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10   Studying Discourse in Internet Governance through Mailing-List Analysis

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Many aspects of contemporary global data flows, including users' ability to enjoy civil liberties online, are shaped by Internet governance processes (DeNardis 2014). Influencing these processes is thus of paramount interest to governments, the industry, and civil society. Engineers and entrepreneurs, lawyers and bureaucrats, and scientists and advocates engage in the development and negotiation of Internet policies and standards in a plethora of fora, each characterized by its own specific configurations of decision-making processes (Hofmann, Katzenbach, and Gollatz 2016). Such a multifaceted scenario results in a wealth of issues, actors, venues, and policy processes that are often intertwined in complex ways (Raboy and Padovani 2010). But it is not just a matter of mere technical details. Because the "arrangements of technical architecture are arrangements of power" (DeNardis 2014, 7), the design of the Internet (Braman 2011) and the associated policy making (Mueller 2002) can be understood as "politics by other means" (Abbate 1999, 179). This makes the study of technical aspects of the Internet and their making, which might otherwise seem solely a matter for engineers, of great interest for social scientists.

Whereas the design, functioning, and decisions of various Internet governance and standard-setting bodies and the participation of different groups have been the topic of several publications (see, among others, DeNardis 2009; Mueller 2010; and Musiani 2013), methodological aspects for the study of Internet governance have received limited attention (e.g., Musiani 2015; Raboy and Padovani 2010). To date, research has relied on discursive methods such as qualitative interviewing and document analysis (e.g., Hintz and Milan 2009; Musiani et al. 2016; Raboy, Landry, and Shtern 2010) or participant observation in policy processes and network analysis (e.g., Hintz 2010; Mueller 2010; Pavan 2012). More recently, however, new

software enables automatized analysis, allowing a more granular approach
in the study of discursive practices in Internet governance (e.g., Milan and
Ten Oever 2017). We argue that software-based tools and methodologies can
enhance our understanding of Internet governance and standard-setting
processes, in particular with respect to the study of discourse and discursive
practices—thus galvanizing this relatively young but swiftly growing field
of research.

   This chapter explores innovative approaches in the study of discourse
within Internet governance settings. Moving from the observation that
Internet governance is a "politically contested process of meaning making"
(McCharty 2011, 90), we ask what *other* sources of data are available and what
can they tell us. What methods are best suited to interrogate these data and
processes? While the study of discourse in general remains a crucial focus
of Internet governance, we argue that *group discussions* in particular are the
natural sites to explore if we are to study the *evolution* of said discourses. In
particular, mailing-list archives are a precious and surprisingly underexplored
source of data about discursive and norm change as well as stakeholder con-
flicts and alliances. We contend that only a mixed-methods approach com-
bining computational and interpretative tasks is able to exploit these data
sources at their best. In addition, we reflect on the potential of this approach
to elicit strategic and tactical interest groups and belonging of social actors,
as well as the ethical challenges of this methodological approach. This article
tackles some existing challenges to Internet governance scholarship, among
those highlighted by DeNardis in chapter 1. In particular, we believe that
mailing-list analysis has the potential to contribute to making the invisible
visible, by shedding light on otherwise *backstage* decision-making processes
and highlighting the inherent power relations. Relatedly, it helps researchers
navigating conflicting values, by empowering them to map power coalitions,
surface decisional conflicts, and identify marginalized voices.

   The chapter is organized as follows. First, we briefly review existing dis-
ciplinary and methodological approaches in the study of Internet gover-
nance. Second, we define what we mean by "discourse" in the context of
the study of Internet governance, largely building on sociological accounts.
Third, we explain why mailing lists are a valuable data source, presenting
a viable approach to their investigation. We conclude by reflecting on two
points: the ethical challenges of the study of mailing lists and the affor-
dances of this approach to support "engaged research" (Milan 2010, 856)

decision-making concerning the present and future of crucial infrastructures of our times.

Main Approaches in the Study of Internet Governance

Internet governance increasingly resembles a "mosaic" (Dutton and Peltu 2007), in which relations and issues are knit together. This complex, polycentric ecosystem opens a window on issues of sociopolitical nature that present themselves as technical and of technical issues that turn out to be political (Scholte 2017b). The mosaic itself represents a sort of complex performance (Hofmann 2016) involving a variety of actors—namely, governmental and corporate players, the organized civil society, academia, and the so-called technical community made up of, among others, engineers and computer scientists. A large share of this performance takes place in open bodies, whose functioning and decision-making processes are well documented and publicly accessible. A significant amount of activity, however, still takes place outside public scrutiny (Epstein, Katzenbach, and Musiani 2016).

