Title: The Technology We Choose to Create: Human Rights Advocacy in the Internet Engineering Task Force

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Abstract

This article is an ethnographic analysis of recent efforts with the Internet Engineering Task Force (IETF) to consider human rights in the development of Internet networking standards and protocols. By deploying qualitative methods—65 semi-structured interviews and two years of ethnography—I provide a detailed anthropological picture of how IETF participants understand technology, and what consequences their perspectives have for human rights advocacy. Internet governance scholars have recently debated the "turn to the infrastructure" and the role of human rights advocacy in the IETF. Bringing these theories together, I argue that the IETF's shared view about the non-prescriptive nature of technology encourages participants to resist the inclusion of human rights values through standardization. A protocol non-prescriptive view on technology and human rights becomes apparent in how IETF participants talk about standardization. I identify this non-prescriptive view of technology as a barrier to addressing human rights through standardization. This view explains why standards rarely reflect human rights concerns as a contextually embedded and social issue more than a technological or communicative problem. My findings inform ongoing academic and policy debates about the role of human rights advocates in the IETF and provide an epistemic grounding for the recent "turn to the infrastructure" in Internet governance research. I also apply these findings to argue that Internet governance research is entering a new phase—a reflexive phase concerned with how culture replicates power dynamics. This phase deepens a much-needed debate about how knowledge claims are made about what constitutes Internet governance, and I show the distinct role anthropological inquiry can play in defining who can make those claims.

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Acronyms

DDoS: Distributed Denial of Services

DNS: Domain Name System

FOSS: Free and Open Software

HRPC: Human Rights Protocol Considerations

HTTP: Hypertext Transfer Protocol

HTTPS: Hyper Text Transfer Protocol Secure

ICANN: Internet Corporation for Assigned Names and Numbers

I-D: Internet-Draft

IETF: Internet Engineering Task Force

IRTF: Internet Research Task Force

NGO: Non-Governmental Organizations

PM: Pervasive Monitoring

QUIC: Quick UDP Internet Connections

RDAP: Registration Data Access Protocol

RFC: Request for Comments

STS: Science and Technology Studies

TCP/IP: Transmission Control/Internet protocol

TLS: Transport Layer Secure

UDHR: Declaration of Human Rights

UDP: User Datagram Protocol

UN: United Nations

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1. Introduction

> The Internet isn't value-neutral, and neither is the IETF. We want the Internet to be useful for communities that share our commitment to openness and fairness. (…) These concepts have little to do with the technology that's possible, and much to do with **the technology that we choose to create**.
>
> (source: RFC 3935, emphasis mine)

The Internet was built on technical standards.[1] The first iteration of the Internet was driven by the need to connect disparate networks. Internet standards enabled such "internetworking" by standardizing how networks exchanged data. For example, the Transmission Control/Internet protocol (TCP/IP)—the suite of protocols that enables packet routing—provided the foundation for Internet applications and services (Faltstrom 2016; Mathew 2014). These standards were developed in industry-led standard setting bodies, like the Internet Engineering Task Force (IETF).

Shrouded in acronyms, the IETF's work remains crucial to the Internet's current functioning and governance. Over the last three decades, it developed multiple additional Internet standards, and remains at the forefront of application and networking protocols. The IETF developed the widely-used Hypertext Transfer Protocol (HTTP), the security protocol Transport Layer Secure (TLS), and the Quick UDP Internet Connections (QUIC) protocol—the first new transport protocol deployed on a wide-scale in two decades.

Questions familiar to Internet governance scholars and digital anthropologists are hidden in the IETF's discussions and argot of abbreviations. For example, debates about token binding in Hyper Text Transport Protocol Secure (HTTPS) are fundamentally about online identity management. Whether to include "spinbits" in transport protocols like QUIC demands weighing the privacy needs of users with industry needs to monitor networks. Conversations about the Registration Data Access Protocol (RDAP) gravitate around how to define what information about domain name registrations

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[1] With regards to terminology, this article follows the convention set by Denardis, who in her 2013 book "protocol politics" uses the term protocol synonymously with the term technical standard or standard.

is accessible, and to whom. IETF standards inherently raise questions about whose norms are being translated to networked technology through standardization, and what role culture plays in this process. However, to date there has been limited anthropological inquiry of Internet governance or Internet governance cultures.

This article is an anthropological case study of efforts to include human rights considerations in IETF standards. I analyze recent human rights advocacy efforts by a small group of human rights advocates and engineers between 2014 and 2017. I ask what happens when human rights advocates join the IETF? How do their values and goals conflict with those of IETF engineers? Where is "rough consensus" found in the debate about the relationship between protocols and human rights? Cultural anthropology uses interviews and ethnography to provide an *emic* account of the world as understood by those in it (Kottak 2006). Here, I use these methodologies to provide insight on how IETF culture shapes protocols and attempts to introduce new norms into their design. Such anthropological research is of interest to scholars debating Internet governance.

I bring together Internet governance literature from two main areas—the role of human rights advocacy in Internet governance and the infrastructural turn—to reconcile the debate about the specific contribution of civil society to standardization in the IETF. I also propose Internet governance research has entered a new phase of research characterized by reflexivity. This phase calls for research that considers organizational culture and discusses how Internet governance practioners persistently resist human rights interventions and cultural change.

This article contains six sections. In the following section, I present my case study context and research questions. Section three introduces my methods. Section four reviews Internet governance, focusing outstanding questions about the role of human rights advocates in the IETF and on epistemic limitations of the recent infrastructural turn. Section five presents my findings of how IETF participants view technology and its effects on human rights advocacy efforts. Section six outlines my conclusions and discusses contributions to ongoing academic debates.

2. Case Study and Research Questions

In October 2014, two human rights advocates presented a bold idea to the IETF. They wanted to research how Internet standards and protocols2 impacted human rights and develop guidelines that IETF engineers could use to mitigate the negative impact of their work on human rights. To do so, they set up a Human Rights Protocol Considerations Research Group (HRPC) in the Internet Research Task Force (IRTF).3 In October 2017, after three years of elaborate online and offline discussions, these human rights advocates published Request For Comments (RFC) 82804 "Research into Human Rights Protocol Considerations," which outlines human rights protocol considerations. RFCs are the IETF's formal document series, in which its standards are published. However, even after publishing, the human rights advocates had limited success in getting IETF engineers to use it or incorporate its claims about the relationship between protocols and human rights into their cultural understanding of protocols.

To develop RFC 8280, a core group of three people formed the HRPC group. The group consisted of one lawyer who ran a digital rights organization in Brazil, a public interest technologist working for an international freedom of expression organization in the UK, and a long-time US-based IETF engineer with a background in communication rights advocacy. The HRPC group provided a dedicated convening space for human rights advocates. Throughout its 30 years existence, several civil society and public interest technologists actively participated in the IETF (Cath & Floridi 2017; Morris 2011), yet this was the first time the community had a dedicated human rights research group.

