An STS approach to the design of Online Reputation:
The Assemblage Theory compared with Methodological Individualism

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1. Introduction

This paper is part of a project for the development of a participative and bottom-up journalistic social web platform (the *Timu Platform, http://timu.ahref.eu/*), developed by the Ahref Foundation (http://www.ahref.eu/en), and whose aim will be to harness the power of peer-production and crowd-sourcing in the production of a citizen-driven journalism (Gillmor, 2004). The Platform will support the mission of the Ahref Foundation: to hypothesising, designing, implementing, testing and establishing logical incentives that encourage the improvement of the Quality of Information. For the Ahref Research and Development team assessing the *Reputation* of people using Timu is a critical aspect for supporting the collaboration and fostering the creation of Quality Information. To this end, a number of Reputation requirements have been identified with the goal to design a Reputation Framework for the Platform. **Reputation in Timu**: (1) will be the "Curriculum Vitae" of participants; (2) will be how a participant is seen by others; (3) should support the formation of groups inside the platform; (4) should reward and support the continuous participation of users; (5) should support the collaboration among participants; (6) should allow users to make distinctions between good and bad information; (7) should allow users to make distinctions between good and bad "guys". I took this opportunity for the design of an Online Reputation Framework with these requirements (1-7), to foster my agenda for a novel Science and Technology Studies (STS) approach to Reputation.

2. Few words on online interactions and methodological individualism

According to the Oxford Concise Dictionary Reputation is «*the beliefs or opinions that are generally held about someone or something*»[1]. Dellarocas (2003) described Online Reputation as the «*Digitization of the Word of Mouth*» in this way arguing for similarities in the process of formation of Offline and Online Reputation. According to Lash (2002) in the information age Social Interactions are dis-embedded from the "pure social context" and Sociality among people is achieved thorough machine interfaces. Online Reputation as the "*Digitization of the Word of Mouth*" relies on web recommender and reputation systems, that collect and aggregate ratings, votes, comments on several aspects of the online behaviour of users or other entities. These ratings are then represented in a variety of ways at the interface level to support the stability of Online interactions. For instance a common patterns

for representing online reputation in e-commerce web sites is the 5 stars rating system, that support e-commerce interactions between sellers and buyers.

The most influential theories used to understand the "*Digitization of the Word of Mouth*" owe much to Methodological Individualism. This approach «*amounts to the claim that social phenomena must be explained by showing how they result from individual actions, which in turn must be explained through reference to the intentional states that motivate the individual actors.*» (Heath, 2010). There are two key aspects to consider in Methodological Individualism:

1. social phenomena are the result of an aggregation of individual actions
2. actors are rational agents, acting according to motivations (economic returns, values etc.)

The following Table 1 summarizes three of the most influential Methodological Individualism approaches to Online Reputation: those of Dellarocas, Taddeo and Gambetta. The table also contains my comments highlighting the Methodological Individualism grassroots of the approaches.

Online Reputation and Methodological Individualism Examples
1. Dellarocas (2010, p.33): «the first step toward smart management of the social web is to understand something paradoxical about it: The new platforms may be all about harnessing crowds and communities, but in the end, those crowds and *communities are nothing but a sum of individuals*. And your company's social web efforts will succeed only to the extent that you are able to attract good individuals, motivate them to perform good work, and empower them to get to know and trust one another enough to collaborate toward the end goals of the community. The question is, how do you do that? The answer: by *capitalizing on the motivational power of reputation*.» [emphasis in italic added]
Comment: Dellarocas is a key theorist of online reputation, with a focus on business and management. Clearly for Dellarocas online communities are outcome of an aggregation of individuals. Further, for him harnessing reputation for the success of the social web rests on the premise that gaining reputation is a key motivation for participants.
2. Gambetta (1988) alike models: «Game-theoretical. Trust and reputation are considered 'subjective probabilities by which an individual, A, expects that another individual, B, performs a given action on which its welfare depends' (Gambetta, 1988). Trust and reputation are not the result of a mental state of the agent in a cognitive sense but the result of a more pragmatic game with utility functions, and numerical aggregation of past interactions» (Sabater & Sierra, 2005)
Comment: Gambetta (1988) definition of trust as "*a particular level of the subjective probability with which an agent will perform a particular action*" is widely used in Trust and Reputation literature. Actors are rational agents acting according to utility functions obtained with repeated games as in

