Digital Infrastructure in Times of Crisis

OPINION

Times of crisis, like the current pandemic, lay bare the vulnerabilities created by civil society's dependence on the Internet. What does the future hold?

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COVID-19 and other crises show us how important our infrastructure is. Right now, this means digital infrastructure. The current epidemic has brought the Internet and our entire digital infrastructure to the forefront. We use our physical devices to connect virtually to our loved ones, our doctors, our teachers and students, our co-workers, the government, and supply chain resources necessary for sustenance. Almost overnight, we became more dependent on Zoom, Facebook, Microsoft (Skype, Teams), Google (Gmail, GSuite), Apple and many more applications running on the infrastructure than ever before.

The epidemic is, however, painfully reminding us of limitations or even critical failures of this infrastructure. It reminds us of the existing **digital divide** and its consequences. Imagine, for example, a laid off single mom in a rural area, who has a phone instead of a computer, but no reliable mobile Internet access, and the state requires unemployment claims to be filed online. And to make it worse, the physical places that people go to gain Internet access (cafes, libraries, even the Apple store) are shut down.

According to the latest **FCC Broadband Deployment Report**, released on April 24, 2020, rural and tribal areas lag significantly behind urban areas when it comes to mobile broadband deployment: "22.3% of Americans in rural areas and 27.7% of Americans in Tribal lands lack coverage from fixed terrestrial 25/3 Mbps broadband, as compared to only 1.5% of Americans in urban areas." According to the **2018 Broadband Deployment Report**, more than 24 million Americans in cities lacked fixed terrestrial broadband at speed of 25 Mbps/3 Mbps. While the FCC is now reporting rapid progress for urban areas, there are **proliferating critiques** against the latest figures that might curb early enthusiasm.

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There have been some efforts to serve those with urgent access needs, as for example young populations needing to access school sessions; **some are coordinated efforts** of nonprofits, governments, and ISPs. The digital divide is also not new—it is an **old and global challenge** perhaps **heightened with ever-increasing technological advancements**. The epidemic however reveals the need to continually assess and re-assess criticality and examine how we should treat critical digital infrastructure from a regulatory perspective to ensure, first of all, its very **existence**. Subsequent, and equally important, is the need to ensure both **capacity** and **maintenance** of the infrastructure as well as universal, equal or equitable **access** to it.

This digital infrastructure is composed of **technical components** (hardware, software, content) but its purpose is to connect people and serve communities. Besides hardware, software, and content, the Internet was formed by and for (human) **communities**. In their piece documenting the **history of the Internet**, Barry Leiner, Vinton Cerf, David Clark, Robert Kahn, Leonard Kleinrock, Daniel Lynch, Jon Postel, Larry Roberts, and Stephen Wolff underscored the importance of the human factor:

> **The Internet is as much a collection of communities as a collection of technologies**, and its success is largely attributable to both **satisfying basic community needs** as well as utilizing the community in an effective way to push the infrastructure forward. [emphasis added]

The builders of our information superhighway remind us that the Internet was built by collaborating communities of scientists to serve community needs.

This **infrastructure** is meant to serve human and community needs, facilitate communication and all the everyday services that this communication can support. **Yet, the reality is that still today not all communities have meaningful access to this infrastructure, and, therefore, they also don't get to participate in its development, let alone in policy discussions about access and regulation.** The striking impacts of the digital divide, the split in Internet "haves" and "have nots", is highlighted consistently by civil society organizations working with communities on the ground; for example, the **Greenlining Institute** in Oakland, CA, has demonstrated how the digital divide is disproportionately impacting communities from historically disadvantaged backgrounds. The current pandemic has also intensified the need to close the digital divide gap as **Human Rights Watch**, among many others has been calling for, and has also highlighted the need to support community networks, as the **Alliance for Affordable Internet** recently pointed out.

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From a regulatory perspective, it is unclear whether parts of our digital infrastructure, or the infrastructure as a whole, are considered critical or an essential service. Even people outside of the regulatory realm are now familiar with this term, popularized by the current coronavirus crisis. Hospitals, pharmacies, grocery stores, public transportation, gas stations, utilities, government services (courts, jails, police stations), banks, newspapers, television, and radio are all examples of services that have been recognized as essential by various State and local governments during the coronavirus lock-down measures. The communications sector is identified as critical infrastructure and defined as essential during the COVID-19 restrictions. Is our information superhighway and the broader digital infrastructure among them critical? To state this in more narrow and concrete terms: which parts of this infrastructure might be so critical that they deserve further attention? We are in a time when access is urgent. Lacking access to the infrastructure threatens vital needs, security, public health and safety. Moreover, if digital infrastructure is critical, how is it currently being regulated, and what needs to change?

