *Phaedrus* dialogues is what produces an extension of knowledge and capabilities into an external milieu that can be manipulated.

Collective intelligence is the manipulated matter, and also the safeguard against manipulation. To ensure its own survival and long-term thriving, collective intelligence must focus above all on preserving and enhancing the opportunities provided by digital technologies and the web for its own coalescence. It must strive to maintain the integrity of its collective perceiving and interpreting functions, and be aware of the risks of its being absorbed and annihilated by all kinds of manipulators often referred to as ‘the system’ itself because of the systems dynamics they may initiate or perpetuate, through the manipulation of retentions and behaviours.

It is critical that ‘we the people’ reclaim the ownership of the web and the control of our stigmergetic processes as commons or public goods before it is too late. The capacity for analysis and interpretation of the dynamics that affect our behaviours, and the tracks they leave in the environment must be kept free of all manipulation and protected as an instrument for collective intelligence to help us ‘better ourselves’ and enhance our collective problem solving capacity.

People increasingly assemble and reassemble ad hoc in networks of networks, around specific projects that are usually issues based. Gated platforms, which enclose their users under leonine terms and conditions are unsuitable to the context of fluid collaboration in variable geometries, whose ground is the web itself.

We need a web that empowers new forms of connections and interactions across boundaries to allow the creation of virtual spaces where projects, people, ideas, and resources distributed in various contexts can be ‘pulled’ to accomplish specific tasks and generate productive conversations leading to action. This involves a distributed web, with portable identities, privacy protection

systems, as well as protection against cyber attacks and fraud. It also requires tools and methodologies to develop understanding and interpretation of systemic phenomena and patterns of behaviours, as well as mutual understanding of the logics under which various community of experience operate, to enable collective interpretations.

Open source communities, the World Wide Web Consortium (W3C), in charge of web standards and protocols, and other organizations are working to build empowering tools. Most resources however are allocated to technologies that are being developed behind closed doors.

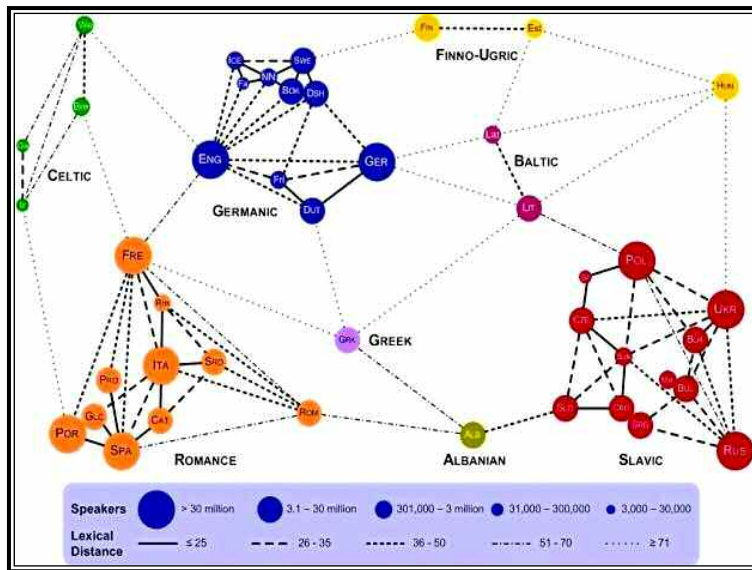
TOOLS FOR STIGMERGETIC VISUALIZATION

Tools and methodologies that enable visualization and interpretation of stigmergetic feedback at various levels and scales, where possibilities can be explored, gaps identified, needs fulfilled, and impacts assessed, enabling agency to apply itself effectively, would be particularly useful. Here are some examples and visions.

At the micro level, Bret Victor suggests the creation of environments that nurture ideas, where we could see what is produced, at work, in its context, while it is produced. As creators we need an immediate connection to what we create, to see the effect of our changes immediately. We need to find new medium that can “listen to our hands as we create”, so that we can unlock the pieces that are locked in our heads and nurture the ideas that must be grown, individually and collectively. To illustrate this in practice Victor created a program that shows the immediate rendering of code as it is programmed. In a similar line, Olivier Auber’s Poietic Generator aggregates side-by-side drawings from multiple connected users, making the collective picture that continuously emerges visible to all in real time, as it is created.

At the macro-level, Jean François Noubel introduced the concept of holopticism where “each player, thanks to his/her experience and expertise, relates to the whole in order to adjust his/her actions and coordinate them with others’ moves. Therefore there is an unceasing round trip, a feedback loop that works like a mirror between the individual level and the collective one.”

With anopticism, Olivier Auber brings the nuance that there is also always an invisible architecture, which influences and determines our behavioural choices. Anopticism questions the idea of totality of a space and of objectivity of its representation, insisting instead on the arbitrary and subjectivity of the many points of view of which everyone is potentially an author, and the actor of the rules and codes



Lexical distance among the languages of Europe [http://bit.ly/1lub511].

they generate. It postulates that the collective intelligence of a group can develop only when each member of the group has access to at least one form of representation of the group’s activity, when this representation is considered legitimate by everyone, and when each member can situate him/herself in this representation and can therefore change his/her situation through action.

