



## Imagination and Potentiality: The Quest for the Real

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# Escaping the Network

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**Abstract:** We are today agents of a peculiar reality, the global network or the system for automated information production. Our condition in the global network is that of agents of the real, since we all contribute to the coproduction of this ever-evolving process. Nevertheless, I will argue, this reality is but the effect of the adoption of a notion of instrumental pragmatic rationality which denies the existence of any other possible reality as the actualization of different determinations of Reason. While following Deleuze's notion of deterritorialization, I'll show that the real philosophical choice does not concern the introduction of new moves that create differentiations within a universal game, but that it is concerned with the possible abolition of the agency which is instantiated within the collective network.

**Keywords:** agency, evolutionary game, information economy, network, deterritorialization

We are today agents of a peculiar reality, the global network or the system for automated information production. We are players of a game where what we know is what we do and what we do feeds back as information. It is a strategic game where the goal is the evolution of the system through a competition among different hypotheses of action which are meant to satisfy specific utilities. The winning strategies are those which are efficient in predicting the other players' moves in order to bring about an expected favorable state of the network, those strategies are likely to be imitated as constating a functional "know-how".

To give a very simplified example of the reality of the game we are agents of, we can think of chess. A particular distribution of the pieces on the chessboard provides each player with information about the possible moves that are available to the adversary. However, rather than considering the unpredictable adversary's moves as they were dependent on a random variable, the good player considers them as the effect of an unknown strategy (he might learn to predict them). Accordingly, any player tries to guess the hypothesis (the expected state of the chessboard) that supports the adversary's sequence of moves by inducing it from the past interactions; any agent believes that some future actions are more probable than others. In other words, the player A is trying to figure out what kind of pattern player B is expecting to bring about on the chessboard, and this authorizes player A to believe that player B is more likely to respond in some way to these moves: this knowledge, which is updated at any interaction, can be used to find the better way to produce the situation that A expects. In this situation, both the players are updating their beliefs according to Bayes' rule and they are in the process of learning, from the moves of the adversary, the kind of strategy that the other is adopting in order to elaborate a sequence of responses that are meant to bring about some expected future pattern, for example, to achieve a checkmate. The winner is the player whose belief in the realization of an expected situation is "true" and so the strategy can be considered as practically efficient knowledge (know-how): a behavior that is efficient in fulfilling expectations, i.e., in actualizing a certain situation. The reality of the game is the unpredictable sequence of the actual states of the chessboard, a series that nobody can perfectly determine even though any agent takes decisions in order to make some result more probable than another one. So any agent engaged in making the game to evolve toward some situation, one has reasons to believe that is not only possible but more probable than others, thanks to moves and knowledge of the opponent's strategy. If one succeeds, the strategy can be considered

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as based on a true belief, or to be an efficient hypothesis of action. We can then call “knowledge” the confirmed hypothesis of action that a player follows; hence, knowledge is normative with respect to the decisions of action that it entails. Knowledge, as a learned efficient behavior, is what is produced by the repeated interactions: the winning strategy has passed the test and can be used for further games (as a selected behavior in evolution). So here the agents are, at the same time, the supposed “causes” for the transformation of reality (the series of the realized states of the chessboard) and the object of their knowledge, since, in order to predict the becoming of the game, an agent has to figure out the strategy to which the opponent is committed (or the way in which one will act as a cause to transform reality): truth is the value recognized to a belief that has been confirmed by facts and the facts are the real situations that have been produced while looking to prove a belief. This means that truth is the pragmatic value of a hypothesis of action and, thus, it is relative to the real conditions of problem of a specific interaction. This also means that knowledge is the product of a particular interaction and that any acquired knowledge, as a confirmed winning strategy, is challenged while employed to solve new problematic interactions.

The simple example of a two-player game of chess can be extended to model the game which is played in the global network where multiple agents, who are characterized by different beliefs, expectations and strategies, but also by a different amount of information, try to achieve their goals while proving the pragmatic truth of their hypothesis of action. We will see in a moment how such a complex game can be modeled, but before that I would like to put forward some remarks. When reality is conceived as the effect of the interactions among agents (the sequence of the results of moves and countermoves) and agents as the real effects of previous interactions (since the behaviors that define each player are selected according to their tested efficacy), on the one hand we have a becoming reality which is the product of an ever ending collective learning process within which new sequences of moves can be introduced; on the other hand, this infinite unpredictable reality is the mere reality of a game which is supposed to be the only universal process to which any agent is compelled to contribute if one wishes to satisfy the legitimate expectations (to act in order to produce the effects that allow one to possibly satisfy needs, desires, in short, utilities). Our condition in the global network is that of *agents of the real*, since we all contribute to the co-production of the ever evolving process; nevertheless, I will argue, this reality is but the effect of the adoption of a notion of instrumental pragmatic rationality which denies the existence of any other possible reality as the actualization of different determinations of reason. While following Deleuze’s notion of deterritorialization, I will show that the real philosophical choice does not concern the introduction of new moves that differentiate the only universal game, but it is concerned with the possible abolition of the agency which is instantiated within the collective network.

