Direct democracy as the keystone of smart city governance as a complex system

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Abstract: We consider the smart city not as an addition of « smarties » (technological devices) but as system capable of evolution all along its lifecycle. This cycle has been described as Urban Lifecycle Management (Rochet 2015) since a city never dies and must be able to reconfigure itself while its internal and external environment changes. Literature on cities as evolving ecosystems (Batty 2015) considers this evolutionary process can't be steered in top down way, either by a supra rational actor, or on a self-regulating basis as claimed by the authors of the first order cybernetics. Integrating all the components of this evolution in the context of iconomics (economics of the III° industrial revolution) we examine why direct democracy appears to be the best drivers for this regulation and what could be its underpinning collective future oriented sensemaking dynamics, through the case of a participatory collective re-design of a Technology Park by its actors in Casablanca, Morocco.

The recurrent problem appearing in the attempts to define smart cities is the understanding of how a smart city grows and evolves out of a sum of technological devices. Michael Batty's groundbreaking opus *The New Science of Cities* (2013) defines the challenge, in the line of thought of Jane Jacobs and Chris Alexander, as comprehending the city "as systems built more like organisms than machines", that is to say a network of flows. Consequently, if we want the city to be smart, we need to monitor the growth of the city and predicting its evolution with modeling tools up to the age of the digital economy. Consequently, we need to analyze the smart cities dynamics through the lens of complex systems architecture, to envisage which competencies, and specifically public ones, may be updated to take on this task of modeling. Following Batty and other complex systems scientists, the city aspiring to be smart is to be conceived from the bottom-up and no longer from the top down as it has been the rule until now in the tradition of urban planning, therefore putting emphasis on the role of the ordinary citizen as a key actor.

The smart city: a collection of smarties or a system?

Mainstream definition of smart cities, adopted by the European Union, relies on Giffinger categorization: a city is smart if she gathers "smart" characteristics: smart people, smart governance, smart transportation, smart buildings, smart economy, technology…. Basing on such criteria, EU accounts up to 240 smart cities in Europe! This approach is meaningless from a systemic point of view: we may have smart people working with cutting-edge technologies in BIM positive energy buildings, using trendy solar transportation cars, and producing a stupid system as a whole.
A smart city is more than the sum of "smarties" (smart grids, smart buildings, smart computing…) in spite we have no precise and operational definition of what a smart city is (Lizaroiu & Roscia, 2012). In the recent literature, the smart city tends to be defined as an ecosystem, that is to say a system where the whole is more than the sum of the parts and has *autopoeitic* properties (Neirotti et a., 2013, Batty, 2013).
What makes a system, and most of all an ecosystem, is integration. Integration is an *emergence*, that is a state

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August
2016

defined as a process which cannot be described by a fixed model, consisting of invariant distinctions. Hence emergence must be described by a metamodel, representing the transition of one model to another one by means of a distinction dynamic (Heylinghen, 1992). Literature on cities as evolving ecosystems (Batty 2015) considers this evolutionary process can't be steered in top down way or on a self-regulating basis as claimed by the authors of the first order cybernetics (Heylighen &Joslin, 1991).

Therefore, if we apply the law of requisite variety developed in the stream of complexity theories, we see clearly, as had stated Karl Weick (1995) that "*human thoughts and action (in the context of complex ecosystems) must be highly varied to grasp the variations in an ongoing flow of events*". In other words, for such a transition stated above to succeed at the scale of a social system (city, district, etc.), the metamodel and its underlying process must be "as complex as the system they (actors involved) intend to regulate" (Weick, 1987b).

The purpose of this paper is first to understand the basic tenets of complex adaptive system theory applied to the emerging field of smart city and its self-regulation dynamics, second to explore what kind of "complexity-enabled" process could be adapted to experiment direct democracy principles on a specific social system, using a combination of future oriented collective sensemaking recent theoretical developments (Stigliani & Ravasi 2012; Gephart, Topal, & Zhang, 2010; Gioia & Chittipeddi, 1991) and the emerging field of design thinking applied to smart cities (several examples driven by different contexts, motives and approach : Christchurch in New Zealand, Panama-city, Barcelona etc.).