Developing at the intersection of many processes, Internet governance lends itself to study from a variety of disciplinary perspectives. Each of them brings to the fore specific layers of the mosaic, with implications for the phenomenon that is being observed. This section offers a brief overview of the many layers that can be fleshed out and the distinct disciplinary perspectives that can be adopted when approaching Internet governance as an object of study, bearing in mind that research on Internet governance often focuses on specific areas or issues, with the risk of "equating the overall complexity of the landscape with some of its aspects" (Pavan 2012, xix). Here we review the perspective of those studying the technical and logical layer of the Internet, of those looking at market dynamics subtending the development and operation of the Internet, and of those analyzing the involvement of governances. We conclude by reviewing the holistic approach of science and technology studies (STS).

To start with, Internet governance can be approached from the perspective of computer science in at least three ways. First, computer science plays a vital role in the development of technology supporting the functioning of the Internet, such as communication protocols and other methods of ordering data and data flows. Notable examples are the global database of registered domain holders, WHOIS (Request for Comment [RFC] 3912 [Daigle

2004]), and the registration data access protocol (RFC 7482 [Newton and Hollenbeck 2015]), the latter expected to replace WHOIS and currently being piloted by the Internet Corporation for Assigned Names and Numbers (ICANN).[1] Far from being just a "plumbing matter" (cf. Musiani 2015), these protocols embody distinctive implications of political nature that cannot be understood merely from an engineering perspective. WHOIS, for example, exposes personally identifiable information such as name and home address of the domain holder through a publicly accessible database. At the time of designing the database for what was still a tiny network compared with today's Internet, these implications were not taken into account. Yet the scope of these protocols is far reaching, as testified by the development of Internet protocol version 6 (IPv6) (DeNardis 2009). Second, computer science informs the decisions around the adoption and implementation of technology, because the Internet governance debate heavily relies on computational measures, especially when it comes to the (lack of) adoption of specific standards, protocols, or technologies such as IPv6 (Perset 2010) or the suite of Internet security protocols DNSSEC (Domain Name System Security extensions; Wang 2016). However, while computer science is essential for us to be anchored to the concrete materiality of an issue and its implications, it bears the inherent risk of naturalizing technology, hiding its political implications in the name of the just-because-it-works attitude typical of engineering. Third, and of particular interest here, computer science contributes to the study of Internet governance by developing multipurpose computational methods, ranging from Internet traffic measurements to methods such as those outlined in this chapter (Benthall 2015; Doty 2015; Niedermayer et al. 2016). In this respect, the discipline largely relies on theoretical and experimental methods—whether the development of new hardware, software, communication protocols, algorithms, and databases or the measurement of their effectiveness.

Markets are a key driving force behind the Internet and its governance, thus we ought to consider also economic factors if we are to fully understand its governance arrangements. Since its inception, corporations have played a central role in the development of the Internet—for example, serving as subcontractors for research institutions and the US Department of Defense, which is behind the birth of the Internet as we know it (Frischmann 2001). Their importance radically increased after the privatization of the Internet backbone and the decommissioning in 1995 of the National Science

Foundation Network, a series of US-wide backbone computer networks of the early days (Chinoy and Salo 1997; Kahin 1990). This trend accelerated in the 1990s when the web made the Internet accessible for less-terminal-savvy users. Nowadays, significant levels of market concentration can be observed in all layers of the Internet infrastructure (Dolata and Schrape 2018). Research into market dynamics has thus accompanied the Internet in all these stages, partially because economic policies have played a large role in shaping it (Kahn 1994), and partially because the Internet has a significant impact on the economy (Guillén and Suárez 2005). In Internet governance, considerations of economic nature come into play in the study of scarce resources such as IPv4 addresses (Edelman and Schwarz 2015; Mueller and Kuerbis 2013), the costs of Internet access (Chaudhuri, Flamm, and Horrigan 2005; Prieger 2007), and net neutrality (Greenstein, Peitz, and Valletti 2016; Hahn, Litan, and Singer 2007; Jay and Byung-Cheol 2010). However, these macroeconomic approaches tend to discount the materiality of Internet infrastructure as well its political implications. Moreover, Internet governance is awash with examples of how relevant decisions may happen outside market mechanisms and how control over markets is sometimes pursued via noneconomic means.