## 1 Evolutionary games and information economy

The global game where anything can be considered as an agent (humans and nonhumans) can be first described from the perspective of evolutionary games. Evolutionary game theory, as a framework to model evolving populations in biology, has been introduced by Maynard Smith<sup>1</sup> in 1982. The main difference with respect to the classic game theory, for example, John Von Neuman’s,<sup>2</sup> is that it does not require that the competing agents are “rational” (that they are consciously taking decisions according to some explicable reason), but it only requires that they have a strategy, meaning that they are characterized by schemas of action, or natural behaviors, that are meant to ensure survival and reproduction (to satisfy a utility). In the simplest evolutionary games, species are different agents with respect to their natural behaviors, so what is competing are, basically, strategies: species who reproduce themselves the most prove to be efficient schemas of action, and the most reproduced schemas of action can be seen as behaviors which are worthy to be imitated (they spread). Winning strategies are selected sequence of

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<sup>1</sup> Smith, *Evolution and the Theory of Games*.

<sup>2</sup> Von Neuman & Morgenstern, *Theory of Games and Economic Behavior*.

moves that allow to satisfy the species' utility by being efficient responses to the possible adversary's moves (the environment). Equilibria are found when any agent could not get a higher reward (in terms of reproduction) by playing a different strategy, so the relative stability of selected schemas of actions can be seen as the result of a spontaneous mutual agreement where any agent gets the best possible payoff.<sup>3</sup>

The central concept of game theory is "utility", it was introduced by Samuelson<sup>4</sup> to indicate whatever an agent's actions are meant to make more probable. Accordingly, any player can be seen as behaving in order to maximize the utility or to make a future beneficial situation more probable than another one by selecting moves that are efficient responses to possible changes in the environment (other players being part of the environment). Samuelson's definition of utility was conceived to be general enough to apply to any kind of agent, a human, an animal, a plant or a machine, to indicate their different expected payoff. For example, while an animal performs the moves which have been naturally selected to satisfy the utility of survival and reproduction, humans are able to introduce new "nonnatural" utilities, which, of course, entail that they are supposed to have a nonnatural strategy to satisfy them. Hence, humans are not genetically bounded to enact one and the same behavior, but they can introduce new hypothesis and give themselves the tools to prove the efficacy of the former with respect to the satisfaction of nonnaturally determined utilities (consumption of goods, economic profit, social recognition, etc.). Proven efficient strategies then become conventions or behavioral norms that, on the one hand, tell what an agent should do in order to get a certain payoff and, on the other hand, constitute a sort of "common knowledge" that authorizes an agent to expect some specific moves from the others. David Lewis<sup>5</sup> made a famous example in order to explain the rise of social conventions (as a sort of common normative knowledge) within the framework of coordination games (inspired by the economist Thomas Schelling<sup>6</sup>). The norm of driving on the right-hand side of the street is not genetically determined; however, it becomes natural as a strategy that, when adopted by everybody, allows to satisfy the utility of avoiding accidents in such a way that no agent can be interested in deviating from the behavior. A Nash equilibrium is then obtained and, under the hypothesis that the strategy of driving on the right-hand side of the street is efficient to satisfy a common utility, agents are justified to expect that the others will conform. Though, like in the case of animal's naturally selected strategies, the success of the behavior is measured by its replication. We could say that social conventions, or norms, are common knowledge as practical strategies for achieving an equilibrium. Such strategies have been learned within the process of a game where different agents come to agree that the prediction of a certain hypothesis is true: the truth of the hypothesis of driving on the right-hand side of the street is confirmed by the realized behaviors, or the degree of belief that it deserves is measured by the effects that it produces in terms of commitment.

However, although there are some stable norms which are commonly adopted, human interactions cannot be reduced to the achievement of mutually beneficial forms of agreement and this is because there is not something like a universal utility that anybody would tend to satisfy. This entails that different agents take decisions in order to achieve different goals or to satisfy heterogeneous expectations. Accordingly, their moves depend upon various hypotheses of action. Now, if, like in Lewis' example, anybody knew the others players' utility (to avoid car accidents, for example), then it would be possible to predict the probability of anybody else's moves (since they are supposed to bring about a specific situation); on the contrary, when an agent does not know which expectations the others are trying to fulfill, then the achievement of an equilibrium becomes more complex problem. More sophisticated evolutionary games try to model interactions among heterogeneous agents who are engaged in learning the other's strategies through repeated interactions. In these dynamic games of incomplete information, agents are modeled as Bayesian learners<sup>7</sup> who have to figure out what kind of utility the opponents are

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<sup>3</sup> According to the definition of Nash equilibrium: a stable state of a system involving the interaction of different participants, in which no participant can gain by a unilateral change of strategy if the strategies of the others remain unchanged.

<sup>4</sup> Samuelson, "A Note on the Pure Theory of Consumer's Behaviour," 61–71.

<sup>5</sup> Lewis, *Convention*.

<sup>6</sup> Schelling, *The Strategy of Conflict*.

