Frugal Ground for STS and IS: Problems of Innovation and their Commonalities

JUDITH SUTZ
UNIVERSIDAD DE LA REPÚBLICA
URUGUAY

Abstract

The fields of "science, technology, and society" and "innovation studies" may come closer together in a frugally-fruitful way by engaging—with their specific tools—in the comprehension *of* and action *upon* some innovation problems, particularly those involving inequality.

Keywords

Frugality; innovation; science, technology, and society; STS; innovation studies; IS; frugal innovation

Introduction

I am grateful for the invitation to contribute to this collection as an STS scholar, as well as an IS scholar. My perspective is problem-oriented rather than determined by discipline or by field. We live in a world of rising inequality, climate change aggravation, and growing authoritarianism—of which science, technology, and innovation (STI) have contributed to those increases. So, the directionality of STI is a matter of utmost importance as it relates to humanity's survival as well as social justice. Moreover, living in an underdeveloped country, I feel the urgency of re-thinking the meaning of development as well as the role that science, technology, and innovation play in development processes. For that, we need a deeper understanding of STI as a social process and field of politics and policies. The three questions put forward in this *engagement* are suggestions for organizing the contributions to this issue—as proposed by Alan Irwin (2023)—which I also follow as a guiding thread for the reader of the thematic collection.

First Question: When It Comes to Engaging With and Acting Upon Socio-Technical Change, is "Innovation" Part of the Solution or Part of the Problem?

With What Definition of Innovation Should We Work?

Let us start by stating that those engaged *with* and acting *upon* socio-technical change are not only STS people (if we delimit their universe to those that cultivate the themes and approaches accepted by some intellectual gathering) but "innovation people" as well. The latter form a variegate ensemble, loosely woven together by their engagement with the understanding of how "what is new" proliferates—in the Schumpeterian sense; that it changes routines in the ways human beings perform their individual and

collective activities. I think it is a mistake to take one definition of innovation, preferred by some of those belonging to the IS field, and try to answer the first question from that standpoint. Even if we focus on innovation in its commercial sense, as something that comes into being and as if it has passed through market exchanges, then the concept of innovation is far from being univocal. Innovation concepts used to measure innovative activities in business firms are different from those informing debate of intellectual propriety rights. It seems clear that the second concern over innovation may be relevant for both fields, with the first debate seeming more important to one field and not the other. I would say then, that we should think about innovation in a less delimited way, and rather, in terms of "problems of innovation" so as to find common grounds where the concepts, emphasis, worries, and empirical richness of both communities can contribute towards a shared understanding.

Canonical and Unorthodox Innovations

Covid-19 is a "problem of innovation" involving asymmetries of financial, political, and cognitive power, production capabilities, and infrastructure. Covid-19 as a matter of concern (involving open science and international academic cooperation, science communication, and science-policy dialogues) points to a fundamental issue not always stressed—namely, that there is no one solution to any given problem. Alternatives always exist, even if it can be complicated to materialize and/or imagine them. The latter point is not proof of the unicity of innovations but the exertion of economic and ideological power, that presents some solutions as the best and only rational choice, with alternatives being dismissed by arguments of backwardness or "do not reinvent the wheel." We might call these innovations "canonical." In some Southern nations, innovations related to Covid-19 were different from—and equally efficient than—the canonical innovations coming from highly industrialized countries. Studying why these "unorthodox solutions" appeared, the conditions that made them possible as well as likely to disappear (once the pandemic is over), and how to conceive strategies to maintain them in place—is relevant to both STS and IS as well as their intersecting communities.

