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# Relevance of N. Luhmann's theory of social systems to understand the essence of technology today. The Case of the Gulf of Mexico Oil Spill

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## ABSTRACT

Technological advancement has dramatically changed the praxis. Nowadays human agents share the phenomenological ground with a variety of social systems, gadgets, cyborgs and human extensions, which modify the conditions of freedom and ethical responsibility. Subjectivity is no longer restricted to the human individual. This article argues that newer modalities of agency are left without proper observation. To this end, the piece offers a general description of the dominant paradigm for understanding technology, featuring intentionalism. Then, the article compares the paradigm selectively with a second perspective, critical-realist analysis of technology. The comparison allows arguing that anthropocentric theories of technology cannot fully apprehend the mode of functioning that current technology has, neither can it fully understand the risks that it entails. The article proposes then an alternative framework using Luhmann's theory of social systems and submits a structural explanation of the Gulf of Mexico's oil spillage to indicate that Bimber's account of technological determinism explains well the technological status of our times.

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## 1. Introduction

This piece is motivated by the current state of technological advancement that entails simultaneously, better and worse possibilities for human action before incremental systemic risks. It proceeds following a composite reasoning. Revolving around the distinction humanity/technology, it first identifies the heuristic value of distinctions. Then, it builds a selective comparison of two major currents in the analysis of technology: intentionalist-anthropocentric views of technology and critical-realist approaches. From this comparison the piece argues that

intentionalist perspectives are insufficient to understand recent developments in technology that create recurrent communications which unfold into new modalities of agency. To this end, the piece uses selectively Heidegger's proposal to understanding the 'essence' of technology, as a disclosure for human praxis. The appeal to Heidegger is ephemeral, as the piece argues that Heidegger is still under the spell of intentionalism and needs to address the actual conditions of technological pervasiveness. Then the piece argues that Luhmann's theory of social systems is best fitted to understand technology. Finally, the article proposes a functional analysis of the Gulf of Mexico oil spill. In the concluding remarks the case shows how sequenced technological determinism is at stake in the current state of systemic risk.

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### 1.1. Introduction and structure

The paper is structured into two major parts and a conclusion. Part One proposes a selective comparison of the two dominant paradigms to understanding technology; namely intentional–anthropocentric perspectives (including SCOT) with critical–realist approaches. Part One is structured into seven concatenated arguments: 1.2. Epistemology of distinctions; 1.3. Perspectivism, episteme and paradigm set the conditions for the analysis; 1.4. The characterization of a dominant paradigm for the analysis of technology identifies the main tenets of the dominant view of technology; 1.5. Scot and intentionalism grant special attention to the social construction of technology and include Scot within intentionalist perspectives of technology; 1.6. Concurrent paradigm: there is something further than direct human agency. Technological determinism strikes back; 1.7. Technological determinism and critical realism, which introduce Bimber's typology of sequenced technological determinism; and 1.8. A third proposal: Luhmann's theory of social systems.

Part Two is composed by dual and concatenated arguments: 2.1. Recalling Heidegger followed by 2.2. Return of Luhmann's theory. Finally, Part Three proposes as a conclusion the need for a different kind of naturalization.

It is important to stress what this piece does not do. It does not offer a thorough examination of theorists assembled under the alluded perspectives. Instead, it uses, selectively, arguments from the chosen theorists to advance the view there is a blind spot in the analysis of technology.

Inspired in Niklas Luhmann's theory of social systems, this piece proposes to see the technological side of the distinction humanity/technology in order to describe the conditions of the technological communication at stake.

The paper reveals how the multiple social systems at stake address the problem from autonomous perspectives, creating overlapping and conflicted communications that fit within Bimber's account of technological determinism, filling with human suffering his theoretical description of a sequenced technology. The piece also shows that emergent features of technological development increase systemic risk that results from the overlapping and conflicting communications that take issue with real-life problems, such as the Gulf of Mexico oil spill.

### 1.2. Epistemology of distinctions

This analysis revolves around the relationship between humanity and technology. Technology is pervasive [1], automatic [73] and it creates the tissue of social life in a distinctive manner, which in qualitatively [47] and quantitatively ([3]:777) ways differs from previous epochs. Technology as we experience it today is only possible because of a multi-layered tissue of symbolizations, institutional ([74]:9) and cultural appropriations that reverberate within the material form of society. From Modernity on, technology makes up daily life and constitutes the tissue of our social life, mostly because people assign meaning to this social tissue [32,69].

Notwithstanding our familiarity with technology, this analysis argues that humanity is ill-prepared to conceive of

technological-systemic risk. A blind spot concerning the status of technological complex systems is the reason. The piece offers a selected comparison of intentionalist–anthropocentric<sup>1</sup> perspectives and critical realist theories on technology, and argues that the dominant paradigm cannot offer clear for an alternative approach based in N. Luhmann's proposal.

Below the complex relationship between technology and humanity underlies a set of conceptual distinctions [44]. These distinctions fit in into two distinct orders: first, heuristic distinctions that define what we can see and our access to knowledge. Second, there are praxical distinctions corresponding to the making of technology and of humanity. In the first order, we find the theories and methodologies that conceive of the technological phenomenon and that define the scope of the observations. Now, we locate distinct fields and disciplines, which create correlative theories of technology. One such field is the philosophical analysis of technology; another is the science–technology–society (STS) movement that precludes the social construction of technology (SCOT); a third is the sociology of techno-scientific knowledge; a fourth is the historical analysis of technology; a fifth is the anthropological analysis of technology; a sixth is the economic analysis of technology; and seventh and finally, there is the futures research on technology.

All of those disciplinary perspectives have made chief contributions to our understanding of technology. Because technology is pervasive, Winner (1986, ch. 1) rightly characterizes it as a life-form. Despite its ubiquity, and because of its double status [48], technology is understood only partially, and the status of technical artifacts is entwined with the issue of agency and intentionality. Notwithstanding the importance of disciplinary contributions, this paper claims that dominant understandings of technology are made from within a dominant paradigm that entails important lacunas of observation. It is argued that outstanding analysis of technology exhibits a tendency [79] to overpower the possibilities of human agency and to disregard autonomous developments of technology that, in a later time, become a burden for human agency. In short, disproportionate credence in humanity's capacities before technology has the paradoxical effect of impeding the observation of technological developments that restrict human agency and, consequently, results detrimental to the view of humanity.

### 1.3. Perspective, episteme and paradigm to situate the analysis of technology

To begin this analysis, it is crucial to situate the topic of technological advancement in respect to the available possibilities for observing it. The problem begins with a

<sup>1</sup> A thorough analysis of the many articles and books that display an anthropic analysis of technology is excluded here. Instead, an outstanding analysis that exhibits this bias was chosen in order to characterize it. The chosen piece is Bijker's (2009) "How is technology made?—That is the question!" *Cambridge Journal of Economics*, 34, 63–76.

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