<sup>7</sup> This approach has been introduced by Paul Milgrom and John Robert in 1991. See: Milgrom & Robert, "Adaptive and Sophisticated Learning in Normal Form Games," 82–100.

trying to satisfy by inferring it from previous interactions. As it has been shown by algorithmic simulations,<sup>8</sup> in this kind of games, Nash equilibria can be approximated in the long run (after a sufficient large number of repeated interactions), nevertheless, it has also been pointed out that such equilibria arise under restrictive conditions that are hardly met in “reality”.<sup>9</sup> The reality which is modeled here is that of the market where not only agents start with partial information and heterogeneous beliefs (hypothesis of action) but where they can also modify their utility, decide to imitate other players’ strategy, display actions that are meant to study the other reactions or hide information. Further simulations of evolutionary game among economic strategic agents, who do not enjoy a perfect knowledge concerning their reciprocal expectations, have shown unstable and complicated dynamics.<sup>10</sup> Rather than leading to stable equilibria, the interactions produce an ever evolving and unpredictable dynamic, thus a situation of general uncertainty (the risk of a move cannot be precisely calculated since the set of the possible decisions of the opponent is not “known”). On the one hand, the instability of the equilibria and the complex dynamics that emerge from the interaction among heterogeneous agents is the guarantee of a rapid evolution of the strategies and, thus, of the becoming of the whole game; on the other hand, the uncertainty about the players’ beliefs, hypotheses and strategies (anybody is constantly updating beliefs and modifying preferences and moves) exposes the agents to a more “risky” situation where events such as an increase in volatility or economic bubbles become more likely to happen. To this regard, it is important to recall that, according to classic economic theory, a fair market – a situation of equilibrium where any rational agent has as much chances as anybody else to satisfy the utility – is characterized by perfect information, so that any player can calculate the risk of their decisions (the probability that a sequence of move will produce a certain payoff) with respect to the knowledge of the other players’ possible moves. Conversely, a situation of incomplete information leads to an imperfect market where risks cannot be assessed and where the dynamic cannot be said to tend to stable equilibria.<sup>11</sup> The role of information then become crucial since players who are able to gather more information have, basically, more chances than the others to satisfy their utility. Such a market, where profit depends upon a fundamental asymmetry of information, has been called “information economy”. As Joseph Stiglitz<sup>12</sup> pointed out, “the fundamental breakthrough in the economics of information was the recognition that information was fundamentally different from other commodities”.<sup>13</sup> In such a situation, “the market and market participants might actually create noise forcing other market participants to spend valuable resources at least partially to undo this artificially created noise”.<sup>14</sup> Moreover, Stiglitz recognizes the importance of evolutionary economics, and the game theoretic models that are employed to model the market dynamic and to explain the instability and the uncertainty that characterize the present global economy. This instability is the condition for the unpredictable dynamic of the market where new hypotheses are introduced as well as new expectations and utilities (innovation). The effects are, at the same time, an increase in the opportunity for speculation and an increase in systemic risk. In the present global network, where agents enjoy the information that they can afford and where information producers constantly release new costly information, strategies are rapidly evolving and knowledge (efficient strategies) becomes rapidly obsolete.<sup>15</sup> In this situation, agents, who embody

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<sup>8</sup> Kalai & Lehrer, “Rational Learning Leads to Nash Equilibrium,” 1019–45.

<sup>9</sup> Foster & Young, “On the Impossibility of Predicting the Behavior of Rational Agents,” 12848–53.

<sup>10</sup> Brock, Hommes, & Wagener, “Evolutionary dynamics in markets with many trader types,” 7–42.

<sup>11</sup> Brock, Dindo, & Hommes, “Adaptive rational equilibrium with forward looking agents,” 241–78.

<sup>12</sup> He is a recipient of the Nobel Memorial Prize in Economic Sciences in 2001.

<sup>13</sup> Stiglitz, “The Contributions of the Economics of Information to Twentieth Century Economics,” 1448.

<sup>14</sup> Ibid., 1455.

<sup>15</sup> This is particularly evident if we consider high frequency trading strategies which are profitable only when they do not constitute common knowledge. As Aldridge explains: “It is worth keeping in mind, however, that strategies made public soon become obsolete, as many people rush in to trade upon them, erasing the margin potential in the process. As a consequence, the best-performing strategies are the ones that are kept in the strictest of confidence and seldom find their way into the press, this book being no exception”. Aldridge, *High-Frequency Trading. A Practical Guide to Algorithmic Strategies and Trading Systems*, 6.

different kinds of strategies or schemas of actions, compete in order to maximize their utility while learning, from the repeated observations, which beliefs support the others moves, which new efficient moves are available and which kind of information motivates these unusual hypotheses. Accordingly, agents can decide to imitate other's strategies, to endorse their beliefs and to modify their expectations with respect to the newly acquired – but always partial – information. However, any agent's move or decision produces data (information) which are gathered by information producers and sold to someone who can afford it. This information, that concerns the popularity of beliefs and strategies (the most shared behaviors), is used to make more accurate hypotheses of action that take advantage of the predictability of what has been established as common knowledge (shared and no more valuable information). New hypotheses are then introduced that has the effect of modifying established beliefs and strategies.

