# Report:

## Future Paths to a Public Interest Internet Infrastructure

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# Introduction

This report is the result of an in-depth two-day discussion on "Future Paths to a Public Interest Internet Infrastructure" at a workshop of the same name. The meeting took place in the fall of 2019 at the Harvard Kennedy School, in Cambridge, Massachusetts. In this report we, like the workshop, do not aim to provide a definitive answer on how to build and maintain the Internet's infrastructure such that it engenders public interest values, including civil liberties, human rights, or social justice.

Rather, it gives an overview of the discussion and insights into where participants diverged and converged on their respective path(s) towards a public interest Internet infrastructure. This workshop is the first of what will hopefully be many more discussions on the topic.

The "Future Paths to a Public Interest Internet Infrastructure" workshop brought together 26 academics, activists, technologists, civil servants, and private sector representatives from 12 countries to discuss public interest advocacy at the lower layers of the Internet. The discussion took us from the very top of the stack – where our social media and search applications live – to its deep depths where sharks chew on our Internet cables.[1] We discussed expanding, collapsing, horizontally and vertically integrating the Internet's stack – and even doing away with the concept all together. Likewise, we discussed what it means to do public interest advocacy aimed at the Internet's infrastructure, what public interest entails as a concept, how different stakeholders can be effective advocates of it, and what it takes to study it.

These questions, the relevant technology, and the social movements aimed at better incorporating public interest into the Internet infrastructure will keep evolving and changing. This report should – as is good practice in academia, engineering, and activism alike – be seen as documentation of known issues and efforts at this current moment. It also provides a roadmap on how to further develop this conversation to include a broader range of stakeholders, network engaged scholars, and practitioners.

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[1] https://slate.com/technology/2014/08/shark-attacks-threaten-google-s-undersea-internet-cables-video.html

# Day I

## 'There is a crack in everything'

Day one was meant to, as the famous Leonard Cohen song goes, crack open the debate, to allow us to see where the light shines in on day two. Given the different backgrounds and sectors represented at the meeting, it was necessary and helpful to first lay out shared perspectives, articulate concerns, and find common ground. We started off with a tour-de-table, followed by a broad-based introduction to the intersection of human rights and Internet infrastructure.

### Tour-de-table

The tour-de-table highlighted that the participants shared views on:

- **The Internet:**
  is often conceptualized as a stack, with different layers that function independently. This conceptualization does not do justice to the current functioning of the Internet or to how the Internet operates in society. This term can obfuscate how technical and social processes are linked in their societal impacts. There is a need for more whole systems or full-stack approaches.

- **Civil society:**
  while its participation in Internet standardization and other lower-layer tech processes is limited because of financial resources and technical training, there is a real need to devise strategies to grow and sustain this participation in the face of the economic and social incentives working against it.

- **The endgame:**
  critical interrogation of the endgame should steer the Internet's infrastructure towards public interest values. The discussion should include cultural, technical, economic, and regulatory interventions – as well as a focus on developing new forms of cooperation among governments, civil society (including funders), academia, and the private sector.

### Session 1
*Human rights and Internet Infrastructure – an introduction*

The tour-de-table was followed by the session "Human rights and Internet infrastructure: an introduction" which included three talks, two by academics and one by a practitioner. The first speaker set the tone by quoting Leonard Cohen's song "First We Take Manhattan."

"They sentenced me to twenty years of boredom
 For trying to change the system from within"

The theme of the perceived dullness of human rights work in Internet governance and standard setting environments was juxtaposed by the subsequent two speakers, who drew urgency from the current political moment. The first spoke of the current political situation in the US and beyond. This speaker described what the increased swing to the right means in terms of the shrinking space for human rights and civil society both generally and with a particular focus on human rights and the Internet. The last speaker provided a comprehensive overview of the standards organizations in which her human rights NGO is active, how these bodies interacted and interrelated, why they applied different engagement strategies based on the nature of the organization (ranging from multilateral to multistakeholder), and what efficacy meant in the face of dealing with actors with both corporate and state budgets as well as teams.

As the Internet permeates all aspects of modern society, political changes complicate traditional civil society participation in the political processes of law and policy making. Due to the mushrooming of both venues and emerging technologies that have the potential for public interest impact, there is an urgent need for civil society to get further involved in technical discussions. This urgency tied together the distinct talks within session one.

The Q&A covered a broad set of topics, including the details surrounding the United Nations (UN) Group of Government Experts on Cybersecurity and the Open Ended Working group, specific barriers for civil society engagement in the Internet Engineering Task Force (IETF), and the impact of the lack of journalistic coverage of Internet standardization bodies. A shared take-away from the Q&A session was the need for civil society to develop their own plans. As one participant put it:

> "Politicians always have a plan ready in some drawer that they can dig up and dust off when the moment comes [...] Which makes me wonder: Where is our plan? Our vision? How do we move from being reactive on issues to being proactive? What is out plan that we want to put forward?"

