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Alessandro Mongili and Giuseppina Pellegrino (Eds.), "Information Infrastructure(s). Boundaries, Ecologies, Multiplicity." Newcastle upon Tyne: Cambridge Scholars Publishing, 2014, 380 pp.

(doi: 10.2383/85818)

Sociologica (ISSN 1971-8853)

Fascicolo 3, settembre-dicembre 2016

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Book Review

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The importance of technologies in shaping and hindering social relationships has become a recurring trope of analysis of contemporary societies and it has largely been investigated by social sciences. As work and personal life spaces become technologically-dense environments populated with digital tools and devices [Bruni and Parolin 2014], social coordination is increasingly ensured and shaped by technological artefacts that enable to record, manage, retrieve and share information allowing for collaboration and distributed activities that stretch over time and space. Social sciences have often adopted a perspective that considers technologies exogenous and taken-for-granted elements focusing on the assessment of their "impact" on different social worlds. This approach overlooks the processual dimension of the negotiations, conflicts and contingencies that affect the design, development and implementation of technical artefacts.

These neglected traits are at the core of the reflection of *Science and Technology Studies* (STS), which offer a repertoire of concepts to analyze the creation and use of tools, the co-construction processes of social practices and technical artefacts, and the boundary interactions between systems.

Drawing on this tradition, the collection of essays edited by Alessandro Mongili and Giuseppina Pellegrino offers an overview of the recent debate on technologically-mediated coordination. The book focuses on *Information Infrastructures* and *Boundary Objects*, considered as both theoretical lenses and empirical objects to unpack the issues of coordination, distributed activities and conflict between heterogeneous actors. Information infrastructures and boundary objects have had a long fortune in STS, but they are also referred to in various disciplines of social sciences, information sciences, management and engineering. The editors' introduction provides the readers with a genealogy of the two concepts, offering an overview to those who are not familiar with them as well as a rich bibliographical apparatus to the scholars already familiar with the STS vocabulary.

Whereas, from a mere technical viewpoint, an Information Infrastructure is a list of numbers, technical specifications and hidden mechanisms with a relational character towards organized practices [Star and Ruhleder 1996, 113], for social scientists information infrastructures are important as they "carry information out in different spaces, but also in different times, creating an important texture not only for a basic exchange of information or data, but also for work, mobility, leisure, and many activities of everyday life" [Mongili and Pellegrino 2014, Introduction, XV]. The texture-creating feature of information infrastructure is thus what makes them relevant to understand phenomena such as modern social movements [Youmans 2012] or architecture [Henfridsson and Bygstad 2013].

Boundary Object is a concept introduced by Star and Griesemer to describe artefacts, objects, or concepts that embody different meanings when they are used to me-

mediate action across different social worlds [Star and Griesemer 1989; Star 2010], while “different groups work together without reaching any consensus about the use or the meaning of a device that connects them” [Mongili and Pellegrino 2014, Introduction, XXII]. The notion of boundary object challenges the idea that collaboration requires a shared understanding of the situation at hand and it shows how common distributed action might instead benefit from ambiguity that allows to preserve diversity while fostering collaboration. The notion of boundary object has influenced, among others, the sociology of design and innovation [Bruun and Sierla 2008], work situation analysis and design [Evans 2009], political science [Cochoy 2009].

The essays in the book add a further and original contribution to this debate, exploring the socio-technical construction of the pattern that allows the taken-for-grantedness of information exchange at the base of many daily activities along three main lines of inquiry: information infrastructures, infrastructures as boundary concepts, and protocols as infrastructuring objects. In each of these lines of enquiry we find essays that do not simply use the concepts as a theoretical lens but engage with the concepts and stretch them. We will consider a selection of the essays to illustrate these points.

Some essays regarding information infrastructures challenge the usual idea of what infrastructures are. A nice example is provided by the essay by Giacomo Poderi [Pp. 78-98], a virtual ethnography aimed at analyzing the implementation of video games that are designed cooperatively online through a Free and Open Source (FOSS) program. Focusing on the production and exchange of knowledge with the participation of users and developers, the essay shows how, as the game develops, the boundaries between the infrastructure and the product blur: “The video game itself becomes infrastructure where designing is concerned [and] the traditional distinction, in functionalist terms, between ‘production’ and ‘communication’ tools becomes lurching, because a communication medium, such as an Internet Forum, becomes the locus for the actual co-construction and definition of design rationales” [p. 95].

In a similar fashion, the study presented by Jerome Denis and David Pontille [Pp. 146-167] regarding digital cartography and free map databases shows how the coordination activities of heterogeneous actors contribute to redefine the very same infrastructure.

Other authors challenge the usual notion of boundary objects. The two essays by Mauro Turrini [Pp. 258-283] e Francesco Miele [Pp. 238-257] offer a striking example of analytical richness of the concept. As said above, boundary objects mediate or hinder collaboration between different social worlds while keeping different meanings for the different actors. In the case proposed by Turrini, risk thresholds in advanced maternal care are considered non-material objects able to move through heterogeneous sets of practices, disciplines and actors. These numerical entities are mobilized in different set of practices and contribute to redefine the relationship between the actors involved. Apparently stable and precise, “these boundary numbers instead constitute the terrain of negotiation around which new medical practices, sets of civic rights and duties, conceptions of health, and other phenomena like motherhood are configured and reconfigured” [p. 276]. Francesco Miele takes a different perspective framing whole organizations, university spin-offs, as boundary objects. In his analysis, Miele shows how organizations that are constructed as ad hoc tools to achieve collective goals, can become obstacles to organizing, by blocking the connections between the various actions and the achieve-

ment of common objectives – with the paradoxical effect that an organization designed to provide stability to a pre-existing network can unexpectedly become an obstacle to its reproduction.

A third concept deals with the protocols as infrastructuring objects that carry artefacts, information and standards from one context to another. Stefano Crabu [Pp. 121-144] observes a team of biologists, especially the novice researchers, dealing with the construction and use of protocols in a molecular oncology institute. The case study offers the opportunity to see how protocols pre-exist the local social practices (incorporating procedures, classifications, standards, technical convergences) but are also shaped in the interaction of “practitioners [that] attempt to contextualise these elements by ‘flirting’ with the protocol” [p. 135], developing organisational routines and innovating experimental practices. Only once naturalized, the protocols become part of taken for granted scientific practices. The ability to use the protocols allows novices to become part of a professional community. Protocols are at the core of the analysis of the device implementation process, user management, and resolution of technical problems also in a call center of an Italian telecommunications company: Simona Isabella [Pp. 218-236] analyzes the case showing how the organizational, technical and managerial demands could determine standards and classifications that support the information infrastructure used by the technicians in their work.

As a whole, the volume presents a pictures of the current debate on information infrastructures. The choice to focus on empirically-grounded analyses and the variety of cases handled offer the readers the chance to see the analytical categories “in action”. The text requires readers a constant change of focus, moving from the analysis of social processes involving a few actors placed in confined spaces, to those affecting large communities that move on a planetary scale. The reading of the book as a whole, however, demonstrates the close connection of the different planes and the fecundity of an ecological approach to the analysis.

A final note. We would draw the readers’ attention to the very first pages of the introduction where the editors use three pages to present the genesis of the book. They describe the editorial process, its intertwinement with the history of the STS Italia association founded in 2006 and the intellectual debt with some of the most prominent figures of this debate, and namely Susan Leigh Star, to whose memory the collection is dedicated, and Geoffrey Bowker, author of the foreword to the book. These pages offer an unusual glimpse into the processes that led a small group of Italian scholars to create a solid network with the fast-growing community of Italian STS scholars as well as with the international community.

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