In this evolutionary game, anybody is an agent, since anybody expresses a behavior that depends upon the expectation of satisfying the utility and anybody contributes to the unpredictable becoming of the global system, nevertheless, the competition is far to be perfect. The players who can afford the more and more sophisticated technology that is needed to extract new information from the data can not only display more efficient strategies but also manipulate the other players' beliefs and actions (we understand the crucial role of the "experts"). Hence, truth – conceived as the measure of a hypothesis popularity – is in the hands of information dealers and forecast producers who possess a better knowledge of what the other do and, as a consequence, the authority to tell them what they *should* do. So even though are all agents of the real, or players in the global economy game, we have to recognize that some have more agency than others: this depends upon their position in the network where the importance of knots depends upon their connections or their capacity of gathering and releasing information.

## 2 Prisoners of evolution

What is the real we are supposed to be agent of? The real is the universal game of evolution that started when living beings appeared on Earth, or even before, with the first self-organizing nonliving systems. As Stuart Kauffman<sup>16</sup> claims, the complexity of biological systems and organisms might result from self-organization as well as from natural selection. He used random Boolean networks to investigate generic self-organizing properties of gene regulatory networks to show that there is a spontaneous tendency toward the establishment of collective coordinated behaviors. While an "autonomous agent is something that can both reproduce itself and do at least one thermodynamic work cycle",<sup>17</sup> agency is what evolves by giving rise to more and more complex networks.<sup>18</sup> As Stuart Kauffman explains, "a nonequilibrium autonomous agent literally constructs itself as it coevolves with other agents. The structure of the organization is also the record of the embodied 'know how' to achieve catalytic and task closure, a record updated by mutation and selection".<sup>19</sup> Reality, then, is the process constituting, "the collective behavior of communities of coevolving agents and the abiotic environment".<sup>20</sup> Moreover, the networks which exhibit the most efficient behaviors, and that for these reasons are selected within evolution, are those whose dynamic is not bounded to a unique attractor but can reorganize themselves by achieving different possible equilibria (whose number cannot be *a priori* determined). According to Kauffman, networks that are able to display new forms of collective behavior or to introduce novelties (far from equilibrium dynamics)

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<sup>16</sup> Kauffman, *The Origins of Order: Self Organization and Selection in Evolution*.

<sup>17</sup> Kauffman, "Autonomous Agents, Self-Constructing Biospheres, and Science," 17.

<sup>18</sup> Kauffman does not specify the distinction between "system" and "network". It seems to me that he can be considered to think at the frontier between the two kinds of organizations: individual systems are networks, however, different networks interact as coevolving systems, one being the environment of the other. This perspective is overcome in what he calls the "econosphere", the most complex network which constitutes a further step in evolution, i.e., a more complex far from equilibrium dynamic.

<sup>19</sup> Ibid.

<sup>20</sup> Ibid.

are more likely to be selected since they can adapt to major changes by “inventing” new strategies. This allows them to replicate their “successful” behavior and *to make history* by enabling new adjacent possible.<sup>21</sup> Evolution is the reality of a process that privileges creativity and innovation, thus the strategies that are more productive in terms of introducing new moves are more likely to spread, to become normative (they are the model for what agencies ought to do in order to adapt or to successfully satisfy their utility). Reality is the unpredictable unfolding produced by the strategies which are performed, while these same strategies express a more and more efficient knowledge of reality. This knowledge is true since it is actually efficient in achieving the goal of reproduction: agency, then, can be said to compete in order to affirming themselves as normative “know-how”. This evolutionary game unfolds as a process of knowledge production (coevolving knows how) which tends toward an increasing complexity. This historical process that culminates in our human societies which are networks exhibiting far for equilibrium dynamics that are highly “creative”, in terms of knowledge production, global reproduction and innovation. To put it otherwise, the global evolutionary game is a becoming reality which reproduce itself by producing new information;<sup>22</sup> this is evident in our economic system where new information is the most valuable good. As Stuart Kauffman explains, “Like the biosphere, the ‘econosphere’ is a self-consistently co-constructing whole, persistently evolving, with small and large extinctions of old ways of making a living, and the persistent small and large avalanches of the emergence of new ways of making a living.”<sup>23</sup> In the natural biosphere as well as in the global market, players do not act according to unchangeable schemas of action and utilities, “strategic economic agents will instead create an unstable set of coevolving expectations about one another, and the actions they take based on those expectations will constantly change.”<sup>24</sup> On the one hand, this means that the evolution of the global economy strategic game implies the evolution of the schemas of action which are, basically, ways of living or identities<sup>25</sup> (a set of preferred utilities and consequential behaviors); on the other hand, this entails that the heterogeneity of the agents is functional to innovation or to the productivity of the system (no competing strategies, no evolution). In the market, while equilibrium means stillness and equal chances (perfect information: one knows what anybody can do), a situation far from equilibrium, as it is described by Kauffman, means becoming and disparity of chances since some players are allowed to do what the others cannot expect (imperfect information) by introducing novelties. As we saw in the recent economic crisis, innovations – like, for example, the creative financial moves performed within the American housing market – brought about an unpredictable situation exceeding any probabilistic forecast on volatility, a literary far from equilibrium dynamic that produced an effective change in global economy. However, we could say the same for the new strategies of high-frequency trading as they are based on the reproduction of a disparity of information and on instantaneous market inefficiencies. So it seems to me, the question is should we justify the unfairness of the financial game, which is based on the reproduction of a disparity of chances, as the necessary effect of the game of evolution? Should we justify the contemporary uncertainty and instability of the market (the chaotic dynamic of volatility, for example) as the positive effect of complexification and universal creativity? Or should we just admit that the game’s theoretic evolutionary model is the story which is told to make us accept the uncertainty and the increasing risks to which our lives are exposed for the sake of a “creativity” that is advantageous only for the happy few information monopolists?