This proactive approach to defining future paths set the tone for much of the sessions that followed, as the next paragraphs show.

## Session 2
### *A practitioner's perspective*

In session two, four practitioners shared the stage with an academic moderator to talk about their work as public interest advocates in distinct Internet standardization bodies. The participants' backgrounds ranged from the private sector to civil liberties NGOs – reflecting the

many non-traditional ways in which individuals can become engaged in civil society advocacy. Some technical topics that come up as directly relevant were:

- **Email encryption:**
  the IETF PGP (Pretty Good Privacy) Working Group, aimed at improving the PGP protocol for encrypting emails, did not succeed. Autocrypt, however, was able to provide user-friendly opportunistic encryption for email through cross-stack collaboration between protocol developer and implementers. This suggests that implementers of standards also need to become more actively involved in a.) the IETF and b.) the debates about public interest infrastructure – as they bring a much-needed perspective on these concerns, and they can help create alternative incentive structures.

- **Domain Name System (DNS) encryption:**
  The DNS is one of the few remaining unencrypted protocols. In the debate ongoing within the IETF about how to best to encrypt it, argument and conversations boil down to which actors we trust to perform this encryption, what effects the choice will have for centralization of control within a limited number of companies, how hard it should be to block content, and by whom. The encryption of DNS also leaves less opportunities for research, as captured in the aphorism: "we cannot have all of the current DNS and encrypt it too."

Two non-protocol topics that came up were:

- The need for strong regulation, in addition to or as supportive of, human rights work within standardization, especially as vendors and other transnational corporations are used to "forumshop," push bad technical proposals, or circumvent regulation by technical means. Further, movements of market consolidations should be tied into the local regulatory environment, perhaps under a frame of "economic justice."

- The need to include more socially-minded engineers, and non-technical people, in public interest technology work. This inclusion would require more active outreach as well as creative thinking about how such work could fit within the remit of engineers working for the private sector.

The Q&A focused on the thorny questions human rights activists face in their day-to-day deliberations: how and when should activists team up with the private sector, bridge ideological differences within civil society, strategically invoke concepts like "the stack" or the politics of protocols, and translate lessons-learned in standardization bodies to other civil society debates about Artificial Intelligence (AI) or other (re)emerging technologies? While there was no unified answer to any of these questions, the debate started a list of both the volume of unresolved questions civil society faces as well as their rich toolset for approaching these issues within the context of Internet standardization.

## Session 3
### *An academic perspective*

In session three, an activist moderated a panel of four academics. This discussion identified areas of shared interest and teased out where academic knowledge could contribute to practice. The academics jointly highlighted three issues:

- A limited number of civil society actors are actively engaged in the lower layers of the Internet, and there is limited knowledge about their efficacy. The preliminary findings presented suggest that this group is effective in moving the needle on technical discussion

but face cultural barriers as well as lack of regulatory support for their agendas.

- Academics provide a good perspective on how rapidly the Internet's technology and how it is seen by and used in society ("socio-technical Internet imaginaries") change. Academics also bring their perspectives on how, why, and when to push back on "fads" in terms of technology (such as AI). Ethics and pushback can be used as a means to reign in these fads. We need to think critically how feminist care and decolonial approaches might be used to articulate a new set of frames for articulating how to mitigate tech impact.

- Academia itself can serve in three different ways: it can further research, provide knowledge paths to students, and increase the credibility of a field of work. It would be interesting to explore each of those in terms of the agenda of this conference. Likewise, it would be relevant to consider whether we should set up a conference similar to the Fairness, Accountability, and Transparency in Machine Learning ACM conference (FAT*) but for infrastructure and values.



The Q&A brought out tensions between the civil society and academic approaches to the issue at hand. This divide was most pronounced in discussions around the framing of the problem (aka "the materiality confusion"). This initial confusion led to a fruitful conversation about the importance of framing and science communication. All four scholars remarked that they struggled and needed to "code-switch," like the activists, to get attention for their work when framed as infrastructure. It seemed especially hard to interest networking engineers into societal impact issues, because they regard their works a "machine-to-machine" (M2M): this view underlines the importance of attention to this issue in computer science classes.

Related, the question of the usefulness of human rights as a frame for discussing public interest issues came up. Its usefulness often depended on the larger contextual environment in which it was invoked. In practice, human rights often stood in for political rights (such as privacy and freedom of expression) sometimes at the expense of social, cultural, and economic rights (such as anti-discrimination). Participants questioned what it could look like to teach "the public interest" to students. Some suggestions were integrated impact modules for each computer science course or even each chapter of computer science textbooks, certification programs, and/or teaching students about the political and economic drivers of tech development.

