Images of the Internet: Protecting the Integrity of the Web

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As the Internet is increasingly expanding and evolving, the question of what the Web looks like and who has control over it comes into play. For a technospatial realm originally molded after the horizontal, free-thinking example of California culture, the integrity of the Web exists on the foundation that it is innately a borderless, free network. The fluctuating presence of the web, the technologies and policies behind its use exacerbate tensions between various images and competing identities that compose the layers of the Internet's utility. The Internet is an open realm, yet has a very tangible physicality which is regulated and monitored by competing entities. How does the issue of regulation and net-neutrality bring to light the elusive boundaries and images of the web? While the Internet cannot remain completely unregulated, a gentle balance between protecting privacy and utility and maintaining that space must be established regarding privacy and Net Neutrality.

There are many images of the Web that are understood or widely known. The web is commonly seen as a borderless, expanding network. It used to be understood through the metaphor that the Internet is a 'place.' This metaphor still influences Internet governance, and originated in the early days of the Net when it did genuinely feel separate from the real world.[1] This space was maintained and conducted with a democratic mindset, allowing the freedom of speech and expression to all people. As the span and scope of the Internet continues to grow and transform, it is important to separate and consider the Internet and the multiplicity of its structure. Before it is possible to approach how the Internet can be regulated or influenced, one must understand the various "layers" of Internet topology and how each layer is susceptible to regulatory pressure. The Internet can be separated and categorized into three layers: the physical layer, the logical layer and the content layer.[2] The content layer is composed of the information and statements that individuals perceive or receive from the Internet. This is largely composed of intellectual property, where the discussions of private enforcement deal with issues of copyright. The government has strengthened laws to narrow the permitted uses of content, and increased the penalization for infringement. The logical layer describes the algorithms, data paths and

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[1] Goldsmith, Jack L. "Who Controls the Internet?: Illusions of a Borderless World." *Oxford University Press,* pp. 1-59. http://site.ebrary.com/id/10160558?ppg=72, 16.

[2] Ganley, Paul and Ben Allgrove. "Net Neutrality: A Users Guide." *Computer Law & Security Report 22* (2006) pp. 455-456.

standards "including TCP/IP, HTTP and HTML – that allow content layer materials to be understood and transmitted in machine readable form; it is one part of the 'machinery' of the Internet."[3] The battles between technologies, which underlie the Internet, the controversy is between peer-to-peer software providers on the implementation of anti-circumvention laws to ensure the domain name system functions effectively. The third faction of Internet is the physical layer. This is composed of the tangible objects – computers, wireless devices wires, routers etc. – that physically connect computers to each other and to the Internet.[4] The physical layer must interpret the regulation of hardware, computers and other devices that process content.[5] Since an increasingly dominant online social presence is coupled with a shift toward Internet-dependent industry, the images of the web have to be understood in a more comprehensive and realistic way other than its "borderlessness." Instead, the domain of the Internet is so large and powerful that it does in fact take up real, physical space that requires significant care to maintain. Big data storage can compose a million square feet, and then need to be sourced with power and cooling equipment.[6] In this domain, the image of the Internet can be portrayed and seen as a public utility—it functions as a road, or a water pipeline would; maintained with the service in mind. "Today, the broadband wires and networks on which the Internet relies are the modern-day equivalent of these phone lines, and they should be regulated as such: like telephone companies before them, ISPs should be considered common carriers. This classification is crucial to protecting the Internet as public infrastructure that users can access equally, whether they run a multinational corporation or write a political blog."[7] With a more dynamic understanding of what the Internet looks like, a better sense of its utility is achieved.

With such complex images of what the Internet looks like, it is important to decipher who controls these entities. It is no surprise that this control began with the engineers—those that conceived and implemented the idea of the Internet. The engineers' method of governance was unlike territorial governance at the time; for them, difficult decisions were not imposed by force from the top to the bottom, but rather an organically formed 'bottom-up' fashion through

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[3] Ibid.

[4] Ibid.

[5] Ibid.

