Book Review: ALessandro Mongili and Giuseppina Pellegrino (2014), Information Infrastructure(s): Boundaries, Ecologies, Multiplicity

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08 January 2025

Scaling Up Boundary Objects

Review of Mongili, Alessandro and Pellegrino, Giuseppina (Eds.). 2014. *Information Infrastructure(s): Boundaries, Ecologies, Multiplicity*. **Newcastle upon Tyne: Cambridge Scholars Publishing.**

by Annalisa Pelizza, University of Twente, The Netherlands

Information Infrastructure(s): Boundaries, Ecologies, Multiplicity appears as a book out of standard since the very first moment you pick it up. The elegant hardcopy format chosen by Cambridge Scholars Publishing is considerably squarer than usual books. The impression of escaping standardization then continues as you browse through the table of contents, where the most renewed (mainly Anglo-Saxon) names in the field of Science and Technology Studies (STS) and information technologies do not occur. Indeed, besides the foreword by Geoffrey Bowker, this book constitutes a genuine continental European take on STS and information infrastructures, with authors' perspectives and case studies ranging from Italy to France, from Germany to Belgium, from Austria to Romania.

This note should not be misleading, though. On one hand, the whole book consistently and pervasively engages with English literature, especially the British and North-American one. On the other hand, while so doing, it has the merit of implicitly historicizing it. By problematizing STS notions that were initiated and established in English, it indeed returns depth to their original formulations, and collocates them in the current debates about mobilities, vulnerability, preventative medicine (just to name a few topics addressed by the contributions).

This is especially true of the Introduction, in which the editors carefully recall the STS literature on information infrastructure and computer supported collaborative work since the 1990s. Theirs is not so much a philological exercise *per sé*, though, but rather an endeavour finalized to set the ground to analyse heterogeneous fields involving informational dimensions through an ecological perspective. Drawing upon the STS-established notion of "boundary object" (Star and Griesemer 1989; Trompette and Vinck 2009; Star 2010), Mongili and Pellegrino introduce the conceptualization of "infrastructure-as-boundary" as a way to claim for a sociological analysis of infrastructures as boundaries, and not simply as coordinating tools. They ask in particular to what extent two key insights formulated by Susan Leigh Star about boundary objects – namely, the relationship between the well-structured and ill-structured, and the production of residual categories – can be scaled to the infrastructural level.

If this is the conceptual framework around which individual contributions revolve (see also Star and Ruhleder 1996), it is nevertheless challenging to make justice of the multiplicity of cases discussed in the fourteen chapters that constitute this book. Chapters' distribution is indeed another

regard in which the book escapes easy standardizations. Contributions focused on what might be most obvious STS topics (e.g., design, users, health care, software studies) are instead scattered along the four main sections. As the editors point out, chapter subdivision follows subtler *principia divisionis*, which however are not fully clarified.

In extreme synthesis, the book unfolds along three major directions. Firstly, most of its contributions aim to extend the range of artifacts, technologies and practices that can be conceived of as boundary objects. Pellegrino, for example, further develops the relationship between infrastructures and boundary objects as it emerges through three heterogeneous cases (a naval disaster, a sensor information classifier, and haematological cancer) that unveil the relationship between contingency and vulnerability. She argues that boundary objects can govern or even contrast contingency's ability to emphasize vulnerability of groups or infrastructures, when they provide adequate tools for categorical work.

A specific example of boundary object governing contingencies is provided by Turrini's analysis of risks thresholds in preventative medicine. By focusing on the processes through which the "advanced maternal age" (AMA) cut-off has been developed, practiced and questioned, he discloses the performative nature of risk thresholds as boundary objects. Similarly, Klein and Schellhammer describe the introduction of industrial drugs automatic dose dispensing (ADD) in Germany as a disruptive infrastructural innovation. In their analysis ADD is being constituted as a terrain of negotiation between established and emergent assumptions about the roles of health care actors. However, differently from Pellegrino's suggestion, here the ways ADD was framed by diverse coalitions failed to provide categorical tools to govern infrastructural vulnerability.