## Session 4
### *Identifying commonalities and differences in perspectives towards the formulation of Future Paths*

The final session, chaired by a practitioner, brought together a civil servant, a private sector participant, and an academic. They summarized the day, focusing on where perspectives on the path forward overlapped and diverged. The following commonalities, differences, and concrete to-dos were identified in the various discussions.

**Commonalities:**

- Internet infrastructures are seen as important loci of societal change and a relevant object of study and engagement for academics and activists alike.
- There is a need to look for new ways to communicate the relevance of the work to different audiences and stakeholders.
- Students could be seen as a body of potential public interests' representatives.

**Differences:**

- There are different understandings of what the public interest entails.
- Priorities for what the end-game is (regulatory, technical, cultural, mix, etc.) can differ.
- Strategies for advocacy can vary: collaboration versus contention, offering versus asking, etc.

**Concrete to-dos:**

- Ensure better (science) communication
- Have more journalistic coverage of public interest impact of infrastructure
- Identify new models for working across stakeholder groups ('global south' governments, civil society, small and medium sized enterprises)
- Envision increased, long term funding opportunities for civil society actors working on public interest infrastructure
- Model for comprehensive inclusion of users and marginalized stakeholders from the 'global south'
- Strive for a continued creation of spaces for these various stakeholders to network outside of the Internet standardization bodies

# Day II

## 'That's where the light gets in'

### Session 1
### *Combining perspectives*

Day two of the workshop focused on delving deep into the most urgent issues identified on the first day. With this purpose, the morning opened with a panel discussion featuring two civil society actors and two academics, chaired by a third academic. They identified a total of nine topics that warranted further in-depth discussion:

- Form coalitions across stakeholder groups
- Form concentric circles to understand what issues are going on in which body
- Ensure long-term civil society participation, with multiple competencies, in governance and standardization processes
- Connect public interest work with issues of consolidation and antitrust
- Improve the understanding of which framework to use when engaging in public interest technology: social justice, human rights, freedom, democracy, bottom-up engagement, etc.
- Increase the amount of implementers of public interest technology in standards setting bodies
- Create the ideal-type public interest Internet we want to achieve: what would this entail? What does "the-plan-in-the-drawer" seek to achieve?
- Establish an academic convening, similar to FAT*, to get more attention and credibility
- Provide students with educational resources allowing them to gather knowledge about public interest technology issues

### Session 2
### *Break-out sessions*

Reflecting on the discussions held during the workshop up to this point, participants were invited to propose small-group sessions to examine specific emerging topics in further detail.

The self-formed break-out groups that came together were: Long term participation, Consortiums across stakeholder groups, Ecosystem mapping, Academic support, and Media, communications and journalism.

After the discussions took place, a participant from each group summarized the key highlights. We reported them here as they were succinctly communicated at the workshop.

## Long term participation

- The IETF and other Standards Developing Organizations (SDOs) have a very guild-like structure. Participants who have been contributing for many years (often decades) to their workings would be greatly positioned to welcome newer participants and support collaboration opportunities among new and established contributors.

- Long term fellowship programs designed to strengthen the participation of civil society actors in SDOs (ideally supported by experienced mentors) would be more beneficial than short-term fellowship initiatives.

- Private-sector actors who do public interest work at IETF in addition to their daily jobs should be able to receive support in order to keep their efforts sustainable over time.

- As long term engagement in Internet infrastructure fora is critical for civil society actors, the donors who support their work should model their funding programs accordingly, including long-term funding opportunities alongside short- and medium-term ones.

- Financial support is important to strengthen the work of civil society organizations and public interest technologists, but it is not sufficient. An entire support ecosystem should be envisioned and bolstered to leverage the work on public interest advocates across the board.

- Academic institutions might represent a critical venue for long term capacity building and cross-domain engagement.

## Consortiums across stakeholder groups

- How can stakeholders who are not yet involved in existing cross-domain discussions (e.g. small to medium sized corporations and 'global south' governments) become engaged in them?

- How can small, like-minded companies, such as Internet Service Providers (ISP) or Hosting Providers, become engaged, and how can they be supported in getting their concerns heard in SDO debates - without taxing them with additional work that they would not be able to sustain due to their limited resources?

- How can relevant stakeholders whose work is affected by the decisions taken by SDOs, but who are not participating in the IETF and similar fora, become engaged?

- How can it be ensured that user concerns are represented in Internet standardization and other relevant infrastructure bodies?

- Overall, can the concerns of underrepresented communities be represented without making it necessary for them to physically attend decision-making convenings?