As we saw above, new and creative moves can be performed only by those agents who can afford information about other players’ schemas of action and who can develop the technology to explore

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<sup>21</sup> “The biosphere and perhaps also the global economy, enter the adjacent possible in such a way that the diversity of organized processes in the biosphere, or ways of making a living in both the biosphere and economy, is maximized”. Kauffman, *Reinventing the Sacred*, 128.

<sup>22</sup> This expression is usually attributed to Gregory Bateson.

<sup>23</sup> Kauffman, *Reinventing the Sacred*, 150.

<sup>24</sup> Ibid., 157.

<sup>25</sup> In *Identity Economics: How our Identities Shape our Work, Wages and Wellbeing*, George Akerlof (Nobel Memorial Prize in 2009) and Rachel Kranton argue that individuals do not have preferences only over different goods and services. They also adhere to social norms for how different people should behave. The norms are linked to a person’s social identities.

the data. These players not only have better knowledge of the real but also have the power of producing the unexpected (by the most) future reality by introducing strategies that anybody has to recognize as true, i.e., moves that ought to be imitated since they are more efficient to realize a profit. To put it otherwise, disparity of information authorizes to bet on a number of the roulette that nobody believed it existed and this decision enables the possibility of a new behavior by modifying general expectations. Here, clearly, the problem is that, by describing evolution as a game of competing strategies or agencies, the present economic system, or global complex network, is justified as the necessary development of the only universal “natural” process whose stake is its self-reproduction through innovation. In short, the game of evolution is the self-justification of information market’s actual reality. The celebrated innovative attitude what we *ought to do* in order to express the market agent’s kind of freedom: the same freedom that characterizes automated Bayesian learners or artificially intelligent information networks. The market agent’s freedom is decision-making under uncertainty and risk management. These strategic behaviors rely on the ability to bet on the realization of a future event, given the probability of the moves that will be performed by the other (less informed) players. This probability is determined by exploring the data feeding back from the realized behaviors within a process of continuous hypothesis updating and through the introduction of new hypothetical predictive correlations (moreover, new hypothesis suggests the introduction of new behaviors). That many lose and few win is not a problem, this is evolution, anything contributes to the production of knowledge and to the becoming of the whole: the network always wins, or should I say the Casino?

### 3 The universal becoming network includes all the differences and it is different from nothing

Our network society is presented as the last step in the free and creative universal history of evolution. With respect to the previously adopted system theoretical model, the global network represents an increase in the interactive capacity that has been extended beyond the boundaries of system’s operational closure. Rather than a patchwork of locally coevolving agencies – that would give rise to hierarchy of wholes encompassed by a dubious systems of the systems<sup>26</sup> – the network is a horizontal and decentralized structure (a rhizome) whose becoming does not depend upon the interaction with a supposed exteriority (like any system necessary environment) but on the continuous reticulation of the internal connections that determine information flows. The network is a reorganizable organization where agencies are engaged in different and temporary common projects whose goal is the satisfaction of specific and variable utilities. A network organization is characterized by the ever-evolving structure of the connected knots. Information flows from one knot to the connected ones, thus any agency can gather the data coming from the connected agencies and, of course, inform them. However, connected knots can be displaced anywhere and information flows are not limited to spatially located neighborhoods. Agents temporarily sharing a common utility have all the interest to be strongly connected in order to improve the capacity of gathering, processing and releasing information, and they form a cluster and coordinate their strategies. Networks constituted by strongly connected agencies (clusters) can be said to compete against each other to achieve their goal, where the goal is the truth of their hypothesis of action which is measured by the number of agents who are committed to it (who believe the information by endorsing the strategy). Accordingly, a “winning” network (cluster) has more connection than another one since, on the one hand, this means that it is able to gather more information and, on the other hand, that the released information (a hypothesis of action) informs (or connects) a higher number of agencies. For example, a bunch of people decide to cooperate for creating

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<sup>26</sup> Given that any system knows how the systems with which it interacts, no knowledge of the emergent system of the systems is possible since it would require that it could interact with an exterior system, hence it would be the system of the systems. Since, according to the system theory we are parts of the whole, we cannot observe the all-encompassing whole.