How smart were the cities of the past?

The seminal *The City in History* by Lewis Mumford tells us cities of the past were self-evolving ecosystems obeying the laws of organic planning. Organic planning, as analyzed by Mumford has no preconceived objectives. It's a self-adaptive system which reinforce its coherence along time. The resulting pattern has not been foreseen beforehand but is strongly coherent and harmonious.
This evolution was made possible by a share common sense of beauty and of the ends of life in the city. One of the most salient traits of these towns is they were free merchant cities ruled by various forms of democracy, drawing from direct democracy (e. g. Veliki Novgorod) to complex mix regimes to preserve the equilibrium of powers among the few powerful and the many of citizens (e.g. Florence, Venice). Sense of the Common good, sense of harmony made these cities working as continuous problem solver, a learning system which reinforced its coherence along time.

As Mumford put it, the coherence of these cities was reinforced by the wall that we could call, in contemporary system language, the perimeter of the system which defines what is inside and outside the system. The relationships between the city and its periphery was organized as described at the beginning of the XIX° century by Von Thünen by concentric circles. But what made the success of the medieval town made its loss: the wall was fixed and the city appeared to be an open evolutionary system with the advent of the "death of distance", first with more secure roads and with the revolution of transportation by the middle of the XIX° century. With the appearance of networks of infrastructure technologies and the spread of the telegraph that transformed the government of the city, critical obstacles to the growth of cities were removed making the wall senseless. Today digital technologies amplify this move, providing new tools such as smart phones that became a digital Swiss knife that allows inhabitants to be active actors in the city life, communicating and coordinating with each other, using and feeding databases.

Cities as far from equilibrium adaptive systems

Growing cities began to be considered a system in the practice of urban planning that appeared formally in the 1950 to solve the problem of transportation between workplaces and housing, under the banner of "social physics", the utilitarian approach propelled by Stanley Jevons at the end of the XIX° century (Jevons, 1871) who considered economy ruled by the general laws of mechanics. These key ideas assumed the system was in equilibrium and might be regulated by single feedback loops according to the principles of first order cybernetics. This kind of model relied on spatial interaction for testing, e.g. how people might shift from one mode of transportation to another, as decided to solve the congestion in London in 2003 by charging car traffic, and predict the effect on global pollution, the growing density of the city to shorten the traffic between workplace and habitation.

But in the recent decades, since the 1980, the paradigm has changed fundamentally. In first order cybernetics, the system is centrally organized, in equilibrium, being able to return to its state of equilibrium after a perturbation – an equilibrium slightly different but not questioning the dominant pattern of the city. This kind of system is viewed as centrally organized and structured from the top down, as exemplified by Rio do Janeiro central control system built by IBM.

The development of second order cybernetics in the 1980 moved the structures and behaviors of the city toward a system being organized from the bottom up. These systems are in dynamic disequilibrium, notwithstanding that disequilibrium is not permanent since the system is undergoing to one state of equilibrium to another. Michael Batty has coined the expression "*far from equilibrium*" to describe this phenomenon (2016).

These systems are *adaptive* (Arthur, 1997) meaning that equilibrium is renewed from within through unanticipated innovations reacting unanticipated events. This is an *endogenous* evolutionary process, compared to the *exogenous* command and control process of the first order cybernetics. Here we find this kind of architecture without architects as described by Mumford in the case of the Middle-age city. The city is growing organically from the bottom-up. Christopher Alexander, in his seminal book on system architecture of cities *A Timeless Way of building* has given an iconic definition of organic growth, putting that "*quality in buildings and towns cannot be made, but only generated, indirectly, by the ordinary actions of the people, just as flower cannot be made but only generated from the seed* ».

