

Innovation and Technical Transformations in Living Technology: An Entanglement of Agentised Matter, ANT, and Natural Computing

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ABSTRACT

This essay proposes that humans are in the midst of a cultural shift from the Industrial Age to an Ecological Era, which demands that one re-conceptualize the world and operate within it differently. It discusses the opportunities raised by Actor Network Theory (ANT) in helping one navigate the transition from an object-centred view of reality, towards one that also engages with process-oriented concepts. In particular, the impact of the convergence of these worldviews on technological innovation is explored through recognising a different material framework that engages with nonlinear systems. ANT offers a unique opportunity to deal with matter at far from equilibrium through the notion of assemblages, which act as a new kind of operating system that behaves in remarkably lifelike ways. Empirical evidence is provided for such an ANT-based, production platform through laboratory findings in an emerging field of computation called 'natural' computing. A range of models and prototypes are discussed. The resultant lifelike technologies require unique infrastructures that facilitate the movement of elemental fabrics (earth, air, heat, water). While much evidence for their existence is propositional and qualitative, as they are in their earliest stages of development, these lifelike technologies have the potential to radically alter the impact of human development and transform it from being harmful to beneficial to the environment.

Keywords: Assemblage, Bioprocesses, Lifelike, Living Technology, Natural Computing

1. INTRODUCTION

This paper positions the role of ANT as forming a context in which new forms of technological innovation can emerge that are qualitatively different than machines. As such, ANT offers

a critical framework for facilitating radical breaks with the developmental platforms that have characterised human civilization to date.

We are at the breaking wave of a paradigm shift in how we live as we transition from an Industrial Age to an Ecological Era. For the

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first time in a couple of millennia, the general populace of Western civilization has embraced the idea that reality is in a state of constant flux. While much debate exists within academic circles, the impacts of these practices are not simply for an educated elite but impact on a wider society. This perspective has been catalysed by the explosive impact of the Internet and is more than an attitude - but a game-changing in the way we view the world. It affects every aspect of our lives from the way we live to how we solve problems. Yet, we're suffering a kind of disorientation as on an everyday basis, our thoughts and actions slip between different models of experience, like fish that don't know we're wet. On the one hand most of us are steeped in the classical Western traditions and tools of atomism, Enlightenment and modernity - while we have also become fully engaged with the Pandora's box of process and systems that characterize a Heraclitean reality. In the last thirty years this has slipped around us through our online encounters, in the phenomenon of globalization and by virtue of our increasingly turbulent weather patterns. Let me be clear, this is not simply about replacing one hegemony with another, but implies our deep immersion in simultaneous realities, where experiences are compound being forged through converging fields of interaction that simultaneously obfuscate, create and delight.

This cultural transition may be thought of as an Ecological Era because of its allegiance with a set of concepts that have been gathering momentum across many different knowledge fields, especially in the last hundred years - across disciplines as diverse as philosophy, cybernetics, ecology, holism, philosophy, mathematics (Gleick, 1997), cultural theory and neuroscience - and have already begun to shape our attitudes. In fact, making a transition towards the Ecological Era is only in part a voluntary decision. It is of no consequence that you prefer a minimalist efficient aesthetic to a naturalistic one. It has very little to do with whether you actually 'believe' in climate change, pride yourself on green citizenship or recycle your trash. Rather the Ecological Era

is borne from our complete immersion within a restless system of change for which we are not yet fully equipped. This often leaves us feeling that we're constantly being asked to nail jellies to walls as we periodically ponder some of the inevitable discontinuities within a process of change.

Look around you and you won't see the Ecological Era directly - but you may observe its symptoms. Perhaps you'll notice solar panels on a south-facing roof, recycling bins tucked behind the parking lots at a supermarket, which vacuum packs its products in 'biodegradable' plastics. Maybe you'll glimpse a headline on your smartphone that more carbon dioxide is pouring into the atmosphere than ever before as a car revs its engine while you wait to cross at the traffic lights, spewing more greenhouse gas into the air. Yet, when you look up, you wonder how this invisible gas relates to the crisscross of plane trails and the barely perceptible geostationary satellite networks and space junk that litter the sky. Perhaps you'll pull your coat around you tightly as for no apparent reason the wind has picked up and head for shelter in a fair-trade coffee shop and feeling warmer, try to figure out how much of your life is informed by scientific fact, urban myths and old habits. Understandably, you may begin to wonder what on earth our contemporary culture is all 'about'.

However, if this transition is to be more than cultural purgatory - where it is simply a matter of time before our dominant object-centred worldviews re-group and re-present their established reality using a new set of arguments, which has been our strategy for the last two thousand years - then the context in which these changes are being played out needs to change. In other words, we need a conceptual and practical toolset that enables us to act upon, experiment with and implement the consequences of new ways of seeing. In short, a new technological platform is needed if we are truly going to seize the opportunities provided by being able to imagine the world in different ways - so that we can increase the range of options through which we can construct new futures.

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