Both the holoptic and the anoptic systems are a modelled representation of the space in which the actors evolve, which involves dealing with intersubjectivity and the connections between representations, in opposition to Foucault’s Panopticon where one agent observes all the others without their knowing (the situation we are increasingly finding ourselves in right now on private platforms).

In a poetic intervention, Bracha Ettinger talks of borderspaces at the junction of things, of borderlinks created via fluctuation of distance in proximity to create relations without relationships, where different Is and non-Is co-emerge, and are transformed, sharing new and old, by imprinting and engraving their traces in shareable threads, creating trans-subjective relationships.

Linked data and the semantic web would enable navigation of this in between possibility space, bringing to life the ‘adjacent possible’ proposed by Stuart Kaufman: *“The strange and beautiful truth about the adjacent possible is that its boundaries grow as you explore them. Each new combination opens up the possibility of other new combinations. Think of it as a house that magically expands with each door you open. You begin in a room with four doors, each leading to a new room that you haven’t visited yet. Once you*

open one of those doors and stroll into that room, three new doors appear, each leading to a brand-new room that you couldn’t have reached from your original starting point. Keep opening new doors and eventually you’ll have built a palace.” Steve Johnson.

Imagine if our various logics, vocabularies, and narratives, what Stiegler calls the regions of the logos could be mapped by degree of familiarity or closeness with each other, creating an impressionistic map of the possibility domain, where people could explore the unknown from what is familiar, and navigate by successive hops through our traces from one possibility to another to find

meaning in the unknown and discover new worlds and broaden horizons, in productive debates and conversations.

DISTRIBUTED SPACES FOR CONVERSATION, CURATION AND ACTION

The generative potential of conversations around social objects and issues that attract individual intentions into collective effort could be leveraged through emergent conversation-to-action spaces that support the harvesting and reprocessing of conversations directed towards argumentation, problem solving and action, i.e. learning by doing. EU funded project Catalyst is developing a suite of collective intelligence tools aimed at increasing the effectiveness of conversations, and support collective ideation, decision and action. Loomio focuses on collective decision making in ways that foster debate. These emergent conversations spaces should support tools to pull, visualize and navigate contextualized data such as described above, analyzed and interpreted with the support of pattern recognition methodologies and pattern languages. They should also be able to attract stakeholders and relevant parties into conversation or debate and action. A direction taken by the French Assemblée Virtuelle with the creation of ecosystems of actors, ideas, projects and resources, based on technologies of the semantic web. This fits John Hagel’s definition of the scalable pull platform “where we can draw out the people and resources that we need, when we need them and where we need them”.

Such emergent spaces would support the project of the Digital Studies research group working in

cooperation with the Institute for Research and Innovation (IRI) at the Center Georges Pompidou in Paris and the W3C chaired by Tim Berners Lee, founder of the web, to reinstate the web as a distributed space for hermeneutics and controversy with protocols, standards for annotation and new forms of semantic based queries where contributive communities would act as guardians of collective intelligence.

On a similar note Howard Reingold suggests the institution of communities of curators of the web, with variety of roles, to improve our ability to use the web for our own good in particular for determining the validity, legitimacy of information.

THE LANGUAGE OF COLLECTIVE INTELLIGENCE

Gaining more insight on the dynamics at play in the system beyond the evaluation of spatial tracks and status of the system, is critical. In particular we need to acquire capabilities to examine the dynamics that lock us into structures that are unfit and detrimental to the thriving and renewal of the system through time. A language of collective intelligence could develop in the form of a web of pattern languages that could help make sense of situations and phenomena in various 'regions of the logos' and design appropriate solutions. A meta-pattern language (this denomination is not cast in bronze) could provide abstract elementary components as building blocks, common to 'local' interpretative languages. This meta-pattern language would concentrate on systemic phenomena and their effects in space and time, to help recognize and interpret our systemic tracks in dynamic ways, in connection with the data visualization and discovery tools described above.

A group of us is working to launch such meta-pattern language, as an open source visual language we called PLAST (pattern language for systemic transformation), based on systemic interpretation. The language is made of elementary components that will help decompose and recompose observed or intended patterns of systemic behaviour into 'human computable' sequences that can be probed, to evaluate possibilities. The goal is to design and monitor the dynamics we generate by our activity in a way that is regenerative of commons in their widest definition, as factors of thriving and renewal of the system.

We envision it as a symbolic code for sharing perceptions and interpretations of relations, effects and potentials, looking for tracks in what we 'observe' in the logic of our own realities and shared experiences, and in relation to higher levels of aggregation and

integration. Visuals allow direct representations of sequences and combinatory without the 'baggage', whether discipline-related, ideological, or cultural etc, that words can bring. It is a tool aimed at working across boundaries to generate discussions and debate on systemic phenomena and their effects and what can be done about them. The conception of the PLAST will be based on observations of dynamics and effects in different scenarios by communities of practice, contrasted and integrated with known and documented dynamics and effects from various disciplines such as Complexity theory and complexity economics, network theory, cognitive sciences, Systems Dynamics and Systems Thinking, Natural Systems, Mathematics, and more.

All these tools and applications of technology are ways of operationalizing collective intelligence towards the safeguard of our capacity as humans assisted by machines, but humans nonetheless, to perceive and interpret the tracks that we leave in the medium, and ensure the protection, the nurturing and the reproduction of the distributed factors of opportunity and of ongoing health and thriving of the system. Let's concentrate on building them in good collective intelligence!



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