This supposes that, like in biology, it exists some kind of genetic code that made the system self-regulating. In that case, asserts Alexander, this code is *« replaced by people conscientiousness of the larger scale patterns, which provides the rules of growth. If people have agreements about these larger scale patterns, then they can use their knowledge of the patterns, and the degree to which theses patterns have been attained, or not, to guide the growth and the assembly of the smaller patterns. Slowly, under the impact of this guidance, the sequence of small-scale transformations will, of its own accord, create the larger patterns, piece by piece: without any individual person necessarily knowing how or where these larger patterns will be in the finished town* » (1979).

To sum it up, the more the city as a system is confronted to as well endogenous as exogenous changes, the more it accumulates this « people consciousness » that allow new patterns to emerge. **The smartness of the city consists of this continuous learning process** that relies on interactions between basic cells and actors of the city. If the lessons of the middle-age city as an archetype of organic development that produced the smart city of that time, its failure was it was conceived as a closed system locked in behind the wall.

In the XIX° century, intents to reinvent such self-contained cities were made by utopians such as Ebenezer Howard in reaction to the unhealthy sprawling of industrial revolution cities. He thought of the smart city as an ideal city conceived from scratch as a mix of country and city. His insight was to conceive the city as an interaction between a city with jobs and opportunity, but with pollution, and the countryside with fresh air and cheap land, but with fewer opportunities, each one acting as magnets attracting and repelling people. He invented a third magnet, *the Garden city*, which combined the most attractive elements of both city and countryside (Howard, 1902). Garden city was the Songdo of its day (Townsend 2013) that galvanized architects, engineers and social planners in search of a rational and comprehensive approach of building city. Howard's approach was excoriated by Jane Jacobs in his *Death and Life of Great American Cities* (1961) for not giving room to real life: "*He conceived of good planning as a series of static acts; in each case the plan must anticipate all the needed… He was uninterested in the aspects of the city that could not be abstracted to serve his utopia*". As Dennis Hardy (1991) put it, Howard's garden cities were a quasi-utopia of a perfect city in an imperfect world (while communist and fascist utopias have dreamed of the city as a perfect city in a perfect world). Unable to evolve, the garden city dream, not relying on a global systemic architecture, has degenerated in the banal reality of suburban sprawl.

The same risk exists today with digital technologies, which could revive the ideal city dream, under the impulse of the big players such as Cisco, IBM, Siemens, GE … who have interest in a top-down and deterministic approach that reduce smart cities to the adoption of their "intelligent" technology.

What makes a city smart?

In their analysis of present smart cities initiative, Neirotti & a. (2013) notice that there is no practice that encompasses all the domains, hard and soft, of the cities. The most covered domains are hard ones: transportation and mobility, natural resources and energy. Government is the domain in which the cities report the lowest number of initiatives. More, in the present smart cities research program, there is an inverse correlation between investment in hard and soft domains, smart government being still the poor relative in smart cities initiatives, while cities that have invested in hard domains are not necessarily more livable cities. In fact, two models emerge from Neirotti & a. survey: one focused on technology (with a strong impetus of technology vendors) and another focused on soft aspects, the hard model being dominant. The problem is there are no vendors for soft domains apart the citizens themselves whereas systemic integration relies on soft domains, mainly taking in account the context and valuing social capital.

These approaches are dead ends, as analyzed by Adam Greenfield in his pamphlet *Against the Smart City* (2014). Promoted by vendors of technology, the ideology of the smart city is a techno-centric approach that rely on top down methodology that has produced the non-habitable cities of Songdo, Masdar, Plan IT valley… The pamphleteer Evgueny Morozov has excoriated this mood in his *To Save the World Click Here* as "solutionism" that we may sum up as "*My technology is the solution, so your problem is the one solved by my technology"*.

We might think of the city as an *adaptive* system which have the same internal coherence as the medieval city, but being opened to the turbulences of the external world, an archetype of a quasi-smart city of today being Singapore. A smart city as an **autopoietic ecosystem** must be designed as *an imperfect city in an imperfect world* able to reframe itself according to the evolution of its environment. Therefore, integration is not made once and for all but is a permanent process all along the urban lifecycle. A smart integration is made according the ends of the city and must be citizen centered and not techno centered. The "good life" is the basic question of political philosophy since Aristotle. It is an ethical issue that will result from political and strategic debates among the stakeholders.