[6] Hogan, Mél and Tamara Shepherd. "Information Ownership and Materiality in an Age of Big Data Surveillance" *Journal of Information Policy,* Vol. 5 (2015), pp. 9-10.

[7] Ammori, Marvin. "The Case for Net Neutrality." *Foreign Affairs,* July/August 2014 Issue. pp. 3.

discussion, argument, and consensus.[8] So when the post-territorial visionaries looked for a model of Internet governance, they looked at the engineers for inspiration. However, it was no surprise that the community that invented the Internet would lose control over it after its creation. As Internet Service Providers (ISPs) increasingly commercialized the web and began to reap the profits of the industry, their involvement and control shifted (See Appendix 1). "Historically, ISPs have acted as gateways to all the wonderful (or not so wonderful) things connected to the Internet. But they have not acted as gatekeepers, determining which files and servers should load better or worse. From day one, the Internet was a public square, and the providers merely connected everyone, rather than regulating who spoke with whom."[9] Instead, this historical standpoint did not hold as different ISPs began to compete and regulate what they considered their own. ISPs further drove the trend toward securitization because that as private sector actors, who bear the brunt (and costs) of defending and maintaining cyberspace's critical infrastructures, they are increasingly looking to their own governments to carry this burden as a public good.[10] With the Internet's ubiquitous nature, and the real territorial issues that transcend the technospatial environment of the web, it is not surprising that this governance would be supplemented and replaced by global governmental institutions.[11] The Federal Communications Commission (FCC) acts to engage and set rules and standards regarding the Internet. "In 2010, the FCC adopted a set of net neutrality rules known as the Open Internet Order, which barred providers from blocking or giving preferential access to particular websites and applications and required more disclosure about their policies."[12] The FCC effectively prohibited ISPs from creating and charging for fast lanes, but left significant loopholes. Mobile access was exempted from the order, even though more people now go online through their cell phones that through their home computers. ISPs were also made able to violate net neutrality through connection deals that they make directly with websites – a loophole that Comcast and others have exploited.[13] As the FCC experiments with its new and pervasive power among the control of the

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[8] Goldsmith, Jack L. "Who Controls the Internet?: Illusions of a Borderless World." 24.
[9] Ammori, Marvin. "The Case for Net Neutrality." 4.
[10] Deibert, Ronald and Rafal Rohozinski, "Liberation vs. Control: The Future of Cyberspace."
        Journal of Democracy, Volume 21, Number 4, Oct. 2010, pp. 50.
[11] Goldsmith, Jack L. "Who Controls the Internet?: Illusions of a Borderless World." 25.
[12] Ammori, Marvin. "The Case for Net Neutrality." 9-10.
[13] Ibid.

Internet, switches between leadership, and witnesses the technological advancement of the time, it has learned and adapted to its own policies.

These entities that control the web transcend into the public sphere, influencing how information is collected and stored—whether it be with regards to big data, surveillance or privacy, these governmental bodies and powerful ISPs are able to collect and retain massive amounts of sensitive information of large datasets of people. "This industry services, promotes demand, and supplies pools of information with highly focused products and markets. By scouring the electronic environment for records of personal information, these companies add value to them in various ways, sometimes simply aggregating and packaging them for easy access and retrieval, and other times analyzing or mining them for offerings they believe to be valuable for potential customers."[14] The question arises whether or not this fundamentally breaches the privacy of Internet users with unacceptable forms of surveillance and data gathering. Even the U.S. government is a main proponent in collecting data. For example, take when the U.S. Department of Justice (DOJ) issued a subpoena to Google for one week's worth of search query records, absent identifying information, and a random list of 1 million Uniform Resource Locators (URLs) from its Web index in 2006. When Google refused the request, the DOJ filed a motion in a federal district court to force compliance. Google argued in court that the request imposed a burden and would compromise trade secrets, undermine customers' trust in Google and have chilling effect on search activities.[15] As each entity of power asserts control over the Internet and extracts data over the constituents of the Web at their free will, the struggle over freedom of speech, access to information, privacy protections, and other human-rights issues are reflecting the current uncertainty in regulation and policy.[16] These privacy rights need to be addressed, specifically because the data is then used against the user without prior knowledge or consent for targeting.