a network enterprise to produce and sell an app; they share their information (coming from the different networks they are connected with) to write a code that is supposed to be efficient to satisfy the utility of sharing and treat a specific kind of information. The app is, basically, a new hypothesis of action, which is meant to satisfy the expectation of a more efficient information treatment. The success depends upon the number of agencies who will believe that the use of the proposed strategy is more efficient to satisfy their utility (treat information) than another one. Accordingly, the success is measured by the number of agents that will actually adopt the suggested schema of action by using the app. Moreover, the popularity of the product will create a network of users connected with the app creators providing them, with the possibility of gathering more information that can be used to implement the service and making the initial network enterprise to grow, i.e., to be more extensively connected or to become more influential in terms of shared practices. So the winning effect is a change in the structure of the network or of the dynamic of information flows. From this example, it is evident that network agents are not parts interacting within an emergent whole; conversely, connected knots cannot be distinguished from the network structure: the network realizes immanence or embeddedness. The network does not emerge like a whole which is qualitatively different from the parts that compose it, while enjoying a higher hierarchical role. On the opposite, a network changes while some knots gain a more central position (more connection) and other are relegated to the periphery (fewer connections). Central (more connected) knots, or central clusters, have, at the same time, the opportunity of collecting more data and the power of spreading hypothesis of action more efficiently, i.e., to make the schemas of action that they suggest true, where "truth" is the value of a replicated strategy which is adopted as a norm (telling what one ought to do). The popularity of such a "norm" does not determine the strict interaction of parts within a whole which differentiates itself from the environment (the system necessary operational closure), but it brings about a reorganization of information flows within the totality global network, a change in the connections and the constitution of new clusters. Contrary to a system, which functions, thanks to the limit that distinguishes its operations from the operations of the environment, the global network does not have any exteriority but an ever changing structure within which fuzzy cluster forms, dissolves, connects and disconnects. Hence, anything is in the network, but some agent (or cluster) is more connected than another one or enjoys a more central position. The "power" of an agent (or a cluster) depends upon this ever changing topology. It is, basically, the capacity to spread hypothesis of action which is more "believable" since they are supported by a relational position that allows to access a clearer (but always partial) knowledge of the state of the network. In the network evolutionary game, strategies are meant to provide an agent (or a cluster) with a privileged position while, to get such a position, the agent (or the cluster) needs the computational devices to access and treat impressive quantities of data. As a consequence, one needs to be able to afford the technology to collect and explore the data, since the amount of information cannot be efficiently treated by one single human mind. Computational devices are then essential to the functioning of the present global network. As Manuel Castells explains:

On the one hand, they are the most adaptable and flexible organizational forms, so following very efficiently the evolutionary path of human social arrangements. On the other hand, in the past they could not master and coordinate the resources needed to accomplish a given task or fulfill a project beyond a certain size and complexity of the organization required to perform the task. Thus, in the historical record, networks were the domain of the private life, while the world of production, power, and war was occupied by large, vertical organizations, such as states, churches, armies, and corporations that could marshal vast pools of resources around the purpose defined by a central authority. Digital networking technologies enable networks to overcome their historical limits. They can, at the same time, be flexible and adaptive thanks to their capacity to decentralize performance along a network of autonomous components, while still being able to coordinate all this decentralized activity on a shared purpose of decision making.<sup>27</sup>

The network society is a further step of the evolutionary game, which consists of the universal process of knowledge production. It could not have been achieved without the information technology which is

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<sup>27</sup> Castells, *The Network Society: From Knowledge to Policy*, 4.

available today. Conversely, this same technology would not have been possible without the natural tendency toward complexification and innovation that is expressed by the universal game of evolution. In the global network, players are not simply engaged in local coevolutionary processes but in a planetary competition where the stake is the transformation of the structure of the universal network in a way which is suitable for capitalizing in information and knowledge. In order to access the central position, agents (or clusters like companies) have to connect to agents in any region of the planet in order to replicate the normative schemas of action which are considered to be more efficient (for example, by connecting to a specific network or cluster, agents believe that one will be able to access more relevant information). As a consequence, the entire world is pushed into the race to connectivity which implies the adoption of the related technology. As Castells puts it:

Global development is now largely a function of enabling countries and their people to function productively in the global economy and the network society. This implies the diffusion of information and communication technologies throughout the world, so that networks reach everywhere. But it also implies the production of the human resources necessary to operate this system, and the distribution of capacity to generate knowledge and manage information. The new, informational model of development redefines the condition of shared growth in the world.<sup>28</sup>