An autopoietic system is "*a network of processes of production (transformation and destruction) of components which: (i) through their interactions and transformations continuously regenerate and realize the network of processes that produced them; and (ii) constitute it as a concrete unity in space in which they (the components) exist by specifying the topological domain of its realization as such a network." (*H. Maturana). Autopoiesis is a property of **human dissipative systems**: strong entropy and correlative capabilities to reproduce itself permanently thanks to its internal interactions. This property makes the system able to face with the rapid changes of the environment: *"This generalized view of autopoiesis considers systems as self-producing not in terms of their physical components, but in terms of its organization, which can be measured in terms of information and complexity. In other words, we can describe autopoietic systems as those producing more of their own complexity than the one produced by their environment*". (Gershenson, 2015)

As a result, urban system scale from local actions and interactions that lead to global patterns which can only be predict from the bottom-up (Miller, Page 2007). In this new view of the city being the result of emergent patterns, we will focus in this paper on the role of citizens and direct democracy as one of the models which take part of the global Urban Lifecycle Management (ULM, Rochet 2015).

Why do we need strong citizen based interactions within the urban system?

After the city of Christchurch (NZ) has been destroyed by an earthquake in 2011, the government of NZ proposed to rebuild the on a traditional top-down approach. The answer of Lianne Dailzel, the new elected mayor, was to rely on citizens' intelligence initiatives insisting on the fact that a resilient city able to withstand a shock as an earthquake needed to be built bottom-up mobilizing empirical mundane knowledge and creating the conditions to appropriate scientific knowledge.

The second reason to plead for bottom-up approaches is economy. An economic structure based on synergies on economics activities is the condition to wealth creation which reinforces itself through interaction of a political power based on the Common Good (Reinert, 2006, Rochet, 2012)

In the case of FFF (Failed, Fragile and Failing states) Kattel and Reinert (2009) note that "*State failure and fragility are often preceded, or at least accompanied, by failure and fragility of cities*". When a city sprawl out of control, it produces negative externalities without positive synergies. The missing link in the economics is related to the lack of increasing returns based on « *coopetitive » diffusion of means in a predictable and conducive environment. (…) productive governance often enforces the development sustainable productive structures based usually on a participatory system. **The more the participatory system is closed to democracy and shared economic growth with special focus on health, education and communication infrastructure building, more quickly the divergence between countries narrow down**.»* (Reinert &Kattel, 2009).

The third reason it the technological intensity of smart cities.

- Citizen is at the interface of technological devices which consume and produce data (e.g. The smart phone). The frontier between production and consumption is blurred more than in other cases of information economy (McLuhan). In a rapid innovative system, the citizen is a *lead user* of the innovation process (Von Hippel).
- The power of these technical systems requires strong political control to be both fully efficient and not becoming the level of a totalitarian system (Simondon).

Distributed sensemaking as a theoretical framework for a processual approach of direct democracy

As forces of globalization and innovation have raised the levels of cultural and technological diversity in our different social systems, including the cities, the ability to adapt to changing environments and the ability of individuals and groups to make good sense out of the situations that they participate in has become increasingly important. In such a context how can we organize bottom-up citizen centered innovation approaches that catalyze collective sense making at the scale of a given territory?

Distributed sensemaking and complexity

Such sensemaking (Weick, 1995) requires an appreciation of the highly tacit and distributed nature of knowledge involved as well as the complex, social practices through which such knowledge develops. Therefore, a natural link can be established between the previous developments on smart cities and the sense making perspective that allows to view organizations and more broadly, human groups (Weick 1995) as emergent phenomena or complex, adaptive systems (Cicmil et al., 2009; Stacey, 2001; Weick, 2005) that may evolve or learn in conjunction with environments that they in part create. Following Weick (2005), "*the ideas of complexity theory, when combined with those of sensemaking theory, provide a powerful combination to understand thick, dense events that have high stakes*" and therefore applying the Sensemaking perspective to the complexity of cities as emergent phenomena offers promising research opportunities.