From 2014 and 2017, the core-group of contributors to the HRPC group fluctuated between 15 and 30 people. The overall size of the group, as measured in active participation in the HRPC discussions online and offline, totalled about 75 individuals. Around a third worked for industry, a third for NGOs, and a third in academia. A minority of individuals worked for government or other Internet governance organizations. In this article, the term "human rights advocate" refers primarily to people

2 This article follows the terminology set out by Denardis by using the terms protocol and standard interchangeably (Denardis 2009, 6).
3 The IRTF is the research subsidiary of the IETF, focusing on long term research to inform standardization.
4 See here for RFC 8280 https://trac.tools.ietf.org/html/rfc8280 As the careful reader will note, I am listed as a co-author of RFC 8280. In 2014, I wrote my master dissertation on HRPC and as part of that ethnographic work I became one of two penholders for RFC 8280. Early in my PhD, I decided to keep that position as it allowed me to closely follow the discussion, get public and private input on the progress of the work, without being expected to engage in the content of the discussion (as pen-holders are usually not process drivers but rapporteurs). Being involved in the process of creating a Request For Comments (RFC) from start to finish helped me, as Diesing (1972, 291) states: "learn the concepts and distinctions [of a culture] not just by asking people or reading an article but by participating".

working for NGOs or those who self-defined as such. For my other interlocutors I apply the term "IETF engineer". The HRPC group's offline meetings were often attended by up to 120 people,[5] and discussion about human rights regularly boiled over from the HRPC group to the IETF at large. For example, in March 2017 one of the HRPC chairs was invited to discuss human rights and protocols during the plenary meeting[6] of IETF 98 in Chicago.

Human rights advocates started their work in the IRTF but aimed to include human rights as structural considerations for standards development in the IETF. Many of the individuals participating in the HRPC group and discussing human rights were also active IETF engineers. As such, throughout this article I discuss my findings in terms of the IETF's organizational remit and culture. In this article, I approach human rights following the definition set out by the human rights advocates. They define human rights according to the United Nations (UN) Universal Declaration of Human Rights (UDHR). I have not included ongoing policy and academic discussions about the genealogy of human rights (Alston 2013) or their continued relevance (Alston 2013; Hunt 2008; Jensen 2017; Moyn 2012), especially in application to non-state actors. These discussions did not surface in my data analysis and as such I deemed them out of scope for this article.

The process of negotiation in HRPC situates human rights advocacy in the cultural context of Internet governance at the IETF. My qualitative research was guided by the following research questions: (1) How do IETF participants understand Internet standards? (2) How does this understanding shape human rights advocacy efforts? Deploying anthropological methods provides a detailed picture of how IETF participants choose to create technology, and what consequences this has for the ability of the human rights advocates to achieve their goals.

Specifically, I argue that the dominant understanding of the nature of technology in the IETF undermines human rights advocates' efforts. That is, IETF engineers speak about protocols in terms of functional connectivity, permissionless innovation, interoperability, and openness. These

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[5] The IETF keeps limited formal data on participation numbers for each working group or mailing list. As such, it is difficult to compare the engagement in HRPC with other groups. However, over the last three years I followed and participated in other research groups. Many of which have equal participation numbers as HRPC but were less contentious in terms emails sent and tone. There are some interesting methodological questions around how to operationalize what participation or contention means. Because of the way that IETF and IRTF mailinglists are set up, for researchers it is only possible to see who responds on the list, as opposed to all the people that are subscribed to a list. Together with several other researchers, I am exploring how to improve current methods for researching mailing list conversations (Benthall 2015).

[6] See here for a write up of this discussion: https://www.ietfjournal.org/ietf-debates-its-role-in-supporting-human-rights-via-internet-protocol-development/

understandings reflect IETF culture, in the sense that they reproduce the tacit normative framework that underlies the engineers' dominant understanding of protocols as fundamentally non-prescriptive, voluntary, and opt-in. This cultural understanding of technology, in turn, illuminates why IETF's engineers resist and largely dismiss human rights advocacy efforts.

3. Methods

My overarching doctoral project, on which this article is based, investigates how human rights advocates shape IETF standard development through a multi-event ethnographic study. Between 2016 and 2020, I engaged in online and offline participant observation at the IETF. During this time, I participated in 14 IETF meetings, 5 in person and 9 online. I also participated in-person by organizing workshops around the topic of human rights at 3 Internet Governance Forums (IGF) and several national IGFs. I used these adjacent meetings to do interviews and observe human rights advocates in the broader Internet governance community. I also conducted 65 semi-structured elite interviews. The interviews lasted between 60 and 90 minutes on average. When possible, they were conducted face-to-face during, or around, IETF meetings. Ten interviews were conducted online due to scheduling conflicts.

My interview sampling strategy was a combination of purposive sampling (Guetterman 2015; Palinkas et al. 2015) and subsequently snowball sampling (Patton 2002). For the purposive sampling, I drew from my prior experience in the IETF, as well as from archival research including document and mailinglist analysis. I used my existing network, working with insider references (Ostrander 1993) and making strategic use of gate-keepers (Harvey 2011; Richards 1996) to gain access. I identified the most prolific contributors to the online and offline HRPC conversations and contacted them for interviews. Based on my participant observation and initial set of interviews, I developed a further set of interviewees. For each of these, I would round off my conversation by asking my interlocutors to name five people they think I should talk to. This snowball approach informed my final interviewing phase until I reached saturation (Saunders et al. 2018; Guest, Bunce, and Johnson 2016; Fusch and Ness 2015). I transcribed the recorded interviews and analyzed them using a combination of manual coding and qualitative coding software NVIVO.

Coding qualitative data is similar to developing running code for the IETF: at its core, it is about defining the relationship between different concepts such that they provide insights into the

functioning of a network, whether between machines or humans. I analyzed data from my archival and participant observation to inform my interviews (Aberbach & Rockman, 2002), relying on a critical constructivist grounding (Kincheloe and McLaren 2005; Wyn Jones 2001). For the data analysis, I used a mix of the coding, category handling, modelling, and writing models as defined by Saldaña (2015), allowing me to dynamically develop theoretical insights.

The methods I used have several constraints. First, they reflect the insights of the people I interviewed and "hung out" with during fieldwork. I included a diverse cohort of interviewees and exposed myself to a wide range of IETF and IRTF processes. However, like all anthropological research that emphasizes the situated nature of knowledge, I do not claim that my findings are complete or universally applicable. Rather, I present a situated account of human rights advocates in the IETF within a specific timeframe that provides a window into IETF culture. Second, IETF culture is malleable and driven by a wide variety of evolving views on the nature of technology. Still, I believe these findings can provide relevant grounding for a number of ongoing debates in Internet governance to which I turn next.

4. Literature

Internet governance literature addresses three crucial dynamics: who governs to what ends and with which means. It particularly focuses on how governments and Internet governance institutions use law, code, norms, and markets to achieve a broad set of political goals (Abbate 2000; Dutton and Peltu 2005; Hofmann 2007; Hofmann, Katzenbach, and Gollatz 2017; Kahin and Keller 1997; Lessig 2006). Over the last 4 years, a small group of researchers started explicitly considering the role of human rights advocates and public interest technologists in Internet governance using anthropological methods (Cath and Floridi 2017; Mathew 2016; Myers West 2017; Ten Oever 2020). My case study adds to this body of literature by providing an ethnographic case study of human rights advocates in the IETF, and how their efforts are hampered by IETF culture.

