Back to Erectus or towards collective Sapiens

Pier Francesco Moretti – 15 March 2020

Facing unexpected, unpredictable or unprecedented situations, it requires decisions about action. Especially if these situations make us suspect or perceive that they may endanger our short-term survival or what we believe it can impact indirectly in the medium and long term. If the timescale for decision is shorter compared to the evolution time of the situation itself, i.e. a serious injury or an earthquake, we rely on instinctive reactions, mainly based on archetypal reactions driven by the successful evolution of our species on planet Earth, or related to training. These two reactions are therefore based on an intrinsic "algorithm" of our body or on procedures related to past cognitive experience.

Consequent actions are therefore "usual / incremental", or linked to the identification of solutions adopted in analogous situations, or innovative, where the risk of failure increases but accepted on the basis of an evaluation of pros and cons and, above all, of the assumptions and models taken to predict the consequences.

We are now facing an emergency: the covid-19.

The big difference from past epidemics, such as the famous pests or the so-called Spanish of the early 1900s, is that we are now in a drastically interconnected world, in terms of access to information and of people's mobility. In practice, the concepts of time and space have revolutionized: from an environmental situation in which events took place limited in space and subsequent in time, to one in which they occur simultaneously and everywhere. Simultaneously in this case means with timescales much shorter than those needed to react.

Then there are two other aspects that are often forgotten in the analysis supporting decisions:

1) we are hominids, evolved in restricted environment (families, tribes, villages) with relatively slow evolutions in comparison to life duration. Environments slow enough to made us usually adopt a deterministic approach, which is based on the concept of cause-effect. We are also social, that is we have different interactions with other individuals and groups, but the maximum number of independent interactions that we can manage is just over a hundred and is linked to the size and shape of our brain (this is the so-called Durban number);

2) our network of interconnections has expanded enormously with the internet and the new industrial system, making the system in which we live “complex”. Complex does not mean complicated, and although it is still based on the cause-effect concept, interconnections are so many and with feedbacks, that it becomes very difficult to foresee the future evolution and, above all, to control it. Moreover, looking at the past experiences is mainly useless: in fact for real complex systems, you are unable to learn much from history, since situations changed their conditions and the probability to find a "useful" analogue to teach us something…is infinitesimal (this is the lemma of Kac).

We are in a small world network situation, consisting of a series of groups that are connected to each other in such a way to result as global: an internet of people. This is the reason why in this period,

individuals are asked to cut bridges with others, to prevent the transmission flow from making the whole information as global. And this must be done in a shorter time than the diffusion one: let's imagine that a news is spread in a family, then a son reports it to the class at school and the mother to her work colleagues, at the first step the number of "informed / infected" individuals can already reach several dozen. If it is repeated even once, the number increases dramatically, just remaining restricted only to verbal communication. In principle, an experiment from past years has shown that anyone on the planet can be reached from another in just six steps.

It is only a matter of time. Unless you break the chain, and keep it interrupted or change the information.

Small world network topologies are considered very robust, in the sense that it is difficult to attack and destroy them: in fact, it takes time to identify the most connected bridges and isolate them before the attempt is made vain.

Some years ago, It was announced that the greatest risk to the human species was no longer a nuclear war but a pandemic. The substantial difference is not in the destructive character of the single event, but, above all, in the fact that the atomic bomb has always remained in the capacity of a few and with a technology that is difficult to be reproduced by singles. The risk management for a nuclear war is therefore based on an extremely hierarchical and controllable topology. The risk lies mainly in the launch decision mode.

In the actual case, the system is indeed extremely dynamic and widespread, and each individual can influence the evolution of the system, if, and only if, it is synchronized and coherent with the others. The ways of attacking a small world network are a) blocking the transmission between groups, activating complete, simultaneous and persistent isolation, and in this case the boundary of the group must be identified to make it independent and at the same sustainable, b) modify information or change its meaning, that is in the case of viruses, waiting for a less lethal mutation, or waiting for most groups to have self-immunized, or fighting with a vaccine.

It has also been shown that the behavior of animal groups can largely depend on the guidance of a few, and that these leaders, as the number of individuals in the groups increases, does not necessarily increase, provided they are adequately credible, informed and trained. In this case, the system can assume random topologies, but functional to the survival of the groups themselves. The groups of animals in question are not sapiens.

The required synchronization and coherence can be based on simple commands and executed with discipline and automation, or, building harmony and orchestration. Sapiens have few options.

See also http://www.pierfrancescomoretti.eu/news_archive/news_virus_eng.pdf