This regulation and information channeling is already a normality in search biasing. Considering the gatekeepers of the modern Internet ecosystem save personal data on users based on previous search history. With this information search engines can personalize search results even more, based on personal preferences, social affiliation and browsing history. If two people

[14] Nissenbaum, Helen. *Privacy in Context.* Technology, Policy, and the Integrity of Social Life. Stanford University Press: 2010. Print. 49.
[15] Nissenbaum, Helen. *Privacy in Context.* 29-30
[16] Nissenbaum, Helen. *Privacy in Context.* 55.

search the same exact thing in a search engine, it is actually very unlikely that they will be presented with the same results. Instead, the search engine has accumulated a user profile on this person and will tailor the results to this profile. Some scholars have considered this the first step that could spiral towards the normalization of information channeling alterations. In this context, Krämera highlights eight principles that should be enacted for search neutrality: "(1) Equality: Search engines should not differentiate between websites. (2) Objectivity: There are correct search results and incorrect ones, so search engines should return only the correct ones. (3) Bias: Search engines should not distort the information landscape. (4) Traffic: Websites that depend on a flow of visitors should not be cut off by search engines. (5) Relevance: Search engines should maximize users' satisfaction with search results. (6) Self-interest: Search engines should not trade on their own account. (7) Transparency: Search engines should disclose the algorithms they use to rank web pages. (8) Manipulation: Search engines should rank sites only according to general rules, rather than promoting and demoting sites on an individual basis."[17] Given these parameters to ensure a fair search engine, regulators must consider how search biasing inhibits privacy and right to information. Instead of being the open "Public Square" that the Internet used to be, certain users are directed and channeled towards arbitrary information without choice or consent.

How data is manipulated and presented is a prominent concern, especially regarding the current power dynamic between ISPs, the U.S. government and the users of the Internet. As technology advances, regulation and information segregation becomes easier and more commonplace. The router allows operators to prioritize or de-prioritize certain packets of data or even drop or remove them from their network altogether. This technology continues to evolve and allow operators to choose how to handle data packets for commercial or policy reasons as opposed to the network performance reasons. Packets can be favored because they originate from a preferred source or de-prioritized or even blocked simply because they originate from a non-preferred source. This prioritization or de-prioritization of data packets is often dubbed "access tiering" and it is at the core of the Net Neutrality debate.[18] The ability to handle data on different network tiers has ignited a high-profile debate in the United States about whether or not

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[17] Krämera, Jan and Lukas Wiewiorraa and Christof Weinhardta. "Net neutrality: A progress report." *Karlsruhe Institute of Technology, Institute of Information Systems and Management*, Englerstr. 14, 76131 Karlsruhe, Germany. September 25, 2012, pp. 32.
[18] Ganley, Paul and Ben Allgrove. "Net Neutrality: A Users Guide." 454.

operators should be allowed to discriminate between data packets and, therefore, whether regulatory intervention is needed to constrain how operators run their networks.[19] Without regulation this opens the door for ISPs to differentiate the data pathways, allowing only some information through at their own discretion. That means an ISP could charge more to stream Netflix versus YouTube, or increase or slow a users browser speed based on price or data plan. This could create a complicated network of business alliances, restrictions on information and socioeconomic disparities. After pushback from the American people, the FCC reconstructed the Open Internet rules and adopted new rules on February 26th, 2015. These rules were designed to protect free expression and innovation on the Internet and promote investment in the nation's broadband networks. The new rules apply to both fixed and mobile broadband services, recognizing advances in technology and the growing significance of mobile broadband Internet access in recent years. These rules restrict blocking so broadband providers may not block access to legal content, applications and services. It also restricts throttling; broadband providers may not impair or degrade lawful Internet traffic on the basis of content, applications, or services. Further, it restricts paid prioritization or "fast lanes"; broadband providers may not favor some lawful Internet traffic over other lawful traffic in exchange for consideration of any kind.[20] Even though actions have been taken, the concept of Net Neutrality and its place in our society is not resolved.