Culture in this article is defined as the "fuzzy set of basic assumptions and values, orientations to life, beliefs, policies, procedures and behavioural conventions that are shared by a group of people, and that influence (but do not determine) each member's behaviour and his/her interpretations of the 'meaning' of other people's behaviour" (Spencer-Oatey 2008, 3). This article's scope is not intended

to provide a comprehensive picture of IETF culture, but rather approach it through the tensions between the orientation to technology of IETF engineers and human rights advocates.

In this literature section, I am setting the stage for the discussion of my findings by bringing together two current discussions in Internet governance: the role of human rights advocacy in Internet governance and the infrastructural turn. I use these literatures to elucidate the contribution of human rights advocates to standardization in the IETF. In doing so, I make three distinct theoretical contributions to the field of Internet governance. My first theoretical contribution proposes Internet governance research is entering a new phase, defined by a critical reflexivity. This phase highlights the need for closer conversation between Internet governance scholars and those studying the cultural dimensions of the Internet in disciplines like anthropology, cultural studies, critical race studies, and critical code studies.

My second theoretical contribution responds to the ongoing debate about the role and efficacy of human rights advocates in the IETF. This debate is contentious; some academics argue that current IETF human rights efforts are misdirected (Mueller and Badiei 2018), while others hold that it is crucial to consider such public interest concerns (Morris 2011) early in the development of IETF protocols and working procedures (Musiani et al. 2015). I want to move the discussion beyond this apparent dichotomy and open up a novel line of inquiry that focuses on how these human rights efforts are imbricated with IETF culture. I do so by showing that the human rights advocacy efforts are hampered by IETF culture, particularly the cultural perception that protocols are non-prescriptive in nature. These findings show that the IETF's dominant cultural understanding of standards is not receptive to the knowledge claims made by human rights advocates about the "core functions" of Internet governance.

My third theoretical contribution lies in the epistemic questions my findings raises for recent foundational work on the "turn to the infrastructure" (DeNardis 2010; Musiani et al. 2015). The "infrastructural turn" posits that the Internet's infrastructure and the organizations that maintain it are increasingly co-opted for political purposes that undermine its "original technical functions" (DeNardis and Musiani 2015, 3). I argue that drawing clear lines demarcating Internet governance functions presupposes that these functions are stable and fundamentally knowable, as opposed to culturally-contingent and socially-situated (as my findings suggest). I argue that the infrastructural turn should further incorporate the reflexivity of the fourth phase by looking towards disciplines like anthropology to find new sources of knowledge for answering outstanding questions about the nature

of Internet governance. To do so, next I present a brief overview of the last three decades of academic debate on Internet governance, giving attention to the current fourth decade I locate this article's findings in.

4.1 Four Phases of Internet Governance Research

Historically, research on Internet governance can be categorised in three phases (Hofmann 2007). In this section, I suggest a fourth one that justifies further research into the cultural dimensions of Internet governance writ-large and the specifics of how standards are developed.
Hofmann (2007) posited Internet governance as an open-ended process—"a regulative idea in flux" (2007, 1)—that never reaches consensus. Accordingly, she suggests that Internet governance should be understood through technological and political developments reflected in the forums where discussions occur. She highlighted three phases of Internet governance practice and theorizing between 1986 and 2007. An initial technical phase, during which the IETF was the main forum, was followed by a second self-regulatory phase led by industry. The Internet Corporation for Assigned Names and Numbers (ICANN) served as the forum for the second phase. Finally, there was a third formative phase. This phase was characterized by a reconfiguration of the principle actors involved in Internet governance, most notably it saw the reassertion of governments and forum diversification.

In all three phases, a specific set of actors and governance questions have been researched. These research questions were often anchored in the fields of economics, law, and international relations. In this research, governance is often defined as coordination between different actors, as well as how these informal arrangements lead to governance innovation (Hofmann 2007; Mueller 2010). However, "informal" in this definition rarely encompasses anthropological insights about Internet governance cultures. Or when it does, these works are often written by scholars in fields that are not in direct conversation with Internet governance.

Recent work from these adjacent fields illustrates how the normative worldviews of Internet governance participants shapes technological systems, sometimes with detrimental effects (Benjamin 2019b). McIlwain (2016), for instance, shows how the architecture of the web replicates structural inequality. Likewise, Everett (2002, 125) argues that the normalization of the use of "master/slave" terminology to execute commands in computer operating systems re-inscribes race and racism. Such

language is commonplace at the IETF[7] and has been at the centre of recent controversy,[8] but has not received much academic attention.[9] These discriminatory outcomes often have cultural roots.

Dunbar-Hester (2019) argues that the importance of autonomy makes open source communities resistant to rules that improve diversity. Likewise, Miltner (2020), who looks at how the UNICODE standards body for emojis—miniature digital communication pictographs—suffers from structural colorblind racism, leading to a lack of racial representation in early emoji sets. This research indicates that the tacit cultural norms prevalent in Internet governance organizations make their designers complicit in the creation of discriminatory technologies, often with adverse human rights impacts. Yet, there is limited understanding of how this happens in Internet governance organizations like the IETF.

Recent historic research on gender in computing further underscores why and how Internet governance organizations resist human rights interventions. The work of Abbate (2012) and Hicks (2017) details the structural social barriers women in computing have historically faced, including persistent gender discrimination that led to their exclusion from technical work. Traweek (1992) shows how confrontational working styles impede the ability of women to get ahead; they were less likely to display such behavior. Likewise, Reagle (2013, 1) argues that the argumentative working style of the Free and Open Software (FOSS) movement, which has many cultural similarities with the IETF, creates "informal but significant barriers to women's participation" through unaddressed misogyny and aggression.

These exclusionary effects and cultural barriers to the inclusion of human rights norms are clearly visible in the IETF (Cath 2020), yet remain largely unaccounted for in Internet governance research. Given the ideological and professional overlap between FOSS, computing, and Internet governance communities, these cultural dynamics have unexplored parallels but require theoretical and methodological grounding currently underrepresented in Internet governance research.

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[7] See for instance RFC 8163 on the transmission of IPv6 over Master-slave/Token-passing (MS/TP) Networks https://tools.ietf.org/html/rfc8163
[8] There is an ongoing discussion about the use of oppressive and exclusionary language within the IETF https://www.ietf.org/about/groups/iesg/statements/statement-on-oppressive-exclusionary-language/
[9] A number of human rights advocates as well as industry engineers in the IETF have recently raised their concerns regarding this terminology: https://www.ietf.org/id/draft-knodel-terminology-01.txt the subsequent was voluminous and the tone of the conversation often breached the IETF's code of conduct, such that on August 10th 2020 the IETF chair decided to mute the mailing list, who in her words "was not sure that threads have ever been muted on ietf@ietf.org before" reflecting the contentious nature of the discussion.