On the one hand, the global network allows any kind of agent or identity (an agent characterized by a particular kind of utility and by a strategy that is meant to satisfy it) to join the competition; on the other hand, the acceptance of heterogeneous players rests on a preliminary condition: the acceptance of the rules of the global game technological information production. Thus, as Castells puts it, “the culture of the global network society is a culture of protocols of communication enabling communication between different cultures on the basis, not necessarily of shared values, but of sharing the value of communication. This is to say: the new culture is not made of content but of process.”<sup>29</sup> The heterogeneity of identities, as projects or strategies, is included in the network since it constitutes information about the enacted schemas of action; moreover, identities are constantly transformed and updated (differentiated) together with the functional introduction of new utilities and expectations. Nevertheless, I would argue, difference here is a mere illusion since it is submitted to the sameness of the universal game which welcomes, as functional to its own becoming, a plurality of competing strategies, or identity projects, that contribute to the becoming of the same, rather than contesting its universality. As George Akerlof noted, “in a world of social difference, one of the most important economic decisions that an individual make may be the type of person to be”.<sup>30</sup> And I would like to note that, if identity is the strategic decision of being a certain kind of player, then identities depend upon the previous acceptance of the universal protocol of the evolutionary global game (what enables one to be a player). The network, then, is not the place where heterogeneous agencies (way of living or identities) interact, but the very condition for the construction of that plurality of strategic schemas of action that are called “identities” conceived as economic decisions that implies specific preferences and utilities.

The sufficient and necessary condition to be an agent of the evolving reality of the network is to calculate, consciously or unconsciously, and the mathematical rules are those which have been made explicit by the automated systems of knowledge production. Evolution has turned agents into Bayesian learners. However, this kind of calculation is not natural, animals, for example, do not calculate, at least in the same way that is required for successfully surviving in our present global environment, and, as a matter of fact, animals are getting extinct. The problem is, then, to understand how it happened that we evolved into such calculative agencies if this step is supposed to be supported by some principle of natural evolution. Michel Callon suggests that “in order to become calculative, agencies do indeed need to be equipped”<sup>31</sup> and this equipment is the technology that we developed, thanks to a creative drift toward complexification. From this

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<sup>28</sup> Ibid., 18.

<sup>29</sup> Castells, *Network Society. A Cross Cultural Perspective*, 39.

<sup>30</sup> Akerlof & Kranton, “Economics and Identity,” 748.

<sup>31</sup> Callon, *The Laws of the Market*, 6.

standpoint, the network is “not a network connecting entities which are already there, but a network which configures ontologies. The agents, their dimensions and what they are and do, all depend on the morphology of the relations in which they are involved.”<sup>32</sup> The network is then the result of the interaction with algorithmic agencies, and it realizes the collective calculative machine that is constantly evolving by producing always new information that feeds back to produce further innovation. As Callons argues:

Calculativeness couldn’t exist without calculating tools. Consequently and in order to understand how they work, full significance has to be restored to that humble, disclaimed and misunderstood practice: accounting and the tools it elaborates. The most interesting element is to be found in the relationship between what is to be measured and the tools used to measure it. The latter do not merely record a reality independent of themselves; they contribute powerfully to shaping, simply by measuring it, the reality that they measure.<sup>33</sup>

It is because of the strategic nature of the evolutionary economic game that calculation had to evolve toward further complexity in order to guarantee growth or enablement of new opportunities. Far from equilibrium and nonlinear dynamics that characterize this stage of the game require the support of computational technology, and the use of such calculative devices amplifies the complexity of information flow dynamics. As a consequence, the player’s success depends upon their ability to connect with advanced computational devices, and the differences in the capacity of affording such connections constitute asymmetries in the chances of satisfying utilities.

The more an agency is able to complicate and broaden the network of entities and relations to be taken into account, the greater is its capacity to create asymmetries between itself and other agencies. Competition between calculative agencies, focused on their ability to have their decisions recognized and accepted (for example to propose a given product on a given market segment), is largely determined by the respective qualities of the calculating devices. The probability of gain is on the side of the agency with the greatest powers of calculation, that is to say, whose tools enable it to perform, to make visible and to take into account the greatest number of relations and entities.<sup>34</sup>

All the differences are included in the network and the network produces all the differences with a global competition which is different from nothing. There is nothing outside the network; no agency is excluded since the network is the condition for the being of any agency, however, there are more or less connected agencies, more or less efficient strategies. Anything contributes to the evolutionary game, and this is especially true now that the borders of local systems have been opened to global connectivity. The network knows no alterity, no opposition, no difference since it includes them all and articulate them all within a unique competition. On the one hand, we are all agents of this real since what we do actually contribute to the transformation of the structure of the network (evolution); on the other hand, it is the reality of the game that constitutes us as players whose decisions and schemas of actions are submitted to the performativity of the computational devices. We constitute and we are constituted by hybrid *agencements*, as Deleuze and Guattari, quoted by Callons, noted:

The notion of agencement is also a philosophical concept whose proponents, Gilles Deleuze and Félix Guattari, can be considered as part of a French pragmatist tradition. In his discussion of Foucault’s notion of “device” (dispositif in French), Deleuze develops an account that is closer to the idea of agencement. For Deleuze, the subject is not external to the device. In other words, subjectivity is enacted in a device – an aspect, we think, that is better rendered through the notion of agencement. In Deleuze’s phrasing, a device “is a tangle, a multi-linear ensemble. It is composed of different sorts of lines. And these lines do not frame systems that would be homogeneous as such (e.g., the object, the subject, the language). Instead, they follow directions, they trace processes that are always at disequilibrium, sometimes coming close to each other and sometimes getting distant from each other. Each line is broken, is subjected to variations in direction, bifurcating and splitting, subjected to derivations” (Deleuze, 1989: p. 185, our translation, emphasis in original).<sup>35</sup>

<sup>32</sup> Ibid., 8.