Cities from the standpoint of their human and social constituencies, following previous developments, can be considered as "loosely coupled systems" (Weick, 2005). Therefore, in order to better adapt that image to complexity thinking, we can describe autopoietic cities as merging social orders where "*Groups composed of individuals with distributed-segmented, partial-images of a complex environment can, through interaction synthetically construct a representation of it that works; one which, in its interactive complexity, outstrips the capacity of any single individual in the network to represent and discriminate events […] Out of the interconnections, there emerges a representation of the world that none of those involved individually possessed or could possess*" (Taylor and Van Every, 2000).

The basic theme implied by this statement is that variations in interconnection produce variations in the representations that are synthetically constructed. In the case of direct democracy initiatives, gathering a broad set of individual / group contributions at its beginning, *"mere assembly does not guarantee meaning. Each part is meaningless until it is related to some other part whose meaning, in turn, is dependent on the meaning of the initial part. Making meaning is an iterative process"* (Weick, 2005). Stated differently, in a reactive world, a highly-refined planning system as is being used in the classical top down city development approaches, is less crucial than *"the capability to make sense out of an emerging pattern"* (Weick, 2005).

Relating these developments with our research question, how can we leverage distributed sensemaking concepts and practices to the complexity attributes of a cities viewed as autopoietic systems? In his 2005 book updating Sensemaking perspective, especially with regards distributed sensemaking viewed from the lens of complexity, Weick proposes equivalent statements linking between complexity themes and concepts from cognition, sensemaking, workflow interdependence, and interrelating. Weick's argument is that these substitutions retain the spirit of complexity analysis but customize those insights so that they better fit human groups enactment and organizing (Weick, 2005), which is at the core of direct democracy initiatives. We've synthetized these statements hereunder, and suggest that these equivalences might be a foundation for a processual approach for direct democracy action with cities or territories aiming to evolve as autopoietic systems.

Inspired from Weick, "Making sense of the organization - The impermanent organization, 2005" p. 56-61

Complexity based concepts	Sensemaking based concepts
Unknowability	partial connections that produce multiple realities
uncertainty as an issue of ontology	Uncertainty as an issue of epistemology.
Partial connections	distributed sensemaking, semi-independent agents, reciprocal reference, identities that hold agents together, loosely coupled systems
Chaos	ambivalence, equivocality, ambiguity, and the unexpected.
Emergence	becoming, organizing, and juxtapositions that force novel meaning
Dynamic	fluid, impermanent, process, ongoing, updating, exploration
Co-evolution	reciprocal enactment of both the organization and the environment
Self-organizing	organization that emerges IN communication
Simple rules applied locally	micro states that are central in organizing
Non-linear	deviation amplifying feedback and small actions that can have large consequences
Entropy	normalizing, codification, shareability constraints, labeling
Diversity	requisite variety, conflict, multiple drafts