Since the early days, when the US government bankrolled the development (Kahn 1994) and supported the global vocation of the Internet, governments have played a significant role in the expansion of the infrastructure. If intergovernmental bodies took a leading role in the coordination of earlier examples of cross-border communication networks such as the telegraph, with the Internet this role has been repeatedly questioned (Chadwick 2006; Drake 2000; Mueller 2010). Communication scholars and political scientists have explored the rise of new governance bodies and how they reconfigure the role of governments (Epstein, Katzenbach, and Musiani 2016), understood through the conceptual lenses of governance innovation (Epstein 2013), regime complex (Nye 2014), and complex hegemony (Scholte 2017a). Works have postulated that governmental regulation might lead to Internet fragmentation (Drake, Cerf, and Kleinwächter 2016; Mueller 2017). While political science, and governance studies and international relations scholars in particular, empowers observers to understand the interactions and the power dynamics involved in Internet governance, as well as the persistent role of governments in them, it embodies a number of limitations. To name just one, governance is a distributed accomplishment that happens not only within governance bodies (Van Eeten and Mueller 2013). Moreover,

we cannot understand it as a matter of interaction between only discrete entities—be they states, companies, or civil society actors. As we discuss later, we have to put into focus also the micro interaction layer of individual and small-group participation in decision-making.

Probably the latest addition to the Internet governance tool kit, the discipline of STS has emerged as a particularly fruitful approach. Adopting an STS perspective, scholars have investigated Internet standards as policy documents (Braman 2011), innovation in multistakeholder configurations (Hofmann 2016; Milan and Ten Oever 2016; Ten Oever 2018), the impact of the materiality of infrastructure on the ability of people to exercise their human rights (Cath and Floridi 2017), and infrastructure as a locus of political control (DeNardis and Musiani 2016). STS-inspired approaches allow scholars to weave together both the materially and socially constructed aspects of complex socio-technical processes like Internet governance. Especially through infrastructure ethnography (Bowker et al. 2009; Star 1999) and actor network theory (Latour 2005; Müller 2015), STS can capture the ordering of reality as brought to life by both human and nonhuman actors, as well as the mapping of concrete controversies (Epstein, Katzenbach, and Musiani 2016). However, the focus on the actors' point of view might distract from the bigger picture, obfuscating the role of deeper structures of power and strategic or even deceptive behavior.[2]

While the perspectives and contributions briefly outlined here might appear contiguous yet irremediably apart, we argue that they share a valuable interest for the discursive layer of Internet governance. They variably, and often indirectly, acknowledge that Internet governance is, as McCharty (2011) reminds us, a terrain of political contestation whose object is the construction of meaning associated with infrastructure and society at large. Following McCharty's injunction to take discourse seriously, we now look at what discourse means in Internet governance.

Discourse and Networks in Internet Governance

Discourse gives shape to and reflects the multiple visions and narratives of the Internet as they are developed and advanced by stakeholders. It is in discourse and intra- and intergroup discussion dynamics that meaning making, with its contradictory, chaotic nature instilled in human relations and histories, becomes visible (see Doolin 2003).

Discourse has been under the spotlight of scholars from disciplines as distinct as linguistics, semiotics, and cognitive psychology for as long as since the first half of the twentieth century, thus we will not attempt to provide a comprehensive history of discourse in the sciences. We instead focus on two potential approaches derived from sociology, which posit discourse as at the core of meaning making by and micro interaction between social actors (Melucci 1996) and as something deeply entrenched in the cultures and ideas shaping technological innovation (Flichy 2007).

Combining these perspectives, discourse can thus be seen as the main vehicle for competing values, ideas, and interests to come into focus and play out in multilayered settings by opposed, distinct stakeholders through the contestation over different policy options and technical orderings. It embodies the micro interaction and the narrative dimensions—in which the former includes organizing, mobilization, collaboration, and conflict dynamics, while the latter ranges from beliefs and policy priorities to the "cultural and symbolic understandings surrounding the Internet" (McCharty 2011, 90). Discourse is thus both a vehicle for fostering norm and policy change in Internet policy making and a source of legitimation for the social actors engaged in the process.

As a set of "practices that systematically form the objects of which they speak" (Foucault 1972, 49), discourse can be seen as a locus of power—but contrary to Foucault, the constitution of social relations we are interested in unfolds at the micro level of interaction rather than the macro level of the (historical) social order. As such, discourse is strategically and purposely mobilized by distinct actors (see McCharty 2011). We contend that this perspective can help us capture the multiple levels of contestation that surround Internet policy making and the way ideas and values diachronically evolve, often in surprising ways and unintended directions, through stakeholder interaction. But how can we map the competing narratives that animate, shape, and shake Internet governance arenas? In the next section, we delve into the locus par excellence where discourse unfolds in Internet governance: mailing lists. Studying interaction in mailing lists, we argue, empowers us to investigate qualitatively and quantitatively the discursive formation of policy preferences.