Development as an Umbrella in Common

We should keep in mind that some scholars might be classified as STS or IS depending on the name of their university departments or by association to the journals where they most often publish, even if substantively they are both. Those scholars may not even care that much about disciplinary identity; but rather address problems with several toolkits to tackling a problem. For some scholars, particularly in the South, the issue of development may provide a common umbrella for the hybridization of STS and IS, even if it is not necessarily so. If we characterize development as catching up with the North, the strand of IS farther away from STS will prevail anywhere. If we conceive of Western science and technology as intrinsically evil for people in the periphery, it can also be postulated, that the strand of STS that is farthest away from IS will prevail. Development conceptualized as expanding human wellbeing can offer a common ground for the farthest reaching people within each community (i.e., of western science and technology, and the most conventional agents of IS). Rejecting the "technology fix" approach to social and environmental problems—innovation as a problem—may come together with analyzing yet "undone innovations" (to take up David

Hess's expression ([Hess 2007](#)))— that is, innovation as part of the solutions for pressing human needs, both in relation to the global South and North.

Question 2. How Should We View the Relationship Between STS Approaches to Innovation and Neighboring Fields, Especially Innovation Studies (IS)?

Why the Relationships Between STS Approaches to Innovation and Neighboring Fields are Important?

Building a union at the intersection of STS and IS community practices is relevant for bringing to the attention of each: the community factors that explain and influence processes of knowledge production and use, particularly those that may remain 'below the radar' of their favored approach. For instance, accepting that the IS community is more policy-oriented than STS, insights from some strands of the latter might be helpful to incorporate meaningful context-based analyses in policy recommendations. Conversely, STS has a rich tradition of exploring experiences at the micro-level but rarely reflects on the possibilities of scaling them up, being the latter central to any transformative endeavor. Some orientations of IS can analyze the barriers for scaling-up and assess strategies to overcome them.

I am not sure that generalizing from "whole" STS and "whole" IS provides a meaningful way of addressing this second question because hubris is present in both communities. Moreover, those engaged in a war on concepts may not be interested in coming together at all. Perhaps a better way of seeing the relationships between STS and its neighboring fields is through the lens of significant innovation problems. For instance, what available means are there for an innovation to be considered satisfactory and by whom? Concomitantly, how can innovations be designed to become useful for or give satisfaction to someone or something? For those interested in these questions in the IS field, user-producer interactions are important aspects because of what may give rise when such interactions are established between producers of solutions that have technological knowledge that is imposed upon users. For instance, users may not have enough expertise to discuss how an innovation is unsatisfactory—and appear "weak" actors—in the sense of communicating feedback (Lundvall 1985). For those in the STS field, co-production practices come to the fore ([Jasanoff 2004](#)). Both approaches are different but related—and incorporating insights from one to the other may be considerably enriching for both.

The Need to Recognize Diversity in "Styles" of Innovation

Another innovation problem analyzed by parts of both communities relates to the "styles" of STI. Powerful cultural and ideological imaginaries posit the superiority of innovations made in conditions of material abundance, characteristic of highly industrialized nations; a situation that often leads to a narrow and unilateral conceptualization of innovation. Nowadays, the directionality of innovations is under scrutiny, and the need for transformative changes to fulfill social needs differently is recognized. For instance, will the design of a "new style" of innovation, able to overcome criticisms, continue to be based on material abundance, or will the need to innovate shift to a widely different approach derived from scarcity conditions ([Srinivas and Sutz 2008](#))? What would that shift imply? What have both communities to say in terms of the knowledge, interests, and power relations at play?

I would suggest that STS approaches to innovation should make room to work together with neighboring fields around the "innovation that could and should be" besides denouncing the "innovation that is." This foresight would open a common ground to explore potentially fruitful relationships with and not necessarily limited to IS as a field.

Question 3. What New Conceptual and Empirical Resources Can STS Bring to the Study of Innovation (Including the Possible Redefinition and Reframing of the Term Itself)?

Innovation's multiple meanings are polyvalent, covering different scales and scopes, and therefore irreducibly ambiguous. Success and failure are intimately related to the concept of innovation, but they are relational and not fixed characteristics. Innovation success, failure, usefulness, harmfulness are qualifications without meaning unless asking: for whom such qualifications apply? Redefining or reframing the term is not then the best way to better grasp "all" of the social involved in innovation as if that were possible. Having said all that, STS has built "focusing devices" which are of particular importance for the study of innovation. Often innovation is taken as a given, as a sort of Athena jumping out from Zeus's forehead. If innovation is conceptualized as a given, as a sort of inevitable outcome of the latest state of knowledge, this can at worst paralyzing, i.e. there is nothing we can do, or at best, misleading for not looking into totally different directions for solving problems. Understanding and transforming actions require a thorough analysis of innovation as the outcome of interests, conflicts, power relations, and the deployment of methodologies for identifying their protagonists. STS can be of great help in this regard.