There are many difficulties regarding the Internet that instantiate the arguments for each side of the Net Neutrality argument. Those that are against Net Neutrality are mainly the operators of the systems. In the US, the most vocal of these have been companies like AT&T, Verizon and Comcast. The operators argue that the increasing demands placed on the modern Internet require a level of investment that can and will only occur if the Internet is efficiently commercialized. They insist that the implementation of the "user pays" model is necessary for the use of their networks and, hence, the Internet; those who make high use of and profit from the Internet, should, the operators say, pay for that use.[21] There is also the concern that a heavily regulated Internet would kill the inventive to develop new products and innovate current technologies. The argument against Net Neutrality is also a debate about engineering capacities.

[19] Ganley, Paul and Ben Allgrove. "Net Neutrality: A Users Guide." 455.
[20] Open Internet. *Federal Communcations Commission.* May 2, 2015. FCC.gov.
[21] Ganley, Paul and Ben Allgrove. "Net Neutrality: A Users Guide." 455.

There is always a constant need for more bandwidth; as bandwidth increases, communication becomes almost instantaneous. "Bandwidth limitations illustrate an important but poorly understood fact: the efficacy of Internet communications depends on the real-space location of both data and the underlying Internet hardware through which the data travel (routers and exchange points, and the fiber-optic cables, phone lines, cable lines, and microwave and satellites transmitters and receptors that interconnect them)."[22] Operators have proposed that a tiered Internet – fast, slow and any other iterations of speeds in-between – will improve network efficiency. The more regimented and managed it is, the greater the efficiency of traffic handling would be.[23] Without regulating these conditions and adjusting to tradeoffs, the applications either sap bandwidth or demand high levels of service quality, which places extra burdens on the infrastructure built and maintained by the operators.[24] These engineering tasks and operation infrastructure must be addressed to be able to move forward.

Regardless of the difficulties presented by upholding the Internet to such a high standard, there is a pressing need to enforce Net Neutrality. The Internet constitutes a unique medium, where cyberspace does not exist on a geographical location to anyone, but instead is made with the intention to represent a democratic, unregulated system. The Web was intended to be open for all to add to it and change it, without Net Neutrality, this freedom would be blocked. Companies such as Comcast have already exercised loopholes to the Net Neutrality rules, expressing the abuse of power and polarization of the Web. "The message that these groups and individuals send out is that access tiering threatens the core values and social utility of the Internet and that governments must intervene to prevent access tiering from occurring."[25] Considering the Internet as a public utility underlines the need to ensure equal access and opportunity for all people who access it, regardless of provider or data plan. "In some ways, the Internet is just the latest and perhaps most impressive of what economists call 'general-purpose technologies,' from the steam engine to the electricity grid, all of which, since their inception, have had a massively disproportionate impact on innovation ad economic growth. In a 2012 report, the Boston Consulting Group found that the Internet economy accounted for 4.1 percent (about $2.3 trillion) of GDP in the G-20 countries in 2010. If the Internet were a national

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[22] Goldsmith, Jack L. "Who Controls the Internet?: Illusions of a Borderless World." 54.
[23] Ganley, Paul and Ben Allgrove. "Net Neutrality: A Users Guide." 461.
[24] Ibid.
[25] Ibid.

economy, the report noted, it would be among the five largest in the world, ahead of Germany."[26] Allowing ISPs to regulate and solicit profit from certain data paths would nearly eliminate those creating small businesses, those expressing minority opinions, and those attempting to tap into the Internet economy through online employment. Allowing ISPs to regulate the data that comes through to a user in essence takes away the most fundamental basis for the Internet—to have an even platform to express ideas and expand upon. Instead, there would be no difference between the terrestrial government and the Internet; only the powerful would be able to speak, and the powerless will become speechless.

