Climate Justice and Information Technology: A Framework for Making a Difference

Introduction

According to Gregory Bateson, information is a difference that makes a difference. What kind of information can make a difference where climate is concerned? Can information technology – ever more advanced in storing, sifting, and communicating information – empower us to make a bigger difference in responding to the global climate crisis? Also, can information technology guide us in determining if the differences we make are positive and as intended, warning us away from catastrophic side effects of unintended consequences? Such are the questions motivating this study. We envision readers interested in this discussion who want to do the right things where climate justice is concerned. We likewise envision readers who work in information technology, who want to work in information technology, or – like almost all of us – who make use of information technology daily in all manner of personal and professional activities. This study explores leverage and resonance. Which levers will lift the weightiest barriers where climate is concerned? Which calls for climate action will echo loudest and longest as they traverse the global network? How can this document and the thoughts it stimulates in its readers change anything at all where global climate is concerned? To explore such questions, we need to begin by outlining a framework of interlocking systems.

Systems theory goes back quite a few decades. The most recent versions of systems theory address some of the well-known deficiencies of earlier versions. Systems are defined as patterned relationships between constituent components. All well and fine. The problem comes in when we "reify" (grant substantial being to) the systems models we invent. Classic Marxism is a prime example. Was there ever such a thing, really, as the "proletariat"? If so, why did the "proletariat" fail to usher in "socialism" as the model predicted? Literal-minded Marxism is clunky, because it reifies abstract ideas like "proletariat" and "socialism" into "things" with a life of their own. This is not to gainsay models and modeling. Classic Marxism is a potent jumping off point for social historical research and political economic analysis. But models such as these are maps, not territory. To explore the territory, so to speak, we need to pocket the maps and be willing to see for ourselves. If details of the landscape thus discovered look different than the map suggests, the most appropriate response is to revise the map. Early versions of systems theory lend themselves unfortunately to static, reified mapping projects. Current systems theory – rising from decades of social, biological, engineering, and conceptual analysis – takes pains by contrast to underline the permeability and evanescence of systems. Systems models need to be flexible and accommodate changes in the underlying relationships they attempt to capture and describe, because reality itself appears very much in motion.

Systems involve patterned relationships. These relationships imply processes. Processes change things. Processes change system components and even the systems themselves. For this reason, current systems models carry descriptions such as Complex Adaptive Systems (CAS). Complex, because reality is infinitely granular and uncountable. CAS does not envision some master equation to predict the fate of the world. CAS theory starts where linear mathematical projections can no longer function. CAS models a world of positive and negative feedback loops, butterfly effects, and the chaotic emergence of the unexpected. Chaos is not just random noise. Chaos is not absurdity. Chaos simply implies deeper

currents of causality than simple linear models can fathom. How do we know that chaos is compatible with structure we can grasp? Well, look around! Somehow birds and mountains and trees all got here. So did you and I. Complex Adaptive Systems have both histories and futures. That's the Adaptive part. So we can model the world as a nested mesh of complex interlocking systems, each of which adapts to both its environment and to its own internal rhythms. Systems "exist" only as models for complex dynamic processes. Why do these models "exist"? Because the complex adaptive system that is human cognition works best when it can frame reality in meaningful, intelligible patterns. Cognitive theorist John Veraeke calls this relevance realization. We separate signal from noise through the filter of what we consider relevant. CAS, applied to the global ecosystem (humans included) is simply a tool to help us find meaningful signals against a background of indistinguishable noise.

It seems ridiculous that humans chattering with one another (verbally or over the internet) can imagine affecting global climate. The scope of our personal powers seems poorly matched to the global dimensions of climate in flux, but consider, how exactly did humans become the planet's apex predators? How did we drive prehistoric macro-fauna to their species deaths? Why do geologists seriously discuss the "Anthropocene" as the sixth, latest, and on-going global extinction event? It turns out all that human chatter becomes quite potent when captured in writing, linked to technology, applied to sciences, and used to transform the world to our tastes. The histories of the neolithic agricultural revolution, the advent of civilizations, the scientific revolution, and the industrial capitalist expansion of the last several centuries need not be repeated here. We all live in the world created through these processes. But can we live in that very same world much longer? Many begin to doubt. The processes that got us here are unlikely to keep us here. If we wish for human society to remain complex, we need to adapt. We need to evolve. We specifically need to evolve our culture. We now wield tools far more powerful than flint-tipped spears and arrows. But has our aim improved? That is a question of information processing, potentially assisted by information technology.