<sup>33</sup> Ibid., 23.

<sup>34</sup> Ibid., 45.

<sup>35</sup> Callon, Muniesa, & Millo, “An introduction to market devices,” 2.

The network, within which agency is produced as a functional to the axiomatic of growth, is the machinic *agencement* (assemblage) that has been described in *L'Anti-Oedipe* and *A Thousand Plateaus*, a noncentralized structure or a rhizome:

finite network of automata in which communication runs from any neighbor to any other, the stems or channels do not preexist, and all individuals are interchangeable, defined only by their state at a given moment – such that the local operations are coordinated and the final, global result synchronized without a central agency.<sup>36</sup>

However, rather than celebrating the new social organization that has been brought about by the evolution of capitalism, Deleuze and Guattari denounce the hybrid network as the expression of a new form of slavery:

recurrent and reversible “humans–machines systems” replace the old nonrecurrent and nonreversible relations of subjection between the two elements; the relation between human and machine is based on internal, mutual communication, and no longer on usage or action. In the organic composition of capital, variable capital defines a regime of subjection of the worker (human surplus value), the principal framework of which is the business or factory. But with automation comes a progressive increase in the proportion of constant capital; we then see a new kind of enslavement: at the same time the work regime changes, surplus value becomes machinic, and the framework expands to all of society. [...] In machinic enslavement, there is nothing but transformations and exchanges of information, some of which are mechanical, others human.<sup>37</sup>

In short, in the network all the differences are included and agents are actually constituting a hybrid machinic assemblage that evolves in an unpredictable way by modifying constantly its structure and introducing novelties. Nevertheless, in order to be an agent of this real, or a connected machine through which the creativity of the universal evolutionary game realizes itself, there is a price to be payed: to submit to an axiomatic that reduces the activity of thinking to an efficient practice whose aim is the satisfaction of a social/economic utility. On the one hand, the process is supposed to produce knowledge (since social influence depends upon the capacity of accessing, updating and releasing information), whereas, on the other hand, all these knowledge are produced by automated calculation: a very reductive notion of what thinking is. Within the (unfair) reality of the game of information economy, agency is formatted by a basic notion of instrumental and calculative rationality. This means, to borrow *A Thousand Plateaus* vocabulary, that, within the global network, innovations are relative rather than absolute deterritorializations, only the latter expressing the real revolutionary power of thought. As Deleuze and Guattari warned, the relative deterritorializations, through which the global economic network ensures its productive becoming or evolution, should not be confused with the absolute deterritorialization that aims to the negation of the established productive process.

The strata are continually being shaken by phenomena of cracking and rupture, at the level of the substrata that furnish the materials (a prebiotic soup, a prechemical soup.), at the level of the accumulating epistrata or at the level of the abutting parastrata: everywhere there arise simultaneous accelerations and blockages, comparative speeds, differences in deterritorialization creating relative fields of reterritorialization. These relative movements should most assuredly not be confused with the possibility of absolute deterritorialization, an absolute line of flight, absolute drift. The former are stratic or interstratic, whereas the latter concern the plane of consistency and its destratification.<sup>38</sup>

In order to liberate thought from its reductive instrumental submission to reality of the global evolutionary game, the philosophical proposal, then, is the abolition of the form of the connected agency. This can be done through absolute deterritorialization, by accessing the limit of the system or the plane of immanence: the only available “exterior” position (the internal limit of productivity or its zero degree) from which the condition of a new reality might be thought. According to Deleuze and Guattari, “D(territorialization) is absolute when it [...] brings about the creation of a new earth, in other words,

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<sup>36</sup> Deleuze & Guattari, *A Thousand Plateaus. Capitalism and Schizophrenia* 2, 17.

<sup>37</sup> Ibid., 458.

<sup>38</sup> Ibid., 55.

when it connects lines of flight, raises them to the power of an abstract vital line, or draws a plane of consistency.”<sup>39</sup> As it consists of reaching the limit, or the genetic virtual or abstract conditions for any form of subjectification, absolute deterritorialization consists of renouncing individual agency to assume the condition of the schizoid (what precede any form of differentiated identity). Moreover, this speculative move leads to acknowledge the contingency of the supposed universal process not in terms of its unpredictable becoming but in terms of its possible abolition. To put it otherwise, to think, in speculative, noncalculative and noninstrumental terms, means to acknowledge that creativity do not unfold by spinning the wheel in the Casino but that the evolutionary Casino is merely one among the possible reality that can be brought into existence. The condition for such a move is to dare to think without looking for the support of the history of evolution and is to dare to think without reducing reflection to a strategic instrumental behavior.

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<sup>39</sup> Ibid., 509.