game theory (e.g. prisoner dilemma), as rightly pointed by Sabater and Sierra. We can deduct that the aggregation of utility functions (as in micro-economics) for different trustors (A, B, C...) toward the same trustee (X) provide the aggregated global reputation score for the trustee (X).
3. Taddeo "referral-based trust": «This kind of trust is based only on communication processes. It is the kind of trust that one develops in an unknown agent by considering only the recommendations about that agent provided by other agents or by other information sources, such as newspapers or televisions. Referential trust is one of the main kinds of trust developed in digital environments in which communication processes are easily performed» (Taddeo, 2010b)   ----   «Taddeo's analysis of trust focuses on Kantian perfectly rational agents, who quantitatively assess the potential trustee's trustworthiness on the basis of the trustee's past performances—its reputation.» (Turilli, Vaccaro, & Taddeo, 2010)
Comment: For Taddeo Reputation (or e-Trust as she calls this) is based on referrals of actors (either human or artificial such as MAS). As pointed out in the second quotation, her view on Reputation considers actors as pure rational agents acting on an assessment of the Trustee recommendations given by other sources. Here, actors act less based on utility functions and more on " a Kantian regulative ideal of a rational agent, able to choose the best option for itself, given a specific scenario and a goal to achieve." (Taddeo, 2010a, p. 244)

Table 1 – Online Reputation and Methodological Individualism

We clearly see the role of Methodological Individualism and rationalism in theorizing about online reputation. However, from an STS point of view, this approach appears to be reductive. Latour (2005) opens his book *Reassembling the Social* as follows: «*when social scientists add the adjective 'social' to some phenomenon, they designate a stabilized state of affairs, a bundle of ties that, later, may be mobilized to account for some other phenomenon*». For Latour, often Social theories preventively carry with them explanations of social phenomena. Callon (1986) stated as a methodological principle of Actor-Network Theory that we cannot with our theories decide in advance the essential properties of actors (e.g. that they are rational) or how social phenomena take place (e.g. with aggregation of rational agents actions). An STS approach to reputation different from that of Methodological Individualism should be possible. I propose to study the concept of reputation using the '*assemblage theory*' proposed by DeLanda (2002, 2006 and 2010).

3. Assemblage theory

The concept of assemblage takes a realist stance emphasizing that social and natural phenomena should be conceptualized as the dynamic result of historical relations among empirical entities. An assemblage is a whole that can be composed of a variety of things

such as people, objects, texts and so forth and whose aggregation in meaningful phenomena (such as network, cities, communities) depends on an assembly process which is historical, immanent and emergent. The key point here is that the final shape of an assemblage cannot be predicted from its initial conditions, from the essential properties of the entities composing it or from a set of deterministic rules by which aggregation takes place. The assemblage theory in DeLanda's terms is an antiessentialist ontology which solves some of the shortcomings of micro and macro forms of reductionism in Social Sciences. With regard to micro-reductionism DeLanda (2010, p. 3) argued that: «*A crucial question confronting any serious attempt to think about human history is the nature of the historical actors that are considered legitimate in a given philosophy*».

