

Beyond systems: in search of poietic thinking

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In pursuing the debate on technology and society, we may observe how seeing technological worlds as cultural visions enables us to reflect on the paradoxical process of viewing technology as part of a hope for a more sustainable and human-centred future, and as an instrument of surveillance, violence and catastrophes. At the same time, we wonder whether we are witnessing an historic re-materialisation within the new digital economy, dominated by the culture of standardisation and technological determinism, resulting in cognitive and material divisions. A further thinking on these arguments leads us to reflect on how self could be perceived in the ubiquitous environment, and whether selves distributed across information networks could essentially be constituted through information, and what that implies for any boundary between the self and the other. This continuing march of the intrusion of immersive technologies in our lives at times makes us feel displaced, distracted and fragmented in the cyber space, but at the same time invites us to see our identities in newly responsible, intricate and open-minded ways, opening up dimensions of diversity, plurality and contingency.

This paradox is disbursing the established architecture of system thinking, and even showing strains of systemic thinking in coping with the opening of doors of new possibilities and closing of windows of freedom. There is a wide ranging concern whether prevalent intellectual architectures, organisational structures and policy institutions are geared towards coping with distributed selves, identities, affiliations, commitments and even locations. Muligan (2014) makes a case for systemic thinking as an operational framework to study the complex challenges of

our century. Building upon Maturana's concept of auto-poiesis—'the insight that all living things exist in order to exist, and create themselves', systemic thinking seeks a balance between rationality and emotion, the object and its environment, the part and the whole, and between the self and the other. Muligan (2014) makes a case for systemic thinking in gaining insight into some of the central questions of our times such as: 'how do you bring the parts of a system together to sense themselves as one system?; how do you encourage the people in a system to share a diagnosis of what's wrong?; to design improvements?; to rewire the connections between the parts of a system?; and then to make the leap to a new way of doing things?' He notes that this sort of change is always as much a question of emotion and relationships as it is of rational design. However, he says that this change can be described, and to a degree planned and managed. He further brings to our notice, 'life ratio', as a measure of autopoiesis. This measure tells us how much the complexity of a system is defined by itself and how much is defined by its environment. If we follow the implication of this measure, we may argue that it limits the scope of systemic thinking in the sense that it focuses on the disjunction between the object and its environment rather than on the dynamic interplay between the object and its environment, a relational conjunction between the object and what Sha (2013) calls, the 'stuff'. There is thus a concern that when systemic thinking is subjected to measurement, it may follow a planned and managed path. In other words, in following a rule-bound path, it may fail to deal with uncertainties which may arise during the process of systems design. Instead of recognising and using uncertainties as opportunity for creative solution, the planned and rule bound path may try to eliminate them. In this scenario, we are then back to a mechanistic vision of system thinking, the well-trodden

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path of system analysis, seeking the ‘one best’ solution. In the human-centred tradition, one may be tempted to say that the systems path chosen very much depends upon our purpose whether we are seeking to design a tool or a machine, in other words it is a question of purpose which path technology design takes. A system entrepreneur may take a contrarian view and argue that whatever the nature of technology, there always exist cultural entrepreneurs, ‘cultural demons’, who are active in trying to exploit or even bypass systems restraints and boundaries in creating unexpected novelties in designing technological system and tools.

In the pursuit of designing technological systems and tools, we should also be aware that, however, technically competent these systems may be, they invariably come with vulnerabilities, defaults and brittleness, and their malfunctioning cannot be anticipated. A system, even a technically competent technological system, is as effective as its weakest component. Any complex technology-mediated system should leave at least some windows open for dealing with uncertain, unforeseen and unanticipated situations and systems vulnerability gaps. There is also a concern that the process of designing the tool does not lead to the weakening of human presence in the transformative cycle of interaction, mediation and interlocution. This weakening of the human presence, or we may call it ‘human window’, is a step towards closing doors of freedom, a freedom to engage with, influence and shape the cross-appropriation process.

In addition to these concerns about the limit of systems thinking, technological constraints and the weakening of human presence, we should also be mindful of the hold of the computational model of mind on technology design, the hold of the ‘one best way’ view of problem solving, and the hold of scientific rationality on the dominant intellectual frameworks. What is of interest to us here is that the emergence of the ubiquity of the Internet and digital media in society is already making us not only recognise the limitations of the scientific rationality in dealing with complex issues arising from the interplay between our spatial being and virtual presence, but also question the dominant view of systems thinking itself. If we were to transcend these limits, we need first to recognise that the roots of these limits lie in the rationality of the separation of the object from its environment, seen through the lens of a disjunction between art and science.

It is interesting to observe that a variety of cross-disciplinary collaborations are engaged in transcending the art-science disjunction and are creating conceptual architectures for exploring the conjunction of art, technology and science. These collaborations are giving an expression to this cross-disciplinary conjunction through their work on performance, experiments, simulations, installations and

topological media. We see in this movement a cultural shift from a disjunction of art and science implicit in the object-environment split to a conjunction of art, technology and science that is accepting the continuity of relational interplay between the object and ‘atmosphere’. It may not be just coincidence that as research into cognitive science is moving away from the dominant brain centred conception towards embodiment, embeddedness and situatedness, so is research into mediating technologies moving from transactional interaction to relational communication (Gill 2008). This opening of the cognitive perspective provides a way forward to cultivating the conjunction between arts, technology, science and society, where art is not about the product but about process and the relationship between visual media and society. Art engages us aesthetically in ways that science cannot, where art mediates with society in ways that technology cannot. The interdisciplinary dialogue between art, technology and science opens up new forms of communication to wonder, imagine, relate, mediate and interact. For example, we observe that this conjunction in the form of topological media is giving an expression to this dialogue, giving meaning to practice through performance (Sha op cit.); experimental creative research residing between disciplines and technologies explores how communication technologies affect collective behaviour and how perceptions of identity shift in relation to scientific innovation (Vesna 2014). Interdisciplinary research into art, music, computing and neurosciences is creating tools and architectures for art and music therapy, and rehabilitation; cross-disciplinary architects, artists and AI scientists explore the spatial ramifications of embedded technology and ubiquitous computing, in creating digitally enhanced environments in the areas of health care, building technology and sustainability (Moukheiber 2014). In these interdisciplinary explorations, we see that the emerging conjunction is also opening up opportunities for designing interactive and mediating tools for multidisciplinary domains such as Internet-aided and Internet-mediated environments, collective intelligence, distributed cognition, distributive learning, intelligent civic media, interactive consumer relations, mediated presence, cross-cultural communication, deliberative decision-making, computer-mediated therapeutic and mediation environments, interactive art and architecture.

However, if we were to seek creative and imaginative solutions to complex societal problems through shaping ‘technologies designed to intervene in the unruly real world’, we would need to not only bypass systems constraints but may also need to rethink or recalibrate systems thinking itself. The emerging conjunction of art, technology, science and society should be seen more than just designing technologies of intervention, and it should also be seen as making of a conceptual architecture for the

evolution of a new way of thinking beyond systems. This new way of thinking is social, cultural, political, physical, imaginary and experiential in time and space, and I call it as *poietic thinking*.

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