Mailing-List Analysis with BigBang

A distinctive feature of Internet governance bodies such as ICANN and the Internet Engineering Task Force (IETF) is their (relative) openness and the degree of meticulous documentation of their activities through public archives. In most cases, this is not limited to working documents and official outputs but extends to conference calls, public meetings, and cross-community discussions. Everything is recorded and made available on organizational websites for reasons of internal accountability and institutional memory. These archives offer researchers a unique opportunity to investigate the premises of otherwise behind-the-scenes decisions with broad societal implications, thus adding a layer of what we may call external accountability. Besides conference proceedings and documentation, a relevant and convenient repository for this purpose is email archives.

Mailing lists constitute a surprisingly underexplored source of data, holding precious insights on process but also on feelings, values, relationships, and backstage dynamics. The majority of mailing lists are publicly archived, with their archives being publicly accessible to nonmembers of the respective mailing lists. While mailing lists appear to have lost momentum, as today discussion between groups of friends and peers mostly unfolds on messaging apps or social media platforms, they remain a widely used medium in the realm of standards development and other sectors of the Internet governance community. They are extensively used for informal exchange, especially for informal coordination between social actors, and all the way to decision-making, thus making the pathway to decision-making visible. In other words, mailing lists are the locus where the multiple layers that constitute Internet governance sediment and where discourse and discursive practices are enacted in group discussions and collaboration.

Mailing lists offer insights on consensus building and decision-making, conflict and conflict resolution, evolution of a certain issue area and of the language associated with it, group dynamics, power concentration and inclusion or exclusion mechanisms, negotiation tactics, and more. At least four factors make mailing lists a versatile data source with great potential for the study of interactions within the realm of Internet governance:

- Mailing lists are structured. An obvious characteristic of emails is their standardized structure: headers make metadata easily parsable (e.g., by sender, type of interaction, time stamp), which supports different kinds

of classification and analysis. Moreover, format standardization facilitates analysis across different mailing lists and the reproducibility of quantitative analysis.

- Mailing lists are cross-sectional. A variety of stakeholder communities engage in discussion—and this all converges and sediments on one or more dedicated mailing lists. Researchers can thus study interaction (e.g., collaboration, contention, and conflict) between interrelated groups and online communities.

- Mailing lists are relational. Data extracted from email archives provide information on the evolving relations among actors (e.g., users' reply chains) or groups (e.g., mailing lists' interlocks), allowing researchers to analyze the structural basis of discourse, power relations among actors, and intergroup dynamics (through, e.g., network analysis).

- Mailing lists are multidimensional. They support social science methods, allowing researchers to circumvent the classical trade-off between scope and depth of the analysis. For instance, simple descriptive statistics (e.g., trends and rankings) can be enriched with relational data (e.g., interaction patterns and user-base overlap), and qualitative textual analysis can be complemented with advanced computational techniques (e.g., machine learning and big data analysis).

- Mailing lists allow longitudinal analysis. They have been the main means for discussing Internet infrastructure and architecture since its inception (see RFC 1155 [Rose and McCoghrie 1990], RFC 1211 [Westine and Postel 1991]). Because the history of mailing lists overlaps with the whole history of the Internet, lists enable a historical approach to Internet-related issues.

BigBang is a Python-based, open source, free software tool kit used by researchers as well as stakeholders in computational and interpretive analysis of mailing lists. At the time of writing, it supports analyzing mailing lists from Sourceforge, Mailman, and .mbox files, among the most common software applications for mailing-list management.[3] Compared with proprietary tools (such as those featured in chapters 2 and 9), open source tools improve verifiability and reproducibility of outcomes and allow more flexibility when adapting the software to specific research challenges.

With BigBang, mailing lists can be analyzed through three main lenses: descriptive statistics, network analysis, and qualitative and quantitative text analysis. Descriptive statistics give us a bird's-eye view about activities in a

given mailing list or sets of lists. We can track how many mails have been sent, in what time span, and by how many users. It also allows us to understand the distribution of the length of conversations, commonly known as threads, and the time span in which people were involved in them.

Network analysis of mailing lists reveals patterns of communications, their development, and the role senders have in the community. It helps in understanding whether certain participants function as a node for the dissemination of ideas across mailing lists and communities or whether conversations stop when certain actors (or groups of actors) get involved. It also shows the centrality of actors and their proximity to other nodes and whether early exchanges could, for instance, be indicators of emerging relations by reflecting an increase in shared messages over time. Finally, it reveals the distribution of individuals and groups (and subgroups) within the larger landscape and the connections between them: who talks to whom and who are the connectors across distinct stakeholder groups.