For DeLanda the traditional notion of social actor in Social Sciences is based on a microreductionism of social relations (i.e methodological individualism), that considers actors as either rational agents or micro-phenomenological experiences. The assemblage theory proposes the notion of **emergent properties** of assemblages (DeLanda, 2010, p. 3): «*properties of a whole that are not present in its parts: if a given social whole has properties that emerge from the interactions between its parts, its reduction to a mere aggregate of many rational decision makers or many phenomenological experiences is effectively blocked*». Methodological individualism considers wholes as mere aggregates of parts possessing definite essential properties (e.g. rational agents), but assemblages are wholes whose properties are emergent and do not directly depends on the property of the parts, but from the interactions among parts.

This leaves the door open to forms of macro-reductionism of "traditional" social wholes (concepts such as social structure, social system etc.), in which relations among the parts composing the whole are necessary and not contingent. For instance the concept of system implies necessary relations between the whole and the parts, to the extent that a change in one relation will necessarily cause a shift (if not failure) and a change in the system equilibrium. The concept of **relations of exteriority between parts** (opposed to necessary relations of interiority) characterizes assemblages: «*Unlike wholes in which "being part of this whole" is a defining characteristic of the parts, that is, wholes in which the parts cannot subsist independently of the relations they have with each other (relations of interiority) we need to conceive of emergent wholes in which the parts retain a relative autonomy, so that they can be detached from one whole and plugged into another one entering into new interactions*» (DeLanda, 2010, p. 3).

The two concepts - emergent properties and relations of exteriority - allows to define social wholes (DeLanda, 2010, p. 4): «*that cannot be reduced to the persons that compose them, and that, at the same time, do not reduce those persons to the whole, fusing them into a*

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totality in which their individuality is lost».

4. Reputation and assemblage theory

Although the assemblage theory is not directly related with reputation, it is possible to identify the grassroots of a reputation theory from some passages of DeLanda's work. These initial reflections will not be definitive but constitute a first exploration of the issue. Short and not very elaborated mentions to the concept of *Reputation* are dispersed in DeLanda's works. Perhaps the key passage for developing an assemblage Reputation theory is the following (DeLanda 2010, p. 4):

> Take for example the tightly-knit communities that inhabit small towns or ethnic neighborhoods in large cities. In these communities an important emergent property is the degree to which their members are linked together. One way of examining this property is to study networks of relations, counting the number of direct and indirect links per person, and studying their connectivity. A crucial property of these networks is their *density*, an emergent property that may be roughly defined by the degree to which the friends of the friends of any given member (that is, his or her indirect links) know the indirect links of others. Or to put it still more simply, by the degree to which everyone knows everyone else. In a dense network word of mouth travels fast, particularly when the content of the gossip is the violation of a local norm: an unreciprocated favor, an unpaid bet, an unfulfilled promise. This implies that the community as a whole can act as a device for the storage of personal reputations and, via simple behavioral punishments like ridicule or ostracism, as an enforcement mechanism.

Here DeLanda is taking "tightly knit communities" as an example of assemblages. We can deconstruct this statement identifying the initial elements for an assemblage approach to reputation. DeLanda, in my view, argues at least six important things:

1. There is a relationship between the density of an assemblage and the personal reputation of the entities composing it. It is not yet clear what this relationship is and what this implies, but apparently the density of the assemblage is directly proportional to the efficiency of the assemblage in enforcing norms.

2. Density is an **emergent property** of assemblages, which cannot be reduced to specific essential traits of the entities composing the assemblage.

3. Density is not an absolute value but rather the "degree" in which entities are linked together.

4. The relationship between "density" and "personal reputation" is that between the whole and its parts. We can argue that personal reputation is based on **relations of**

exteriority.

5. Personal reputation is (somehow) stored in assemblages: there should be therefore some sort of storage mechanisms that assemblages use to store reputation of members.

6. The density can be calculated using Social Network Analysis (SNA) techniques. In another work DaLanda (2006) explicitly recalls that SNA analyzes relations of exteriority of networks without accounting for properties of entities composing the network.

Notes

1. http://oxforddictionaries.com/view/entry/m_en_gb0702720#m_en_gb0702720

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