Moving forward with policy, it is important to understand that there must be *some* regulation of the Internet, and that there is already regulation on the Internet, as it exists today. The question is not whether to regulate cyberspace, but how to do so—within which forum, focusing on which layer, involving which actors, and according to which of many competing values. The regulation of cyberspace tends to take place behind the scenes, based on decisions taken by private actors rather than as a result of public deliberation, without even the knowledge of the public. As the trend toward the securitization and privatization of cyberspace continues, these problems are likely to become more, rather than less, acute.[27] The Net Neutrality rules that are put in place by the FCC are important and must be maintained and improved as the topography of the Internet continues to change. Open access to all content through an open channel is important regardless of medium or type of content. If the engineering behind the physical layer of the Internet changes and tiering must occur, it must be consumer-led, rather than operator-determined, access tiering. It must be matched with meaningful disclosure requirements and contractual protections best balance the reasonable demand that there be an incentive to invest in Internet infrastructure with the public interest in a 'non-discriminatory' Internet."[28] A Net Neutrality policy decision map (See Appendix 2) is important to help understand the steps that must be taken and the process that must follow in order to further address the Net Neutrality debate. The U.S. debate on Net Neutrality has generally been centered on what ISPs could or could not do unless the laws are put into place, which is what they are currently doing at the moment. In this way, it will require a steady raising of awareness, the

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[26] Ammori, Marvin. "The Case for Net Neutrality." 5.
[27] Nissenbaum, Helen. *Privacy in Context.* 56.
[28] Ganley, Paul and Ben Allgrove. "Net Neutrality: A Users Guide." 463.

channeling of ingenuity into productive avenues, and the implementation of liberal-democratic restraints.[29] Even though it is a slow process, actions and legislation must be pushed forward to prevent the upheaval of the Internet instead of waiting for it to be irrevocably changed.

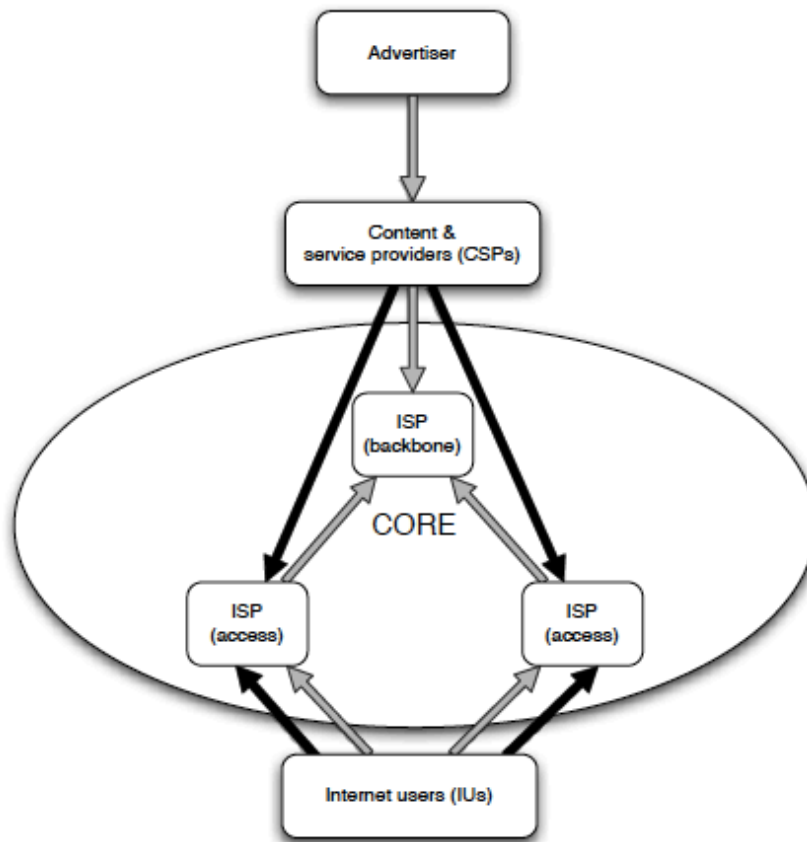[29] Nissenbaum, Helen. *Privacy in Context.* 56.

