

Reviewing the Actor–Network Theory

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ACTOR-NETWORK THEORY

Actor-network theory (ANT) is usually intended as a powerful conceptual tool to study, analyse, describe and explain socio-technical systems. These systems are built up by the interactions between humans, technology, social entities and organizations. These heterogeneous actors in dynamic interaction built networks of interaction, negotiation. ANT emanated from the science and technology studies (STS) field and is considered to be in the broad domain of social networks. Michel Callon and Bruno Latour, STS academics of the École Supérieure des Mines de Paris, are their uncontested continental parents. We can report John Law, in Lancaster University, as the leading British key proponent of ANT from the very beginning. Lancaster University provides a lot of papers' references and sources on ANT in their site (see references).

Actor-network theory is not exactly a theory, neither it is a methodology (Latour, 1998); we would say ANT is an approach, a paradigm, eventually a conceptual tool embedded in a constructivist paradigm. ANT is an interesting analytical framework to understand the role of science and technology in structuring actions in complex socio-technical systems.

We think ANT can offer valuable insights on complex heterogeneous systems and we also think that it can go far beyond study, analysis, description and explanation of facts, but in this encyclopaedia entry, we will mainly address the common understanding on the subject.

Taking both humans and non-humans as actors, ANT dissolves two dualisms: between human and technical artefacts, and between “network” and “actor”. An actor-network is composed of heterogeneous elements, animate and inanimate, linked to one another for a certain period of time. Actor-networks rise up and dissolve themselves as part of their life cycle. They can, at any moment, redefine their identity and the dynamic of their actor relationships in new ways, as they can irradiate elements or bring new ones into the network. An actor-network is simultaneously an actor whose activity

is networking heterogeneous elements, and a network that is able to redefine and transform the actors in the pursuit of goals, says Michel Callon (1987).

In the pursuit of these goals actors negotiate, dispute views, influence others behaviour (*enrol*), and finally align (or not) to common objectives. The process of negotiation, disputing and finally aligning is ended by two main ANT operations: translation and inscription.

Translation involves the definition of roles, the identity and behaviour of actors, their possibilities of interaction and margins of manoeuvre, states Callon (1986). Using translation, actors negotiate between themselves and displace others to follow a defined behaviour. With translations actors inscribe patterns of behaviour in others, namely in technological artefacts, assuring a stable behaviour from their part, with predictable reactions. With the combined dynamics of these two operations (translation + inscription) actor-networks emerge, aligned with ongoing goals, eventually crystallizing into *black-boxes*.

Actors construct their purposes within networking and they never represent anything relevant by themselves. They only materialize through action and interaction in the context of their networks.

ANT contributes to the ‘unpacking’ of heterogeneous networks of aligned interests (at the cost of suppressing actant’s conceptions, tensions and contradictions) and to the tracking of delegation and distribution, as stated by Silva (2006).

ACTOR-NETWORK THEORY BASIC PRINCIPLES

Actor-network theory was conceptually constructed over three main principles that rule the overall congruence and homogeneity among concepts. These structural ANT principles, as stated by Michel Callon (1986, pp. 200–222) in his seminal paper on the subject (probably the most extensively quoted ANT paper ever), are the following:

- **Agnosticism:** Impartiality between actors engaged in controversy. With agnosticism ANT entails a specific style, accommodated both through impartiality between social and technological, and through impartially observation of the actors: “No point of view is privileged and no interpretation is censored” (Callon, 1986, p. 200)
- **Symmetry:** A commitment to explain conflicting view points in the same terms. Actors, whether they are social, technical, material, or immaterial, are treated equally, described with the same language and following the same principles.
- **Free association:** “An abandon of all a priori distinctions between the natural and the social,” (Callon, 1986, p. 200). The ‘reference’ actor follows the actors, observing and identifying the way they define and redefine and associate within themselves. There are no actor’s a priori categories.
- **Network:** Network should not be seen as an infrastructure but much more as a “space” of transformations. ANT networks are something immaterial, not infrastructural, but observable, with boundaries and missions. Actors and networks are not to be seen as two things—like individual and society—but rather as two faces of the same phenomenon (also a reconciliation of social systems dichotomies). In “On Recalling ANT,” Bruno Latour (1998) turns down all the terms used: actor, network, theory, and lastly, the hyphen that sometimes exists between actor and network. He does so fighting the potential of all these terms to create misleading senses.
- **Theory:** Following Latour’s ideas of the precedent paragraph, ANT is not a theory. Although the significance of the word theory is context dependent, in science it generally means a proposed description, explanation, or model, capable of predicting future occurrences. So, in scientific terms and means, ANT is not a theory. It is much more a paradigm—a way of thinking about action and ongoing interactions.
- **Prescription:** Defines what a system allows or does not allow its actors to perform in order to achieve pre-established goals.
- **Inscription:** The reverse of description, it is the programming of the roles of the actors; it is by inscriptions that actors define their roles.
- **Description:** Analysis of the actor’s behaviour in their network settings.
- **Translation:** A way of describing action, knowledge, cultural practices and technological artefacts (Callon, 1975; 1986). Translation is the most important operation in ANT. According to Callon (1986) it evolves in four main phases: Problematization, interessement, enrolment, and mobilization.

Furthermore, we could also refer to the *due process*, described by Bruno Latour (1986), as a contextual community principle embedded in ANT. The actors in the network are the ones accepted through a due process.

ACTOR-NETWORK THEORY BASIC CONCEPTS

- **Actant:** “That which accomplishes or undergoes an act” (Greimas, 1984, p.322). In Latour’s constructivism, he describes the principles of *ir-reductions* and trials of strength, an ‘associology’ by which *actants* are understood to connect with each other, resist each other and gain strength by associations.
- **Actor:** Actants resist each other and change through narratives and, as they acquire roles, they became actors. An actor is an actant with identity. An ‘actor’ in ANT is something that acts or to which activity is granted by others. It implies no special motivation of human individual actors, nor of humans in general (Latour, 1986). Actors can be people, groups, organizations, rules, laws, programs, technological artefacts, whatever that acts and that with its action influences the flow of new action or the system’s behaviour.

Translation Phases

Problematization represents a moment in which “the researchers sought to become indispensable to other actors by defining the nature and the problems for the latter and then suggesting that these would be resolved if the actors negotiated the ‘obligatory passage point’ of the researcher’s program of investigation” (Callon, 1986, p.196). Problematization is like selling to the relevant stakeholders (actors) the idea that a problem

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