The logical next question is to ask what is considered as critical infrastructure and identify possible gaps left by current regulatory approaches to critical infrastructure. Furthermore, what are the regulatory implications of recognizing the criticality of a network like the Internet? **Do our current regulatory approaches to criticality include *meaningful access* to the network during public safety or security crises?** To take a more specific example, is the lack of broadband in certain areas consistent with the regulatory definition of criticality that we examine below?

The **Critical Infrastructure Protection Act of 2001** uses the term critical infrastructure "for systems and assets, whether physical or virtual, so vital to the United States that the incapacity or destruction of such systems and assets would have a debilitating impact on national security, national economic security, national public health or safety, or any combination of those matters" (Section 5). Or, as John Oliver stated in his March 1, 2015 Last Week Tonight **episode** dedicated to the "non-sexy" topic of infrastructure, "It's our roads, bridges, dams, levies, airports, power grids…basically anything that can be destroyed in an action movie."

Looking at the Critical Infrastructure Protection Act's definition, at least two of the boxes of the Act are ticked, especially when we look at the current circumstances of a health crisis. The incapacity or destruction of our digital systems and assets would have a debilitating impact on national public health or safety, and national economic security. This conclusion is based on two assumptions: people would not be able to shelter-in-place without the constant flow of online information and without robust digitally mediated communication being possible. And much economic activity—our work—can continue in some form or another online. Neither of these assumptions are uncontested, but one cannot easily bypass the question: In 2020, isn't the Internet itself critical infrastructure? Or is the critical infrastructure definition we read above insufficient to capture the Internet?

Viewing our digital infrastructure as critical will determine a number of important policy issues. Among them is the question of ensuring network access to all members of society in an equal or equitable way. In addition, we must assess whether our laws and regulations are incentivizing and funding infrastructure maintenance. Relevant here are the already prominent **net neutrality debates linking to public safety concerns**, as well as antitrust laws in general. Our answers to the policy questions will determine public and private **investments in the integrity, safety, and security of the network**. (In this case, "security" includes but is not limited to **cybersecurity**.)

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During the shelter-in-place ordinances that proliferate around the country and the globe, we rely on the Internet and on digital technologies for receiving and sharing reliable information, communicating with loved ones, working with our colleagues, consulting healthcare professionals, and procuring medicine and basic supplies. One cannot help but think about the vitality of the network that supports these activities. The network is physical (hardware), virtual (software and digital content), and also human (powered by humans). While this post is focused on digital infrastructure, let's not neglect the very physical and mostly invisible labor behind the networks: from the reporters behind cameras, keyboards, and editing software, to the emergency responders in hotlines, to the IT specialists maintaining and expanding our bandwidth capacities. This invisible labor might be heightened in times of crisis but is far from new. In 2015, for example, **Christopher Mims** was writing about how people are the 'new infrastructure' in the labor-force and how the—then new—gig economy reveals infrastructure that already exists.

What does the future hold? What would a widely accessible robust digital infrastructure look like? What dangers lie ahead if this is not achieved?

If we focus on who defines criticality, and specifically in democratic processes or governments, the inequities explored above force us to rethink participatory decision-making about digital infrastructure. Ensuring that not only government and market stakeholders take part in such decisions is important. Bottom-up participatory decision-making from civil society members might be more urgent than ever, for two reasons. First, to ensure that the decision-making ultimately in the hands of regulators reflects real societal needs and does not neglect a plethora of vulnerable or minority community members and their access to critical infrastructure. State and market actors might tend to overlook participation as a factor critical to infrastructure design and maintenance, and also availability and access. In this respect civil society can mitigate purely cost-efficient approaches to criticality from the public sector, or purely profit-centric market-driven approaches to criticality from the private sector. The second reason is civil society's dependencies on digital systems. **As Lucy Bernholz notes**, **civil society is dependent on digital systems, which are "not neutral, designed with civil society in mind, or innately democratizing."** Times of crisis, like the current pandemic, lay bare the **vulnerabilities** created by civil society's dependence on the Internet.

Defining what is and what is not critical matters especially in time of crisis when humans and their material resources are both under stress. It might be wiser to think of criticality in advance of this stress or, at least, take the opportunity from the current crisis to re-think priorities and avoid or mitigate future ones.

If digital infrastructure is the backbone of functioning markets, and—now—civil society and democratization, then why don't we do more to protect and develop it?

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COVID-19, DIGITAL INFRASTRUCTURE, DIGITAL POLICY