Appendix

Figure 1: Current (gray) and prospective (black) revenue streams in the Internet ecosystem

Appendix 1[30]

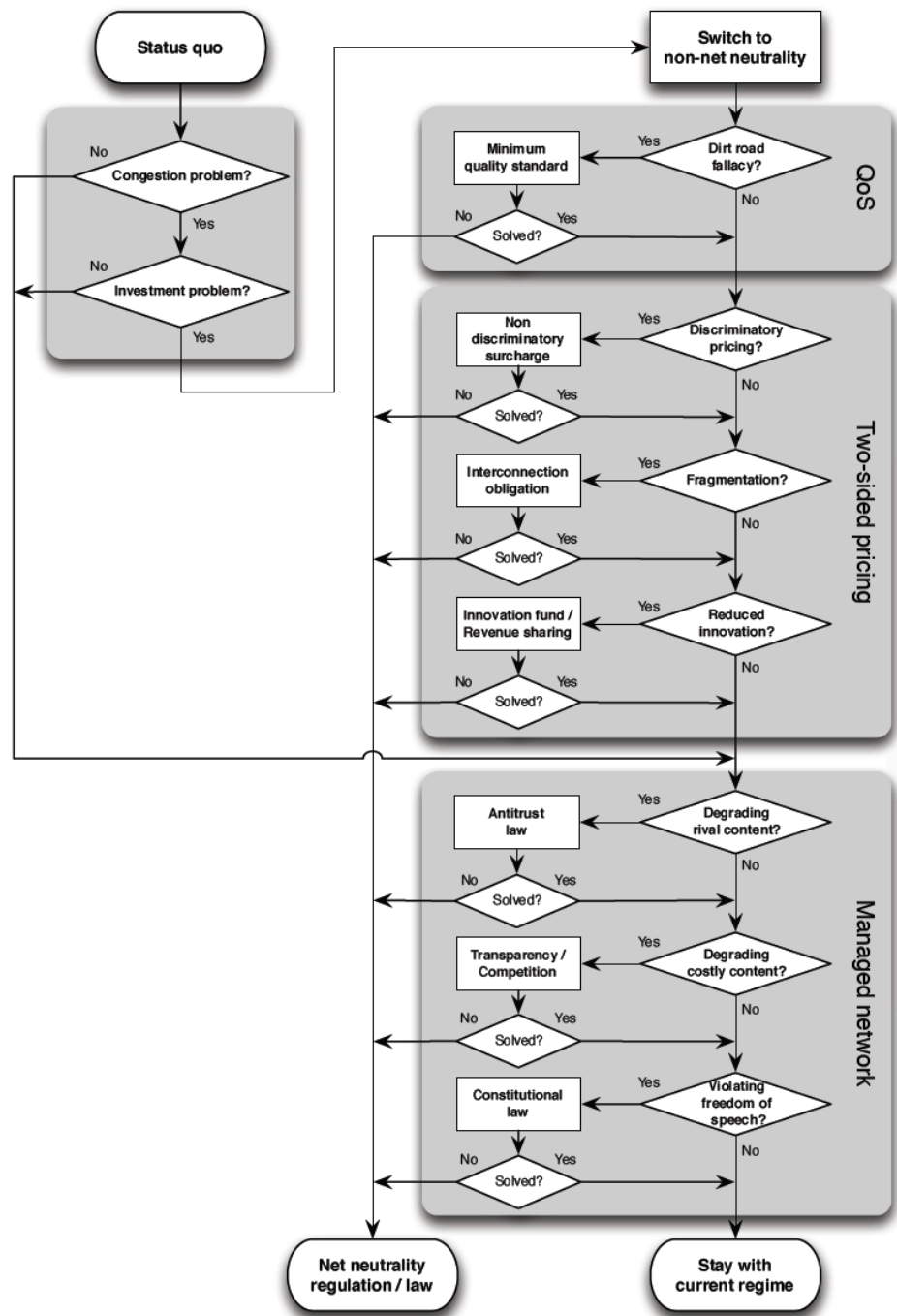[30] Krämera, Jan and Lukas Wiewiorraa and Christof Weinhardta. "Net neutrality: A progress report." 6.

Figure 4: Proposed net neutrality policy decision process

Appendix 2[31]

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[31] Krämera, Jan and Lukas Wiewiorraa and Christof Weinhardta. "Net neutrality: A progress report." 28.

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