This is not to say that there are no qualitative inquiries of Internet governance. Over the past six years, a number of qualitative case studies have been conducted (Mathew 2016; Myers West 2017; Milan and Ten Oever 2016; Sowell 2012), which provide partial insights into these cultures and how they shape Internet technologies through unspoken norms and informal networks. Such qualitative studies are necessary to understand what Scholte (2020, 18) calls the performance of Internet governance through "bureaucratic rituals, dress codes, office layouts, patterns of friendship, [and] deployments of language." This article expands on these studies by undertaking anthropological inquiry building on its rich tradition of ethnographic fieldwork.

Drawing on Hofmann's phases approach, I argue we have entered a fourth phase of Internet governance research. I refer to this as the reflexive phase, when qualitative, anthropological research is increasingly necessary. I argue this fourth phase is characterized by a reflexivity on the fit of the self-regulatory governance mechanisms highlighted by Hofmann (2007) in phase three, and by a profound disillusionment with the Internet as a communication technology (Noble 2018; Vaidhyanathan 2011; Zuboff 2019). The Snowden revelations of 2013 unveiled the extent of US Internet surveillance, catalysing a perspective change that was further aggravated by a slew of tech-scandals (AI NOW Institute 2018). A number of ethnographic studies on the negative impact of Internet technologies on society (Benjamin 2019a; 2019b; McIlwain 2019; S. Noble and Roberts 2019; S. U. Noble 2018) and the "rough edges" of the communities that govern them (Cath 2020; Sowell 2012; Reagle 2013) stress the importance of further critical reflection on Internet governance.

This reflexivity, characterizing phase four, is clearly visible in recent Internet governance research. Internet governance scholars are questioning the narrow focus of the field (van Eeten and Mueller 2013), raising concerns regarding the use of the Internet's infrastructure for political means (DeNardis 2012, 2014; Musiani et al. 2015), shining new light on how current Internet governance arrangements broadly favour US interests (Carr 2015), and researching the role of trust and human connection in Internet governance (Mathew 2016; Meier-Hahn 2015; Sowell 2012). While there are few studies theorizing Internet governance through the critical-cultural perspectives applied by the ethnographic and historic studies at the intersection of open tech cultures, race and gender, Internet governance scholars are still questioning the field's philosophical underpinnings.

Ziewitz and Pentzold (2014), for example, use the notion of "performativity" to argue that the boundaries of Internet governance are maintained through "our [academic] readings of discussions, seminar presentations, articles or policy briefs" (2014, 317). Hofmann (2020, 254) makes a similar

argument about the importance of understanding the knowledge that "Internet governance produces about itself". This, she holds (2020, 265), requires researchers to "devote systematic attention to the "worldmaking" implications of discourse (its own contributions included) and seek to dismantle its power by means of a deromanticizing critique of Internet governance narratives." This reflexivity unpacks how Internet governance arises not just out of its technical design, but also out of how it is discussed and defined by academics and practioners.

Likewise, rather than aiming to make *a priori* claims about Internet governance, Flyverbom (2016) argues that the field should consider how forms of ordering and the mundane practices of Internet governance shape knowledge production, and what issues get prioritized as deserving academic attention as a result. These insights indicate that the philosophical foundations of Internet governance research remain an ongoing topic of debate, in which anthropological research can play a more constitutive role than it currently does. In terms of its evolution, Ziewitz and Pentzold (2014, 307) argue that the field of Internet governance research has been "emerging" and "under construction" for over 15 years. This perpetual "beta phase" is a function of the rapid development of the Internet and the constant evolution of how academics seek to describe governance structures.

My concept of phase four—a reflexive phase concerned with how culture replicates power dynamics—is intended to spark further debate about how knowledge claims are made about what constitutes Internet governance, and who can make those claims. Anthropology and its methodology of ethnography can add to ongoing debates about "what counts as Internet governance" (Ziewitz and Pentzold 2014, 319), by showing the political and socio-cultural functions served by technical design. These insights in turn add to ongoing academic conversation about what it means to do Internet governance (Epstein, Katzenbach, and Musiani 2016) or co-opt the infrastructure for political ends (DeNardis and Musiani 2015). To further explore what a future program of anthropological inquiry might look like, in the next section I will introduce the debate about role and efficacy of human rights advocates in the IETF.

4.2 Human Rights Advocacy in the IETF: Futile or Tour-de-Force?

A number of academics are raising questions about the role of human rights advocates in Internet governance (Bortzmeyer 2018; Brown, Clark, and Trossen 2010; Cath and Floridi 2017; Easton 2016; Liddicoat and Doria 2012; Milan and Ten Oever 2016; Morris 2011; Mueller and Badiei 2018; Orwat and Bless 2016; Rachovitsa 2016; Zalnieriute and Milan 2019; Zalnieriute 2019). Recent

literature focuses on how the Internet's infrastructure mediates rights, (DeNardis and Hackl 2016; DeNardis 2014; Musiani et al. 2015; Zalnieriute and Milan 2019). Standards in particular are considered to have implications for human rights, civil liberties, and social justice (DeNardis 2011; 2012; 2014; Cath and Floridi 2017; Morris 2011; Hackl 2016; Bradshaw and DeNardis 2019; Deibert et al. 2008; Milan and Ten Oever 2016).

Private standards bodies and their engineers historically have considered these implications (Abbate 2000; Braman 2011). Increasingly, human rights advocates working for Non-Governmental Organizations (NGO) also engage in these debates (Cath and Floridi 2017; DeNardis 2014; Milan and Ten Oever 2016; Morris 2011). Regarding the role of these human rights advocates and their efficacy in Internet governance, there are several conflicting academic findings. Among these, in this section I will focus on conflicts specific to the IETF.

Various Internet governance scholars have researched the efforts of human rights advocates in the IETF. Their work largely falls into two categories: those arguing that human rights advocacy provides meaningful guidance to standardization, and those who argue it does not. As mentioned, I want to move beyond this dichotomy by focusing on how these human rights efforts are imbricated within IETF culture. Rather than determining that these efforts wholesale succeed or fail, I analyze the cultural assumptions and views that drive these efforts, to contextualize their effects in Internet governance. My cultural approach adds nuance to an ongoing debate about the efficacy of human rights advocates in the IETF.

Several authors writing about human rights and civil society interventions in the IETF argue that these actors provide meaningful and necessary contributions to Internet governance. For example, Morris (2011) argues that the contribution of civil society to standardization bodies is important because they represent interests, users and concerns not naturally considered by the IETF's corporate participants. Roger and Eden (2017, 802–3) similarly argue that, "connecting human rights activists and standards developers holds great promise in beginning to frame technical standards in terms of their social impacts and consequences. In future, the IETF may even embed this work directly into standards development." Other academics simply argue that the IETF's work is inherently political. For this reason, they call for further research on how human rights values and actors can guide the IETF to be more mindful of the impact of protocols on human rights (Cath and Floridi 2017; Orwat and Bless 2016; Ten Oever 2020).

Yet, not all academics are supportive of human rights efforts. Mueller and Badiei (2018) argue that current human rights advocacy efforts in the IETF—the same ones at the centre of this article—are futile because the advocates adopt a technologically-deterministic stance. That is, human rights efforts fail to influence the development of standards because the approach oversimplifies the relationship between technology and society. These critics locate the onus of this failure with the human rights' advocates framing of the problem. They briefly mention that "the IETF is an environment where certain values favoring Internet freedom, and a culture rooted in high-tech industries and universities, prevail" (2018, 9), but do not go into depth on how this culture shapes human rights advocacy.