With qualitative and quantitative text analysis, we can combine the descriptive statistics and network analysis and ask questions with the two, moving past a basic question like what are the trending topics in conversations. It also allows us to analyze the affiliation of participants (Niedermayer et al. 2016), which in turn aids investigation of the role of formal and informal leaders in online communities. The combination of affiliation and formal and informal leadership roles helps in analyzing the responses of structured groups to specific topics and patterns. Because mailing lists allow text analysis one can couple the study of mailing lists with the analysis of other structured text, such as contributions to the code repository GitHub, policy documents, membership or participation registries, statements of interest, and meeting transcripts. This then can be used to investigate how affiliation, gender, RFC authorship, or other characteristics relate to levels of participation, the mode of participation, patterns in responses, etcetera. Finally, the computational analysis of mailing lists can offer pointers for more interpretative approaches such as Foucauldian, or critical, discourse analysis.

Like other approaches, quantitative mailing-list analysis in general, and BigBang more specifically, comes with some caveats. First, data sources typically contain biases, are incomplete, or are even systematically flawed (Karpf 2012), and mailing lists are no exception. Regarding data accuracy, we cannot but note that some dynamics, such as the presence of passive members, are not made visible by interaction in mailing lists, which archive only mails

that were sent to the list. Furthermore, only those mailing lists whose existence is known to the researcher can be analyzed—and only if the researcher has access to the archives. Some mailing lists do not hold archives; others are not public at all or do not allow public subscription. Not all data are correctly captured: in our analysis of bulk data from ICANN and IETF mailing lists, for example, we have come across emails erroneously dated as far back as 1904, and with otherwise obviously wrong timestamps (e.g., "32 Jan 2008")—and these were the ones we were able to identify and filter out. Occasionally, mailing-list archives contain spam, which might alter the results—but BigBang offers options for filtering spam out of the archives.

Conclusion

In this chapter we explore the added value of mailing-list analysis as a venue for investigating micro interaction and narratives in Internet governance and illustrate the potential of the BigBang tool kit. However, while the computerized analysis of interaction in mailing lists represents a fruitful venue to study discourse and discursive practices at the micro interaction level, there are some ethical considerations researchers need to attend to in particular with respect to privacy, anonymity, and consent. Although the mailing lists we used for our research are publicly archived, analyzing discourse and discursive practices may, for example, offer additional keys to understanding aspects of in-group interaction that might jeopardize group activities or dangerously single out certain users. Anonymizing utterances in publicly archived lists is impossible, as a search of public archives by third parties would easily reveal the author and other important metadata. Consent, then, is hard to obtain from every single participant but might be easier to obtain from an organization. Consent might come through the terms and conditions that come with mailing-list subscriptions or the expectations one might have when participating in a governance forum through its official channels, as happened in our research on ICANN and IETF lists. At least two questions arise: Is this a sufficient safeguard? What about "group privacy" (Taylor, Floridi, and Van der Sloot 2017)? In sum, with mailing-list analysis there is no one-size-fits-all ethical approach, and researchers can expect to have to make ad hoc considerations with respect to the participants' reasonable expectations in public mailing lists in a given sociopolitical context.

We conclude by exploring the claim that the study of (Internet) governance influences governance dynamics and outcomes. As Ziewitz and Pentzold put it,

> Given the role of governance research in rationalising, justifying and legitimating political interventions, methods cannot be viewed as neutral instruments. Interestingly, however, questions of methodology are only rarely discussed in studies of Internet governance. Most studies still tend to rely on case studies that are largely presented as unproblematic representations of reality, which are not further questioned in the course of the analysis. The absence of such methodological reflection makes sense in that it contributes to the performativity of governance by not inducing the reader to question the text and its authority. (2014, 318)

We believe mailing-list analysis with BigBang can be repurposed as a tool for engaged research; that is to say, an approach to inquiry that, without departing from systematic, evidence-based social science research, may support the attempts of advocates to set the agenda of policy makers (Milan 2010, 856). It can, for example, improve the accountability of actors and stakeholder groups engaged in Internet governance and uncover allies and alignments on specific policy options and technical orderings, perhaps advancing social concerns in the Internet governance landscape.

Acknowledgments

Notes

1. Requests for Comment (RFC) are the output documents of the Internet Engineering Task Force, the Internet Architecture Board, and the Internet Research Task Force pertaining to Internet infrastructure topics (see also Ten Oever and Moriarty 2018).

2. For a more comprehensive discussion of the role of STS, see chapter 3, in which Musiani thoroughly analyzes the contribution of STS to the study of Internet governance.

3. See the BigBang website at https://github.com/datactive/bigbang.

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