Collective sensemaking

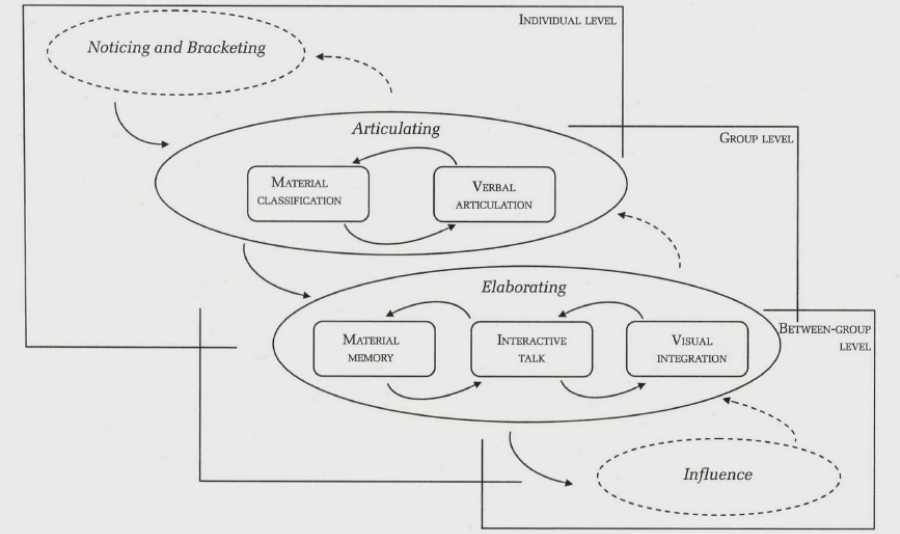
A central theme in sensemaking (Weick Sutcliffe & Obstfeld-2005) is that people organize to make sense of equivocal inputs they get from their environment and "enact" this sense back into the world to make that world more orderly. By enacting Weick means the actions of people that aims at transforming their environment which, recursively transforms their own actions (Weick 1979, 1995)
Sense making is commonly understood as a process in which individuals or groups attempt to interpret novel and ambiguous situations (Weick, 1995). The process begins when people confront events or tasks they cannot readily interpret using available mental structures (Kiesler & Sproull, 1982), which is the case when people are asked to change their familiar course of action, for instance in direct democracy local initiatives (eg changing the way we collectively behave in our district or neighborhood with regards specific issues like transport, common spaces etc.

Collective sensemaking occurs as individuals exchange provisional understandings and try to agree on consensual interpretations and a course of action (Weick, Sutcliffe, & Obstfeld, 2005).
As it's been described by Weick et al (2005), hereafter there are several distinguishing features of sensemaking, including: "*its genesis in disruptive ambiguity, its beginnings in acts of noticing and bracketing, its mixture of retrospect and prospect, its reliance on presumptions to guide action, its embedding in interdependence, and its culmination in articulation that shades into acting thinkingly*" (Weick, et al, 2005: 413).
Early empirical applications of sense making theory focused on discrepancies between a current and an expected state of the world (e,g., Weick, 1988, 1993). Research in this line of inquiry investigated individual and group-level responses to unfamiliar events that occur when people confront circumstances that do not fit available knowledge structures, thus in a retrospective manner (Weick, 1979, 1995).
According to models of sensemaking arising from these studies, individuals respond to cues that disrupt the ordinary, predictable flow of experience and suggest a gap between the reality as it seems to be and how they expected it to be (Barr, 1998), These cues trigger conscious attempts to interpret unexpected occurrences retrospectively and to bring order into ambiguous realities open to multiple interpretations.
Another relevant line of inquiry has explored circumstances under which individuals and groups cope with ambiguous situations that require them to develop novel understandings and engage in forward-looking thinking to "structure the future by imagining some desirable (albeit ill-defined) state" (Gioia & Mehra, 1996: 1229). This different type of sense making has been referred to as "prospective" (Gioia, 1986) or "future-oriented" sense making (Gephart, Topal, & Zhang, 2010).

Despite the fact that prospective sensemaking underpins fundamental organizational processes, such as those mentioned above, this process is under-researched and undertheorized (Stigliani & Ravasi, 2012). Available models provide an insightful but incomplete conceptualization, as little is known of the social interaction and cognitive work that underpin the transition between individual development of new interpretations (Hill & Levenhagen, 1995) and collective engagement in giving a sense of emerging interpretations to relevant stakeholders (Gioia & Ghittipeddi,1991).