DeNardis researches public interest representatives in the IETF, as her work predates the HRPC group. She argues that while important, their impact is limited because their participation does not create additional legitimacy for these bodies, does not scale, and is corporate funded (DeNardis 2014, 91). These discussions hint at the imbrication of civil society efforts with IETF culture, but do not go into great depth on the cultural barriers to advocacy efforts succeeding. Academics most critical or most supportive of the human rights efforts touch on, but do not theorize their findings in terms of, IETF culture.

Within this debate there is room for further empirical substantiation of these various positions through scholarship grounded in an organization's culture. Such research, as these authors suggest, should consider the IETF's idiosyncratic culture as well as how its engineers and human rights advocates make sense of the work they do. Rather than imposing *etic* indicators to either dismiss or encourage these human rights efforts, I approach them through the IETF's culturally informed view of protocols as non-prescriptive. I try to show that what we can know about Internet governance, should at least in part, be rooted in what is known by its practioners. In the next section, I pick up on this theme by considering its implications for the ongoing academic debate about the recent "infrastructural turn" in Internet governance.

4.3 The Turn to the Infrastructure: Co-optation or Core Objective?

Over the past decade or so, Internet governance as an academic field has taken a "turn to the infrastructure" (DeNardis 2012; Musiani et al. 2015). The central premises of this approach are twofold. The first premise is that the infrastructure of the Internet, and the organizations responsible for its governance, are sites of economic and political power used by academics, governments, civil

society, and industry. The second premise is that these sites are used—or *co-opted* as the academics postulating this turn suggest—for purposes "beyond their original constructed technical and policy functions" (DeNardis and Musiani 2015, 3). In that same chapter, DeNardis and Musiani define co-optation as "the use of Internet infrastructures and systems of governance—such as the DNS—for purposes other than those for which they were initially designed" (2015, 5). There are outstanding questions regarding the turn's philosophical foundations. I will highlight two directly relevant to this article and use them to critically reflect on what my case study adds to the first and second part underlying the central premises of this turn.

Some Internet governance academics question the first part of the premise. They argue that infrastructure has always played a prominent role in political discussions (Mueller and Badiei 2018). This is true—as Musiani et al. (2015) acknowledge, infrastructure has permanency as a site of political contention. They don't argue that there is anything completely new about Internet infrastructures being used as proxies for politics. Rather, they argue that the current use of infrastructure is more blatantly political than before. In their words, the infrastructure is used to "carry out functions completely extraneous to the core technological objective of the system" (2015, 19). Musiani et al. (2015) argue that using infrastructure as a proxy for external functions raises questions about the "unintentional consequences of these developments for the stability and security of the Internet as well as human rights online" (2015, 19).

The crux of their argument, thus, lies in the second premise of the infrastructural turn—how sites are co-opted. Hence, a different way to build on this turn would be to problematize how it can be known whether something constitutes an "original technical or policy function" or a "co-optation of the infrastructure." Concurrently, a related line of inquiry could examine whether co-optation is inherently bad,10 as suggested by case studies concerned with the negative effects on human rights when a standards' development is co-opted (Musiani et al. 2015). Doing so requires on the ground insights into the core functions of the infrastructure and the effects of its political use for human rights.

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10 In her 2012 article DeNardis focuses on the use of the infrastructure for content control by political actors, as their traditional mechanisms for information control are limited by the Internet. Some of the same epistemic issues highlighted here come up in that article, however, its framing around content control as outside of the bounds of infrastructure provides a strong departure point for refining the outstanding epistemic questions regarding the turn to Internet infrastructure.

The second question raised by the infrastructural turn's premises concerns epistemology. The principle proponents of the infrastructural turn provide limited background regarding how they delineate the "original technical and policy functions," or what sources of knowledge can be brought in as evidence to define them.[11] Considering the multiple histories of the Internet's development (Abbate 2000; Clark 2018; Turner 2010, 2017)—and the technical, commercial, socio-political, cultural functions it serves (Braman 2011; Carr 2015; DeNardis 2010, 2011, 2014; Musiani et al. 2015)—it is evident why defining such sources of knowledge is difficult.[12] The functions of the Internet evolved with its role in society, making it hard to develop static indicators for its original functions. The lack of clarification on what constitutes the core functions of the infrastructure leads to methodological difficulties when trying to determine whether a particular use is co-optation.

My anthropological study is uniquely positioned to provide new insights into what constitutes "original technical and policy functions" or co-optation of the infrastructure. Its theoretical and methodological orientation geared towards showing how humans understand the world. The value of anthropology to the study of Internet governance lies in its ability to unearth the assumed natural worldviews, knowledge practices and categories that define the Internet governance. Applying anthropological tools to the infrastructural turn allows me to surface how cultural forces shape the functions of the Internet's infrastructure. It also enables me to ask how things could be different, given that Internet governance functions, practices, and protocols are neither natural nor inevitable. Critically analyzing the theoretical limitations of the infrastructural turn by building on anthropological research aligns with the reflexive focus of the fourth phase of Internet governance I define above.

Addressing the epistemic limitations of the turn to the infrastructure also matters for the practice of Internet governance. As mentioned, how Internet governance scholars define particular uses of the Internet's infrastructure—for instance, around human rights advocacy—impacts how those uses are

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[11] For example, Musiani (2016) argues that the debates about the development of decentralized alternatives to the DNS show "how Internet governance infrastructures are increasingly being co-opted for political purposes irrelevant to their primary Internet governance function (…) (p. 73-74). Later in that same piece, she cites these functions to be: "name registration (…), name resolution (…) and trust". She does however not provide an in-depth explanation for how it can be known that these three functions are core, nor does this example elaborate on the fundamental social (as opposed to technical) nature of trust (Mathew 2014; Meier-Hahn 2015). Earlier work by DeNardis reflects the fundamentally embedded nature of Internet governance: "This technical architecture is not external to politics and culture but, rather, deeply embeds the values and policy decisions that ultimately structure individual freedom online and the pace of Internet innovation." (2013, 22) and raises questions similar to those in this article as to how these cultural dynamics play into current theorizing about the use of the infrastructure for political purposes.

[12] This debate goes back to the Internet's initial development. Abbate (2000, 1), for instance, details how "for many years there was no consensus on what its [packet switching] defining characteristics were (…) in part because computer scientists evaluated it in ideological as well as technical terms".

seen and acted upon by Internet governance practitioners and regulators. It is also important in light of the permanency of the Internet's infrastructure as a platform for politics (DeNardis 2010, 2012, 2011; Hackl 2016). As the Internet becomes ever more widely embedded in all aspects of society (DeNardis 2020), policy makers and legislators are strengthening their calls for the application of the human rights framework to Internet governance (Jørgensen 2019; Zalnieriute and Milan 2019). Empirical understanding of what happens when this call is answered is crucial to guiding future policy, advocacy and standardization efforts. I turn to this in the next section where I present my empirical findings of how IETF participants view technology and its effects on human rights advocacy efforts.