As a scholar from the South, I find that STS and IS have not delved enough on the conditions in which innovation emerges in underdeveloped regions. Consider for a moment a vast scope—stemming from the peripheral economic conditions and the subordination of Southern research agendas to a Northern orientation—and remember that we know little about the heuristics that guide innovation in places where structural characteristics widely differ from those prevailing in highly industrialized societies. Frugal innovation implies doing the same thing or differently by using dramatically fewer material resources (Bound and Thornton 2012). Frugal innovation is arguably more necessary in facing the known and unknowable challenges and consequences of climate change. It is also necessary to produce goods and services of high quality and make them accessible to the vast majority of the world's population—without which inequality would prevail—yet in such a way that the increase in production would not lead to an environmental catastrophe but would instead factor in the balances to be made when there is a potential abundance of resource scarcity. Such learning implies a momentous shift in STS and IS conceptualizations around innovation. I see this as a common challenge ahead, where several insights from STS and IS can make substantive contributions.

Final comments

I want to finish by providing two examples of the interplay between IS and STS. The first implies two outstanding scholars in each field—Christopher Freeman and John Desmond Bernal, respectively. Freeman said that when he got to know Bernal's approach to science and society, it was like an open window through which fresh air entered into the somewhat suffocating ambiance of economic studies (Freeman 1992). Bernal

strongly influenced several innovation scholars working from an STI political economy perspective (ibid.). In Latin America, conceptualizations coming from Jorge Sabato's analysis on innovation in the development process influenced some orientations of STS studies (see: Sabato and Botana 1968; Arocena and Sutz 2020). Not necessarily all scholars in both fields will feel the need to learn from each other, but if some between them do, our understanding of innovation will surely improve.

Author Biography
Judith Sutz has been for thirty years the Academic Coordinator of the University Research Council, Universidad de la República, Uruguay.

References

Arocena, Rodrigo, and Judith Sutz. 2020. "The Need for New Theoretical Conceptualizations on National Systems of Innovation, Based on the Experience of Latin America." *Economics of Innovation and New Technology* 29(7): 814–829.
https://doi.org/10.1080/10438599.2020.1719640.

Bound, Kirsten, and Ian Thornton. 2012. *Our Frugal Future: Lessons from India's Innovation System.* Nesta Report. Accessed November 9, 2021.
https://media.nesta.org.uk/documents/our_frugal_future.pdf.

Freeman, Christopher. 1992. "Bernal and the Social Function of Science." In *The Economics of Hope. Essays on Technical Change, Economic Growth and the Environment,* edited by Christopher Freeman. London: Pinter Publishers. 3–30.

Hess, David. 2007. *Alternative Pathways in Science and Industry. Activism, Innovation, and the Environment in an Era of Globalization.* Cambridge, MA: The MIT Press.

Irwin, Alan. 2023. "STS and Innovation: Borderlands, Regenerations and Critical Engagements." *Engaging Science, Technology, and Society* 9(2): 41–56.
https://doi.org/10.17351/ests2023.1363.

Jasanoff, Sheila, ed. 2004. *States of Knowledge: The Co-Production of Science and Social Order.* New York, NY: Routledge.

Lundvall, Bengt Åke. 1985. "Product Innovation and User-Producer Interaction." *Industrial Development Research Series* 31, Aalborg: Aalborg University Press.

Sabato, Jorge, and Natalio Botana. 1968. "La ciencia y la tecnología en el desarrollo futuro de América Latina" [Science and technology in the future development of Latin America]. *Revista de la Integración* 3(1): 15–36.

Srinivas, Smita, and Judith Sutz. 2008. "Developing Countries and Innovation. Searching for a New Analytical Approach." *Technology in Society* 30(2): 129–140.