In this vein of processual, future oriented stream of research on Sensemaking, Stigliani & Ravasi (2012) have investigated practices of collection, production, manipulation, and use of material artifacts in product design through the lens of prospective and collective sensemaking. These authors found that collective sensemaking emerges out of "*a combination of material and conversational practices*". Specifically, they show how members used an enormous array of physical artifacts making cues and "fragments of interpretations" permanently available, and providing external repositories for team members' emerging connections. Therefore, we understand that not only material practices play a crucial and quite unique role in sensemaking, but they also significantly *"enable the transition from individual to group-level sensemaking"*, has been materialized in the following "Process model of collective future-oriented sensemaking" (Figure 3)

FIGURE 3
A Process Model of Collective Future-Oriented Sensemaking



As outlined in Figure 3, the first cycle of retrospection occurs as group members deliberately immerse themselves in task-related experiences (rather than casually being exposed to them), to produce novel understandings of the environment [**noticing and bracketing**].
A second cycle is associated to the gradual establishment of linkages among emerging understandings [**elaboration**].

Transferability of insights to other settings?

Although some of the material practices embedded in the previous case might seem "too typical" of the professional practice of designers, we believe that several insights about the sensemaking process and the materialization of collective cognitive work can be transferred (Lincoln & Guba, 1985) from the previously described empirical setting to similar contexts in which individuals and groups engage in prospective sensemaking. In essence, design is about making new sense of an object, its potential uses, and contexts of use, and "forging connections" between these elements (Kolko, 2010: 22). Central to design, then, is a process of "meaning making," manifested in the production of new mental models (Kazmierczak, 2003; Krippendorff, 2006). Consistently with this notion, the outcome of the projects observed (Stigliani & Ravasi 2012) was not expressed in terms of formal and technical specifications for a physical object, but as a set of interrelated mental structures proposing a new conceptualization of products and consumers.

Implications for future research: the case of Casablanca Casanearshore technopole "Smart Village" project

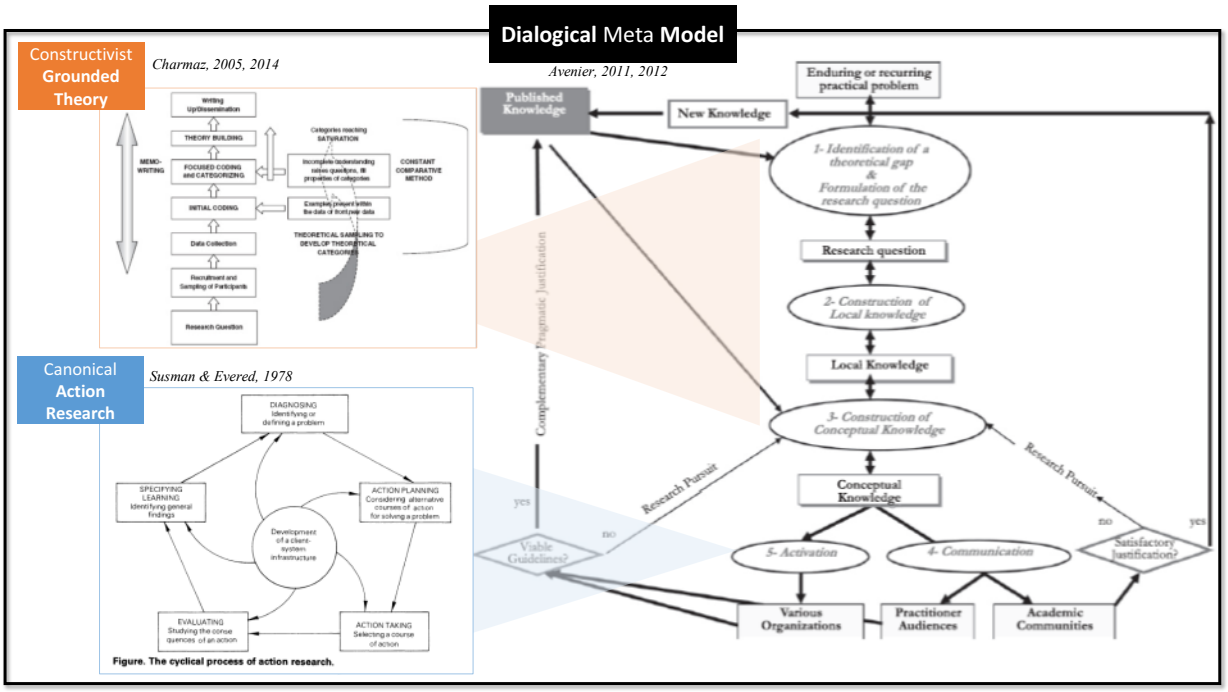
As Stigliani & Ravasi state it (2012), "*We expect comparative replication of our analysis in more traditional (e.g., strategy making) as well as less conventional (...) settings to increase understanding of how different contextual*