5. Findings: Running Code, Culture, and Choice

The IETF's unofficial mantra holds that: "We reject: kings, presidents and voting. We believe in: rough consensus and running code." In this section, I surface IETF participants' beliefs about standards. In particular, I illuminate their tacit and normative understandings of standards to argue that IETF engineers' understanding of technology is bound by a commitment to protocol non-prescriptiveness—the idea that the IETF should not prescribe how its technologies are used. This protocol non-prescriptiveness is at odds with the perceived prescriptive approach of the human rights advocates, who seek a "rights-protecting" outcome of standard design and implementation. These findings provide insights into debates about human rights advocacy in the IETF. How standards are understood and acted upon also provides a source of knowledge—thus far untapped—for defining what constitutes the "original technical and policy functions" (DeNardis and Musiani 2015, 3) of IETF standards.

Many of my interviewees spoke about standards in terms of connectivity, interoperability, permissionless innovation, and openness. These four terms are featured prominently in IETF and IRTF documents and rhetoric as well as in Internet governance literature. Connectivity, interoperability, permissionless innovation and openness are also discussed as the technical values that led to the Internet's proliferation (Faltstrom 2016; van Schewick 2011; Zittrain 2008). Throughout this section, I show that these values represent a social preference as much as technical prerequisite; they reflect not just the technology that is possible, but also the technology that the IETF *chooses to create*. Reframing the IETF's dismissal of human rights values as the result of deliberate human choice—instead of as a technical incompatibility between human rights and

standards—provides a novel perspective on barriers to human rights advocacy in Internet governance. My ethnographic, anthropological approach analyzes the cultural assumptions and discussions that resulted in the limited uptake of human rights values, rather than adding to current debates evaluating the merits of the human rights advocates work.

5.1 Connectivity

> The community believes that the goal is connectivity, the tool is the Internet Protocol, and the intelligence is end to end rather than hidden in the network.
>
> <div align="right">(Source: RFC 1958)</div>

Connectivity is a reoccurring theme in how IETF participants spoke about standards. In the eyes of my engineering interlocutors, connectivity involved machine (rather than human) connection with the goal of network growth. In the next paragraphs, I will show how this dominant cultural understanding of connectivity created friction between IETF engineers and human rights advocates, two parties who held opposing views of the constituency and the purpose of standards. To do so, I first elaborate on how IETF engineers and human rights advocates understand connectivity differently. In the IETF, connectivity is often understood as the ability of systems to connect to each other. Braman (2011, 300) refers to this as connection between *daemon* users, rather than human users. My data confirms the prevalence of this daemon-centric understanding of connectivity in the IETF. As one IETF engineer told me in an interview:

> I am a fan of some of the [HRPC] work to define network segments as associations, but that obviously will create push back of people who view machines and implementations completely separately from their human manifestation. I think that kind of language just won't carry weight here.

This quote reflects a common response I got when asking IETF engineers about the relationship between human rights and standards: there was none. IETF protocols served to enable machine-to-machine communication. By insisting that humans were not the (primary) entities served by standards, IETF engineers dismissed the need for including human rights considerations in their development. Many human rights advocates, however, saw connectivity as the ability of humans to connect to each other. The tension arising from this difference in how connectivity is understood complicated the human rights efforts. Such tension reached beyond the daemon-human dichotomy; disagreements extended into what different participants saw as the goal of connectivity.

In the IETF, connectivity is often publicly discussed as an end, as opposed to serving a social goal. For example, RFC 1958 "Architectural Principles of the Internet", quoted above, focuses on connectivity as its own right. It reads, "The current exponential growth of the network seems to show that connectivity is its own reward and is more valuable than any individual application such as mail or the World-Wide Web." This definition situated connectivity as an ontological good. Yet, who is served by connectivity was implied by these various documents and statements. For many of my interlocutors, connectivity served a wide range of Internet uses and services, making them faster and more resilient. In turn, resilience and speed was good for their profit models. In the words of one engineer I interviewed:

> Connectivity is about money. Money and leverage. Money is leverage. We see that, for example, with the new Google transport layer protocol QUIC. They talk about in terms of improving connectivity for all by reducing latency, but that also comes with financial benefits for them. Let's not forget that.

RFC 1958, in a similar vein, focused on how connectivity supported the business model underpinning the companies attending the IETF. It read, "Connectivity requires technical cooperation between service providers, and flourishes in the increasingly liberal and competitive commercial telecommunications environment." In other words, the implicit goal of connectivity is income generation, a commercial approach underpinned by liberal, market-driven business models and laissez-faire technology development. Connectivity is easy to articulate as a shared goal for standards, because it communicates tacit assumptions about the importance of machines, money, and markets—without explicitly privileging a particular set of customers, companies, or outcomes. This commercial view of connectivity differed fundamentally from that of the human rights advocates.

The human rights advocates built on RFC 1958 to reframe the nature of standards. In the words of one advocate on the mailing list, "We believe that our goal, consistent with RFC 1958, is for the Internet to continue to serve as a tool enabling connectivity among all people." In the HRPC working documents, including its charter and RFC 8280, the advocates explicitly relate their human rights goals to the importance of enabling Internet connectivity *for humans*. Their efforts to reframe standards as for humans, rather than machines or commerce, was resisted by many IETF engineers. They believed a human-centered approach contravened the tacit technical and commercial goals enabled by unfettered connectivity. The appeal of connectivity was that it served a wide range of

industry interests, making it too valuable to give up in favor of a narrower focus on human rights concerns.

In short, IETF engineers and human rights advocates saw connectivity as a fundamental function of standards. Connectivity has a distinct meaning, purpose, and constituency. According to many engineers, connectivity was daemonic, enabled more (ontologically good) connectivity, and market driven. This view clashed with the human centric approach of the advocates. As mentioned, many of the IETF engineers I interviewed emphasized the universal appeal of their liberal approach to connectivity. It came up repeatedly in my interviews and on the HRPC mailing list. In the words of one engineer, "If there is an ethic of the Internet, it is this: that more internetworking is better because that makes the Internet better connected." It is apparent from this quote that the IETF engineers not only view connectivity as an ontological good, but that network growth is the Internet's overarching purpose. This growth had to happen in a particular way, through permissionless innovation. In the next section, I discuss permissionless innovation as another key theme in how IETF engineers understood standards.

5.2 Permissionless Innovation

Permissionless innovation is the ability of any individual to connect networks or innovate by building applications and services that run on top of the Internet, without permission from a central authority. The absence of a single source of authority is how IETF engineers understood standards. In my interviews, they characterized standards as being the result of the individual choice to develop and implement protocols. As one interviewee explained, "The good thing is that the IETF is not the protocol police, because the Internet is permissionless, people can design the protocol and implement and deploy it without the authorization of the IETF." They saw standards as the result of volunteer engineers coming together and growing the network, without that work being mandated, guided or curtailed by a central authority. This painted a picture of standards as being understood through what I call "protocol non-prescriptiveness"—a view of standards rooted in liberal notions of freedom and autonomy. This view ties directly to how they valued the human rights advocacy efforts.