Another case of (failed) boundary objects as source of instability that jeopardize collaboration among actors is provided by Francesco Miele, who analyses a spin-off organization providing consultancy and software on hydrogeological risk. Neresini and Viteritti contribute to the endeavour of extending the variety of boundary objects by adopting a micro perspective on biotech laboratory components. Kits of ready-made substances, devices and procedures are described as "pieces of research activities standard enough to be boxed up, mass-produced and used by many". While they share with infrastructures some traits such as opacity, standardization and interoperability, being disposable laboratory kits cannot be fully identified with infrastructures, but rather with boundary objects.

Secondly, as previously mentioned, a notable trend in the book is the re-contextualization – and therefore re-semantization – of concepts originally introduced by STS authors in the late 1990s. For example, "convergence" – the double process through which information artifacts and social worlds come together (Bowker and Star 1999; Star, Bowker, and Neumann 2003) – is exemplified in the analysis of a client development by Mongili as the alignment and recombination of software and

protocols, demos and slides, desktop practices and originators acting as users into new socio-technical assemblages. Isabella describes efforts to configure users of a mobile application as the result of convergent managerial practices and divergent uses performed by technicians. Similarly, Lugano proposes a theoretical model based on convergence vs. divergence as a conceptual tool to analyse and improve the design of mobile devices. He argues that up to now "amplification" (i.e., convergence) of social network signals in digital communities design has received far more attention than "attenuation" (i.e., divergence). That is, combining, connecting and aggregating information have been the focus of mobile social software, much more than features for clustering and filtering information. Lastly, Michela Cozza recovers the notion of "convergence" as more adequate than "interoperability" in order to describe the mutual constitution of information artifacts and social worlds in Italian Science Parks.

Thirdly, the book at times tries to force the boundaries of the ecological take on information infrastructures, and to dialogue with other (STS and non-STS) traditions. Thus, Poderi recovers Mol's notion of multiplicity (Mol 2002) in order to describe the relationship between design knowledge and Free and Open Source Software (FOSS) development infrastructure. Stefano Crabu proposes an interesting extension of the ecological paradigm by focusing on the ecologies of actions that come to establish protocols in molecular biology laboratories as "infra-structuring objects". Inasmuch as they are "used by scientists of the same professional community to define a space of technical work", protocols as infra-structuring objects differ from boundary objects that allow cooperation among actors from diverse social worlds. Further addressing this latter concept, Denis and Pontille pay attention of an aspect that is underrepresented in the rest of the book, namely the elusiveness of (cycling) databases and infrastructures, that do not tend towards creating epistemic communities nor social worlds, as it is instead postulated in the literature on boundary objects.

Finally, Lazzer and Giardullo propose a framework that integrates the ecological STS paradigm with practice theory (Schatzki, Knorr-Cetina, and von Savigny 2001) in order to interpret the reading and writing practices associated with the emergence of the e-book. A similar effort to put STS infrastructural studies in dialogue with adjacent scholarships is pursed by Mitrea, who proposes a model of intelligent mobility as a dispositive by engaging with a rich post-modern literature.

All in all, *Information Infrastructure(s)* constitutes a dense and stimulating reading for scholars interested in extending the ecological infrastructure paradigm to emerging fields of research that involve informational dynamics, besides digital media. It also provides a consistent compendium of STS infrastructure studies that graduate students might find thought-provoking, although sometimes repetitive (for example, almost each contributor feels obliged to start his/her chapter with a definition of infrastructure).

Besides this stylistic drawback, one major weakness should be mentioned. Paradoxically (i.e., given its effort to criticize actor-network formulations like "immutable mobile" and "obligatory passage point" in the light of the ecological approach), *Information Infrastructure(s)* incurs in a flaw that has traditionally been imputed to actor-network theory (among many others, see Collins and Yearly 1992). While it furthers the ecological endeavour to highlight multiplicity, openness, instability and collaboration, the book seems to lose sight of how authority is constructed through processes of knowledge making, of where power is nested, and along which trajectories it is distributed in these infrastructural entanglements. While assuming distributed and collective generativity not only as epistemological necessity, but as an ontological horizon, this collective endeavour seems to downplay the original STS understanding of information infrastructures as exclusion-generating and power-distributing devices.

This said, the books positions itself as an original attempt to open the field of STS-informed infrastructure studies to emerging disciplines and concerns. As such, it is worth reading not only by an STS-savvy readership, but also by scholars interested in the informational dynamics taking place in biotechnology, medicine and health care, organizational studies, innovation policy, design, user and mobility studies.

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