- Opportunities that could be considered moving forward:
  - Support the creation of gatherings for smaller infrastructure providers to connect and discuss common issues, perhaps also identifying public interest advocates among them who could represent their concerns within the IETF
  - Create funding opportunities aimed at financing the management and coordination of such gatherings and initiatives, including support for the representatives who would participate in the relevant Internet infrastructure bodies

## Ecosystem mapping

- Develop an ongoing effort to map stakeholder interests and participation in Internet infrastructure organizations, focusing on institutional and demographic inclusion to identify who is represented, not represented, and who is affecting decision-making processes.

- Other aspects that might be interesting to research are corporate competition, geopolitical rivalry, and civil societies representing different public interests. Such effort would take a mixed-methods approach, including surveys and interviews of participants, as well as both qualitative and quantitative analysis of institutional records.

- Outputs of this research will show the historical and contemporary politics driving outcomes in these organizations, and identify possible points of intervention through advocacy, coalition-building, and/or technical design.

## Academic support

- Increasing the interest in the impacts of infrastructure technology through workshops in relevant conferences such as SIGCOMM (Association for Computing Machinery's Special Interest Group on Data Communications conference) and TPRC (Research Conference on Communications, Information and Internet Policy)

- Raise awareness about the impacts of lower layer technologies in Computer Science Introduction classes

- Increase legitimacy of scholarly research on the impacts of infrastructure technology through formal certification (e.g. Massive Open Online Courses (MOOC))
- Support further research in the field through fellowship programs (see COMPASS (consortium on media policy studies) fellowship program)
- Institute awards for technologists whose work supports public interest Internet infrastructure and architecture
- Influence funding programs (e.g. National Science Foundation) to support research in this field
- Encourage relevant associations to support work focusing on public interest infrastructure technologies (e.g. ACM US Technology Policy Committee, or the Computing Research Association which will soon hold a meeting on Artificial Intelligence and ethics)

## Media, communications, journalism

- Produce briefings and resources designed to inform donors of the most relevant issues regarding Internet infrastructure technologies and their impact on the public interest
- Create resources aimed at explaining in clear terms how Internet protocol development can have direct consequences on the human rights of users, and what could it mean to develop a human rights-enabling infrastructure
- Seek opportunities to engage technology journalists and provide them with the information and contacts to cover stories occurring in the Internet infrastructure and public interest realm that have the potential to attract the attention of mainstream media outlets
- If funding allows:
  - Sponsor journalism fellows (young professionals as well as experienced technology journalists) to attend SDOs meetings and cover relevant stories
  - Train tech journalists on two-day workshops (with or without the support of an institution) designed to build their capacity to cover this type of work and subsequently support their participation in relevant meetings
  - Bring editors – who could otherwise act as gatekeepers – into the process and capacity building programs
  - Ensure that neutral organizations can host fellows, not to incur in conflicts of interest
  - Engage accredited undergraduate journalism programs
- Connect with relevant publications where academics who are working on these topics can start publishing pieces 1500-5000 words, thus paving the way for future academics (e.g. special issues of academic journals, media outlets such as The Conversation, Logic magazine, or Ars Technica)
- Identify global publications distributed and translated also in non-English speaking contexts
- Support scholars and public interest technologists to attend events and research conferences (such as those organized by the Institute of Electrical and Electronics Engineers (IEEE) and the Association for Computing Machinery (ACM))
- Provide financial support to open access publishing
- Organize dedicated convenings before or after relevant journalism conferences

## Next Steps

A few short- to medium-term next steps were identified and communicated as the workshop concluded:

- A workshop report
- A call for abstracts for the production of a special issue of a peer-reviewed international academic journal based on the workshop proceedings
- A call for feedback inviting participants to answer a few questions regarding the usefulness of a follow-up workshop, the focus of such event, potential invitees, possible location and interest in co-hosting

## Conclusions

The Internet infrastructure works by enabling information to flow down and up the stack through interconnected networks. Likewise, facilitating interconnection between the private sector, academia, and civil society is crucial in defining future paths for a public interest-respecting Internet. This workshop was a microcosmos of what successful collaboration across sectors can offer in terms of building and maintaining an open and accessible interconnection. The conversation helped identify obstacles and paths that have not been travelled yet and to uphold the public interest with Internet standards development - and Internet governance generally. The workshop stressed the urgency of further developing dedicated spaces for cross-stack, cross-sectoral, and frank conversation about the Internet's future and the incentive structures driving it.

This workshop constituted a small step towards such conversations. It helped to connect its participants based on their shared concerns and visions, while also inviting them to develop concrete technical, business, media, and legal interventions that spur new imaginaries and incentive structures, and further the distribution of wealth, power and possibilities. All of this with the vision that whatever paths lie ahead of us, we will be able to contribute to make the Internet welcoming, inclusive, accessible, adaptable, and relevant for everyone.

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