Many IETF engineers resisted these efforts, because they saw it as trying to re-orient standard development towards humans instead of machines. They believed it would move the IETF towards being a centralized authority reflecting the shape of the international body of human rights and the legal entities tasked with enforcing it (i.e., states and intergovernmental organizations) instead of

growth through permissionless innovation. This proposed reorientation broke their tacit assumptions about the nature of standards, as well as the overarching purpose of the Internet. As one of my interviewees said:

> It [the Internet] cannot stand still. If you were to give, a face and a body. It would be a very demanding person that wants to evolve, that wants to grow, to do things. That is how it was created. It is open, by the time that you make something open it means that you know… things will start coming in that will make it grow and grow and grow. And like, closed systems they never grow. They grow and they reach a peak, and that is it.

This quote shows that the IETF's cultural understanding of the Internet's continued existence was dependent upon its ability to grow and its designers to innovate. The human rights efforts were perceived as undermining that growth. In the words of one IETF engineer assessing the human rights' work:

> I mean, I think that there is a general agreement that human rights are important, and we can acknowledge international human rights standards and we can even refer to them in the IETF. But when it comes down to really putting restrictions on the daily practices of the entities involved in this whole ecosystem, then it becomes controversial.

When engineers were asked to consider an external source of authority (human rights) in their work, the human rights advocates were cast as a threat to the permissionless part of innovation. Some of the tensions between the human rights advocates and IETF engineers were also rooted in the opposing views regarding the purpose of the Internet. In discussions about permissionless innovation, many IETF engineers stressed that standards were rooted in voluntary agreement to exchange data across diverse networks. As one wrote, "By definition, the Internet is a network of network "…" Each participating network makes its own rules, including the rules about how to interconnect." This statement reflected the general sense amongst IETF engineers that standards cannot be mandatory. The Internet worked because different stakeholders saw mutual benefit in cooperating, without being forced by a central authority. This understanding of standards surfaced repeatedly. One engineer wrote to the mailing list:

> Keep in mind, there is no duty whatsoever to route someone else's packets. There is no duty at all to peer, and therefore there needn't be any contract or any "process in place for … de-peering". This non-contractual basis for collaborative growth is in fact what makes the Internet grow the way it does.

The IETF engineers rejected the advocates call for including human rights considerations in standards development. They felt that requiring people to include them ran counter to the prevailing ethos of decentralized development. Many saw human rights as guiding relations between governments, and worried that human rights would undermine their ability to work without explicit government oversight. As one told me:

> I am not convinced human rights fits in the IETF. I am willing to be told otherwise, but when we talk about the political world of human rights, what comes to my mind quickly is the International Telecommunications Union (ITU) or something like that, in which the question becomes, "Madame chairwoman, I would like to speak about the gentleman from 'Slowbovia,' who has just said something with which I disagree."

IETF engineers saw the decentralized and voluntary nature of standards as fundamental to the Internet's continued functioning. Becoming more prescriptive in how it should occur was seen as directly harmful to both the Internet and the IETF. This understanding of standards as decentralized ran counter to the goals and claims introduced by human rights advocates. They believed that standards needed to serve humans and should be geared towards the social goal of respecting their rights. Even though the advocates did not advocate for changes that would fundamentally hamper permissionless innovation, many engineers worried that introducing human rights into standards design would undermine the IETF's decentralized and voluntaristic approach to internetworking. The tensions between these differing articulations of permissionless innovation remain unresolved, and play an important role in explaining why, at the time of writing, the human rights RFC (RFC 8280) sees limited[13] uptake.

5.3 Interoperability

A third theme that came up repeatedly in the conversations about the nature of technology was interoperability, which provides another avenue for understanding how the human rights efforts were

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[13] At the time of writing, there was only a few IETF RFCs that included a human rights protocol considerations section. RFC 8492 Secure Password Ciphersuites for Transport Layer Security (TLS), published in February 2019, for example reads: "At the time of publication, there was a growing interest in considering the impacts that IETF (and IRTF) work can have on human rights (…). As such, the human rights considerations of TLS-PWD[13] are presented here. (…) The most fundamental of Human Rights is the right to protect oneself. The right to keep and bear arms is an example of this right. Implementations of TLS-PWD can be used as arms, kept and borne, to defend oneself against all manner of attackers -- criminals, governments, lawyers, etc. TLS-PWD is a powerful tool in the promotion and defence of universal human rights." This text shows that the inclusion human rights as structural engineering considerations can have unintended consequences. In this case, it led human rights to be subverted beyond the purposes originally stipulated by human rights advocates, for pro-gun advocacy. In my doctoral thesis, I explain in detail why and how this happened and what it means in terms of the ability of human rights advocates to shape Internet governance.

entangled in IETF culture. The need for networks to interoperate and facilitate exchange of information led to the creation of the IETF (Abbate 2000, 5). Echoing this concept, one IETF engineer wrote on the HRPC mailing list, "Indeed, the very point of standardization is to enable a core minimum of interoperability, and the question is whether or not this core minimum of interoperability should be explicitly designed with a focus on human rights." This quote emphasized the importance of interoperability and the ambivalence around the role of human rights.

This ambivalence became more tangible when understood from the earlier mentioned "protocol non-prescriptiveness." In the IETF, interoperability, like connectivity, was often conceptually anchored in voluntary agreements between network operators to facilitate efficiency and innovation. As mentioned in the previous section, the human rights advocacy efforts were based on particular articulations of the nature of the network that ran counter to those held by many IETF engineers. The debate about interoperability followed a similar pattern. Interoperability was often qualified in terms of the voluntary, non-contractual nature of standards. One engineer explained on the mailing list:

> We write them [standards] _not_ because they have some sort of "standing", but because we need conventions. Getting the benefit of the Internet relies on interoperation without explicit agreements among the various parties. RFCs are, basically, advice for interoperation. "If you do it this way, then you'll interoperate. If you don't, you might not." The IETF is notable for its total lack of a protocol police force, and that's because we're not writing law. We're writing guides for how to interoperate. It's still your network; you can make your own rules if you want. You just won't get the benefits of interoperation.

This view of the Internet as a set of independent networks tied together by the shared benefits gained from interoperation was held by many in the IETF. Individuals were free to choose how and when to interoperate, because interoperation couldn't be forced. Accordingly, engineers believed they should not try to "police" how different individuals run their network.

Interoperability was thus central to how IETF engineers viewed standards. The efforts of the advocates and their human rights considerations were perceived as undermining a view of unenforceable interoperability. In the words of one engineer: "All that [standards] needs to be consistent and predictable, you cannot create a suite of human rights considerations for protocols, then a completely different suite for whatever because they need to be interoperable. Everything on the Internet needs to be interoperable in order to make sense." IETF engineers saw the human rights advocates as prescribing not just how to develop standards, but also how and when to interoperate.

Instead of focusing on mutual benefit, engineers felt the advocates tried to force a foreign view of technology on them. A similar dynamic arose when discussing openness.