conditions may lead to different patterns of interaction and use of artifacts (…) Future research may purposefully select settings characterized by intrinsic divergence of interests among group members to investigate in more depth the interplay between material practices and political processes".

We therefore propose to use distributed sensemaking and future oriented collective sensemaking as foundational frameworks for a processual approach of a dynamic direct governance model, as a keystone of smart city governance as a complex system. Our research shall be grounded on a case of participative re-design of an industrial park, with the purpose of evolving into a "smart (business) village"

From an epistemological standpoint, our research is following the pragmatic constructivist paradigm (Avenier & Gavard-Perret, 2012). The goal here is to intelligibly conceptualize the researcher's understanding of his/her flux of experience about the phenomenon under study. This is basically achieved through iterations of induction and abduction, and the conceptualization work does not pretend to reflect world-as-functions. It aims at offering to actors functionally fit and viable landmarks for thinking and acting in the world.

In line with this paradigm, we propose an innovative methodology integrated the Dialogical model, as a "meta-model" (Avenier, 2012), constructivist grounded theory (Charmaz, 2005, 2014) and canonical action research (Susman and Evered, 1978). Hereafter an integrated view of this framework.



Field of research

The research site is Casanearshore Park, a 20000 employees / 200 companies business park located in the suburb of Casablanca and dedicated to ITO/BPO/CRM offshoring activities, mostly on European markets (especially French & Spanish speaking countries). This park is run by MedZ Sourcing, a subsidiary of the Moroccan state owned company "Caisse de Dépôt et de Gestion" that implements the infrastructure development component of Morocco's integrated growth strategy in the field of emerging & value added industries (including as well, e.g, aerospace, electronics, automotive etc.). Casanearshore is a fully successful venture, given the initial plans but it is confronted today to a fierce global competition of several regional clusters in emerging and developed countries that seek to attract and retain as many corporate actors as possible.

After several trials to develop an ill-defined techno-centered "smart village" concept in a traditional top down approach, Medzsourcing management team got to the conclusion that apart from novel ways to reinvent the park, any initiative won't do more than mimicking existing projects while not necessarily proving the expected value to its current and potential clients, Moroccan and multinational companies.

This challenge, furthermore, took another perspective in the context of the launch of the IEEE smart city transformation project of Casablanca in 2015, as part of a net of 10 global "core cities", since the Smart Village project has been identified as one of the future "living labs" that shall support the smart city transformation roadmap of the city.

In such a context, a proposal has been pre-approved to undertake an action research project aiming at the collective design of a future "Casanearshore smart village" concept by its own actors and its translation into a "design

practice" roadmap (Stigliani & Ravasi 2012) without which purely cognitive and creative processes might seem eventually volatile. In a longer term, the purpose is to craft meta-rules of modelling of the prospective smart village concept that shall eventually be considered for existing and future industrial parks in Morocco and Africa, as part of the innovation strategy of Medzsourcing and the CDG.

Conclusion:

In this paper, we've analyzed the smart cities dynamics through the lens of complex systems architecture, stating that the smartness of a city consists of this continuous learning process that relies on interactions between basic cells and actors of the city.
In this new view of the city being the result of emergent patterns, we've focused on the role of citizens, proposing an original perspective of the dynamics underpinning direct democracy initiatives.
To further explore this perspective, we've proposed to leverage the Sensemaking theory, with the purpose of defining a processual view of distributed / future-oriented sensemaking as a potential framework for practical approaches of direct democracy, through a grounded action research, involving a re-design project of an industrial park through its actors.

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