

The Digital Revolution as a Fourth Revolution

Oversimplifying, science has two fundamental ways of changing our understanding: one extrovert, or about the world, and the other introvert, or about ourselves. Three scientific revolutions have had great impact both extrovertly and introvertly. In changing our understanding of the external world they also modified our internal conception of who we are. After Copernicus, the heliocentric cosmology displaced the Earth and hence humanity from the centre of the universe. Darwin showed that all species of life have evolved over time from common ancestors through natural selection, thus displacing humanity from the centre of the biological kingdom. And following Freud, we acknowledge nowadays that the mind is also unconscious and subject to the defence mechanism of repression. So we are not immobile, at the centre of the universe (Copernican revolution), we are not unnaturally separate and diverse from the rest of the animal kingdom (Darwinian revolution), and we are very far from being purely rational minds entirely transparent to ourselves (Freudian revolution).

Freud was the first to interpret these three revolutions as part of a single process of reassessment of human nature, and his perspective was blatantly self-serving. But replace Freud with neuroscience, and we can still find the framework useful to explain the widespread intuition that something very significant and profound has recently happened to our self-understanding. Since the fifties, computer science and ICTs have exercised both an extrovert and an introvert influence, fundamentally changing not only our interactions with the world, but also our essential views about who we are. We no longer interpret ourselves as standalone entities, but rather as interconnected informational organisms or *inforgs*, sharing with biological, artificial and hybrid agents and engineered artefacts a global environment, ultimately made of information, the *infosphere*. This is the informational environment constituted by all informational processes, services and entities, thus including informational agents as well, their properties, interactions, and mutual relations. The digital revolution is therefore best understood as a fourth revolution, in the process of dislocation and reassessment of our fundamental nature and role in the universe. As far as we know, we are the only semantic engines in the universe. We were born to be *inforgs* and we have been pursuing our informational agenda relentlessly at least since the Bronze Age, the era that marks the invention of writing in Mesopotamia and other regions of the world (4th millennium BC).

The digital revolution is updating our everyday perspective on ourselves and on the ultimate nature of reality, that is, our metaphysics, from a materialist one, in which physical objects and processes play a key role, to an informational one. Objects and processes are increasingly seen as de-physicalised, in the sense that they tend to be treated as support-independent (consider a music file). They are typified, in the sense that an instance of an object (my copy of a music file) is as good as its type (the music file of which my copy is an instance). And they are assumed to be perfectly clonable by default, in the sense that my copy and your original become interchangeable. Less stress on the physical nature of objects and processes means that the right of use is perceived to be at least as important as the right to own. P2P does not mean Pirate to Pirate but Platonist to Platonist, for it is the immaterial nature of things that underpins the phenomenon. Finally, the criterion for existence – what it means for something to exist – is no longer being actually immutable (the Greeks thought that only that which does not change can be said to exist fully), or being potentially subject to perception (modern philosophy insisted on something being perceivable by the five senses in order to qualify as existing), but being potentially subject to interaction, even if intangible. To be is to be interactable, even if the interaction is only virtual.

A significant consequence is that we are fast moving towards a commodification of objects, which considers repair as synonymous with replacement, even when it comes to entire buildings. This has led, by way of compensation, to a prioritization of informational branding and of re-appropriation: the person who puts a sticker on the window of her car, which is otherwise perfectly identical to thousands of others, is fighting a battle in support of her individualism. The fourth revolution has further exacerbated this process. Once our window-shopping becomes Windows-shopping and no longer means walking down the street, but browsing through the web, our sense of personal identity starts being eroded as well. Instead of individuals as unique and irreplaceable entities we become mass-produced, anonymous entities among other anonymous entities, exposed to billions of other similar inforgs online. So we self-brand and re-appropriate ourselves in the infosphere by using blogs and flickr albums, homepages and youtube videos. There is no inconsistency between a society so concerned about privacy and the success of services such as Facebook. We use and expose information about ourselves to become less informationally anonymous. So we wish to maintain a high level of informational privacy because we wish to save a precious capital that can then be publicly invested by us in order to construct ourselves as unique individuals, discernible by others.