5.4 Openness

Openness is another crucial concept through which IETF engineers understand standards. There is no single definition of openness, nor definitive guidance on how it should be operationalised (DeNardis 2011). Existing literature indicates that openness is not a given, since there are many other ways the Internet could have been built (Lessig 2006; van Schewick 2011; Zittrain 2008). This in turn, clarifies why it is important to understand what is meant by openness in the IETF and how it shapes human rights efforts. Within the IETF, openness mirrored the articulation of connectivity, and principally referred to the ability of nodes to freely connect. Discussing why the IETF chose the Internet over alternative models like the Catenet14, one engineer wrote:

> What you don't get in that model [Catenet] is what we get from the Internet model, which is each node in the Internet is part of the same, if you like, overlay. And you get the end-to-end principle of the mechanisms by which any node talks to any other node are the same. The result of that is, when we evaluate that, and say one of them is better than the other, there is a whole bunch of reasons that we could come to that describe them in technical terms but ultimately it comes down to the fact that the end-to-end model is a statement about the ability of two nodes—and therefore the people connected to those nodes—to directly interchange.

The IETF could have built a Catenet, but it chose not to. Catenet might have performed similarly, but in comparison to the Internet, it would have introduced additional points of control. The decision to build one network over another demonstrated a social preference for an Internet that minimized control. Conversely, the notion of openness—as the opposite of control—was often explicitly mentioned as constitutive of the IETF. RFC 7704, which outlines its professional code of conduct, stated that, "The process of producing today's Internet technologies through a culture of open participation and diverse collaboration has proved strikingly efficient and effective, and it is distinctive among standards organizations." Voluntary collaboration, rather than control, was part of all facets of IETF standards, from their technical constitution to the governance processes through which they were designed.

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14 In a Catenet model, the network of networks is composed in a way where there are firm borders between each network. For further information about Catenet models, see: https://www.rfc-editor.org/ien/ien48.txt

In their articulation of the nature of technology, IETF engineers stressed the importance of openness as freedom from coercion. These cultural beliefs around openness were also applied to guide human interaction between IETF engineers. I often heard the mantra that, "in order to participate in the IETF all one needs is an email address and an Internet connection." Or as one of my interviewees bluntly put it, "any fucker with a mail address can start whining about your standard on a mailing list." Discussions about human rights also included references to the openness of IETF working procedures. For example, in one particularly contentious discussion about the development of RFC 7258 on Pervasive Monitoring (PM) the question was raised whether protocols were political. To diffuse the heated tone of the ensuing discussion, one engineer focused on the importance of the open process through which RFC 7258 came into existence. He wrote:

> What's important is that we followed our documented, open consensus process in publishing that statement, and that we made sure it was relevant to our work. Some people think that RFC was overreaching; others think it didn't go nearly far enough, so it's probably about right.

Hence, the IETF community also used the technical function of openness to alleviate social friction between engineers and human rights advocates. Openness—articulated as the freedom to connect and the minimization of control and oversight—was crucial to IETF engineers' understanding of standards. It served as the guiding principle for running code, as well as guiding human interaction in the IETF community. This is how the IETF's understanding of standards worked its way into its culture, norms, and values that guided standards design. The reciprocal relationship between the IETF's technical functioning and its social norms suggested they are more tightly intertwined than many scholars currently believe.

Even though the human rights advocates closely followed the technical requirements for running an IRTF group and publishing their RFC, their work directly contravened the cultural requirements regarding what constituted standards. One IETF engineer explained what this meant for the human rights advocates work, saying that, "The problem is that it will be seen as didactic by the community that it is meant to influence. And far from achieving what it wants, there is a risk that it could back-fire. It gives ammunition to the enemies of groups like the HRPC, at times." This quote captures my argument that standardization in the IETF was driven by cultural imperatives rather than solely by technical requirements. In turn, a reliance on cultural imperatives explained the lack of uptake of the human rights work.

The dismissal of the human rights RFC was rooted in the belief that the approach of human rights advocates required a shift in the IETF's view of protocols as non-prescriptiveness. The majority of IETF engineers were unwilling to make this shift, for fear of how it would affect the Internet's overall technical functioning and the economic and cultural imperatives that undergird it. In the next section, I place these findings in the context of my literature review and make some concluding remarks about human rights advocacy as a co-optation of the Internet's infrastructure.

6. Conclusion

When discussing the nature of standards, IETF engineers highlighted connectivity, interoperability, permissionless innovation, and openness. Their articulation of these technical functions of the Internet's infrastructure were rooted in liberal notions of individual freedom, voluntarist connection, and choice. That is, they understood standards through protocol non-prescriptiveness, which ramped-up tensions between the human rights advocates and IETF engineers. Many IETF engineers saw the human rights advocates aims and goals as imposing requirements on standardization that contravened their culturally-situated set of beliefs about the nature of standards. These findings show how culture replicates power dynamics, highlighting the need for anthropological inquiry in the reflexive phase of Internet governance research.

The barrier of protocol non-prescriptiveness infuses ongoing discussions about human rights advocacy in the IETF (DeNardis 2014; Morris 2011; Mueller and Badiei 2018) with new insights. I argue that HRPC's work was shaped by how their advocacy efforts complimented and conflicted with the IETF's dominant understanding of standards. I do not, unlike other academics, consider these cultural barriers as insurmountable; I am not yet willing to write off human rights advocacy in the IETF as a "requiem for a dream" (Mueller and Badiei 2018). Rather, I think these findings call for further research on how human rights advocates can successfully introduce alternative norms into Internet governance organizations like the IETF.

My findings about the close connection between culture and code have implications for the infrastructural turn in Internet governance. The findings in this article suggest that isolating the "operational and administrative functions" (DeNardis 2012, 721) of Internet infrastructure is epistemically complex; it is difficult to disentangle technical functions from their social relationships and cultural context. This challenge raises questions for current theories on the turn to the

infrastructure. Primarily, it complicates how it can be known when a technical function constitutes a "primary Internet governance functions" (DeNardis 2012) rather than fulfilling a tacit social or cultural function. Such tacit social and cultural functions could perhaps be part of explicit primary functions.

These findings also inform debates about what can be known about Internet infrastructure co-optation and its impact on human rights. On its face, it can be argued that using protocol development in the IETF for human rights advocacy is a co-optation of the infrastructure. However, following the same epistemic line of reasoning set out above, demarcating certain uses of Internet governance as co-optation because they are outside of "primary technical and policy functions" assumes those functions are stable and fundamentally knowable, as opposed to culturally-contingent and socially-situated, as my findings suggest. The IETF has a long history of including social and political considerations in standard development (Braman 2011), as well as a documented track-record of long-term NGO participation (DeNardis 2013; Morris 2011). As such, it is difficult to sustain a distinction between primary and secondary functions, especially when considering how IETF participants are themselves embedded in broader ideological and economic structures of liberalism and market capitalism.

Building on my findings regarding the epistemic limitations of the turn to the infrastructure, I end by arguing that human rights advocacy—and other public interest efforts—within the IETF are not necessarily outside of its technical and policy functions. They can also be a novel iteration of an established IETF practice: structurally including social and political questions in standard development, this time including those related to human rights. This article does not discount the importance of the "turn to the infrastructure" or the insights it garners. Rather, it presents anthropological inquiry as a viable avenue for further refining these important insights into how code, culture, and choice come together to constitute Internet governance.

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