All this is part of a deeper metaphysical drift caused by the fourth revolution. During the last decade or so, we have become accustomed to conceptualising our life online as a mixture between an evolutionary adaptation of human agents to a digital environment, and a form of post-modern, neo-colonization of that space by us. Yet the truth is that the digital revolution is as much changing our world as it is creating new realities. The threshold between *here* (analogue, carbon-based, off-line) and *there* (digital, silicon-based, online) is fast becoming blurred, but this is as much to the advantage of the latter as it is of the former. The digital is spilling over into the analogue and merging with it. This increasing informatization of artefacts, identities and of whole (social) environments and life activities suggests that soon it will be difficult to understand what life was like in pre-digital times and, in the near future, the very distinction between online and offline will disappear. The common experience of driving a car while following the instructions of a GPS clarifies how pointless asking whether one is online has already become. To put it dramatically, the infosphere is progressively absorbing any other space. We live "onlife" and your Nike and iPod have been talking to each other for some time.

At present, older generations still consider cyberspace as something one logs-in to and logs-out from. Our view of the world (our metaphysics) is still modern or Newtonian: it is made of "dead" cars, buildings, furniture, clothes, fridges, which are non-interactive, irresponsive and incapable of communicating, learning, or recording. But in advanced information societies, what we still experience as the world offline is bound to become a fully interactive and more responsive environment of wireless, pervasive, distributed, *a2a* (anything to anything) information processes, that works *a4a* (anywhere for anytime), in real time. As a consequence, we shall be living in an infosphere that will become increasingly synchronized (time), delocalised (space) and correlated (interactions). This will first gently invite us to understand the world as something "a-live" (artificially live). Things are increasingly less inanimate, yet their new "souls" are digital. This digital animation of the world will then, paradoxically, make our outlook closer to that of pre-technological cultures, which interpreted all aspects of nature as inhabited by forces. Only Odysseus could string his mythical bow. Today, only a user wearing a special ring with a unique matching code can unlock the trigger of an iGun™.

Because of this informational reconceptualization of our metaphysics, it will become normal to consider the world as part of the infosphere, not so much in the dystopian sense expressed by a *Matrix*-like scenario, where the "real reality" is still as hard as the metal of the machines that inhabit it; but in the evolutionary, hybrid sense represented by an environment

such as New Port City, the fictional, post-cybernetic metropolis of *Ghost in the Shell*. At the end of this shift, the infosphere will have moved from being a way to refer to the space of information to being synonymous with reality.

Previous revolutions (especially the agricultural and the industrial ones) caused long-term, macroscopic transformations in our social structures and physical environments, often without much foresight. The digital revolution is no less dramatic. We shall be in trouble if we do not take seriously the fact that we are constructing the new environment that will be inhabited by future generations. The best way of tackling the new ethical challenges posed by the digital revolution is probably from an environmental approach, yet not one that privileges the natural or untouched, but one that treats as authentic and genuine all forms of existence and behaviour, even those based on synthetic and engineered artefacts. This sort of *synthetic e-nvironmentalism* requires a change in our perspective about the relationship between *physis* (nature, reality) and *techne* (practical science and its applications).

Whether *physis* and *techne* may be reconcilable is not a question that has a predetermined answer, waiting to be divined. It is a practical problem, whose feasible solution needs to be devised. With an analogy, we are not asking whether two chemicals could mix but rather whether a marriage may be successful. There is plenty of room for a positive answer, provided the right sort of commitment is made. Undoubtedly, a successful marriage between *physis* and *techne* is vital for our future and hence worth our sustained efforts. Try to imagine the world not tomorrow or next year, but next century, or next millennium: a divorce between *physis* and *techne* would be utterly disastrous both for our welfare and for the wellbeing of our habitat. Something that technophiles and green fundamentalists must come to understand is that failing to negotiate a fruitful, symbiotic relationship between technology and nature is not an option.

Fortunately, a successful marriage between *physis* and *techne* is achievable. True, much more progress needs to be made. The physics of information can be highly energy-consuming and hence potentially unfriendly towards the environment. But the digital revolution can help us in our fight against the destruction, impoverishment, vandalism and waste of both natural and human resources, including historical and cultural ones. We should resist any Greek tendency to treat *techne* as the Cinderella of science; any absolutist inclination to accept no moral balancing between some unavoidable evil and more goodness; and any modern, reactionary, metaphysical temptation to drive a wedge between naturalism and constructionism, by privileging the former as the only authentic dimension of human life. The challenge is to reconcile our roles as informational organisms and agents within nature,

and as stewards of nature. The good news is that this is a challenge we can meet. The odd thing is that we are slowly coming to realise that we have such a hybrid nature. The turning point in this process of self-understanding is what I have defined above as the *fourth revolution*.