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The web as a site of intractable governance

G. Anthony GIANNOUMIS[a,1]
[a]*Centre for Welfare and Employment Research at the University of Oslo and Akershus*

Abstract. To what extent does the demand and development of online anonymity interact with efforts to achieve universal design and preserve copyright protections? Based on original research, currently in progress, this article establishes a rational choice model for policy actors involved in the adoption of online anonymity technology. The analysis then compares the model to qualitative data collected from a document analysis of media and government publications and quantitative data on web search trends. The results demonstrate the importance of a universal design approach to web content, the limitations of current legislative approaches to accessibility, and the unintended effects of intellectual property laws. The paper concludes by identifying opportunities for extending the empirical examination of the web as a site of intractable governance.

Keywords. governance, human rights, disability, universal design, darknet, Tor, web accessibility

Introduction

Since the invention of the web in 1989, governance of the information and communications capacity of the web has devolved to private sector actors [1, 2]. These actors have institutionalized values of freedom of expression and freedom of information [3]. However, as the web diffused to encompass broader applications of personal, commercial and governmental use, governments began to regulate the content available on the web. Web content refers to textual, non-textual, and interactive information. Contiguously, technology developers began to innovate novel means for anonymously exchanging information on the web. Therefore, based on original research, currently in progress, this article aims to explore the web as a site of intractable governance. Specifically this article asks, "To what extent does the demand and development of online anonymity interact with efforts to achieve universal design and preserve copyright protections?"

Anonymously generated and retrieved web content constitutes a fundamental aspect of darknets. Darknets refer to refer to web content hosted by a decentralized and distributed network. Darknets constitute part of the deep web. The deep web refers to websites that search engines cannot index [4]. Table 1 outlines the definitional relationships between the web, the deep web and darknets. Users typically adopt online anonymity technology to access darknets. Thus, darknets represent what previous research has referred to as an intractable governance site [5].

[1] Corresponding Author.

Table 1. A comparison of the definitions and technological relationships between the web, the deep web and darknets.

The Web	The Deep Web	Darknets
Web content typically indexed by search engines.	Web content publicly available, but not indexed by search engines.	Web content not indexed by search engines, hosted and accessed using anonymity technologies.

Online anonymity defies regulation and enforcement due to the inherent technological challenges of identifying and assigning liability. Therefore, darknets represent an intractable governance site because the institutional character of the technology avoids regulation. Users can access darknets using anonymity technologies such as Freenet or Tor [6, 7]. Criminal law enforcement has encountered challenges in identifying and prosecuting violations of the law that have used these technologies. However, for civil law enforcement, the challenges become greater still as the costs of investigating and prosecuting violations of the law typically prohibit individuals, advocates or businesses from seeking redress [8, 9].

This article begins by reviewing the literature at the intersection of human rights and the governance of web content, focusing specifically on antidiscrimination, property rights and privacy. This brief review provides a framework for identifying policy actors involved in the adoption of online anonymity technology for the illegal consumption and distribution of copyrighted works and the article establishes a rational choice model for those policy actors. The article then presents data from a qualitative document analysis of media and government reports and quantitative data on web search trends that empirically demonstrates the values of these policy actors. It continues by comparing this evidence with the rational choice model, and concludes by discussing options for future research in web governance and human rights.

1. Human rights obligations and the governance of web content

In a 2011 report, the UN recognized that access to the internet supports "freedom of opinion and expression, including the right to seek, receive and impart information" [10]. The report differentiates human rights related to accessing the internet and accessing web content. Previous empirical research has investigated the governance of the web through the application of human rights to web content, including antidiscrimination [11-13], property rights [3, 14-16], and privacy [17, 18]. The complex interaction between policies implemented to support these rights and policy actors embedded in social and political institutions provides a useful framework for exploring the demand and development of online anonymity and efforts to achieve universal design and preserve copyright protections.

In terms of antidiscrimination, previous research has focused on the usability of web content by persons with disabilities and older persons [19]. Previous research, advocacy efforts, and policies have referred to web accessibility as a fundamental aim of equal participation for persons with disabilities on the web [12, 13, 20, 21]. In applying antidiscrimination regulations to the web, an international regulatory regime emerged to promote web accessibility [13]. In addition, advocates used universal design principles to promote the commercial benefits of accessibility. However, despite the scale and scope of these regulatory efforts, the web remains largely inaccessible to persons with disabilities [11, 13, 22].

In terms of property rights, previous research has focused on the application of copyright and copyright protection laws to web content [3, 14, 15]. However, copyright legislation has had the unintended effect of creating barriers to web accessibility [16, 23]. In 2013, the World Intellectual Property Organization, a UN agency, adopted the Marrakech Treaty to facilitate access to published works for persons with disabilities. This treaty creates a mandatory exception to copyright that allows disabled peoples organizations to provide accessible reproductions of copyrighted works without prior authorization of the copyright holder [24].

Previous research has also focused on privacy [17, 18]. Due to the development, by the Internet Engineering Task Force, of technology that provides unique identifiers for internet users, interested parties may easily and efficiently identify computers and, with the addition of a few extra data points, the identities of individuals [1, 25]. Identifying an individual web user typically requires a request from a public agency or court for an Internet Service Provider to release the name of the individual. However, due to sophisticated data mining technologies, a series of data points (e.g., IP address, GPS location data, and web browsing history and patterns) can ascertain the identity of an individual on the web. Data mining refers to the identification of patterns from large data sets that rely not simply on statistics but on technology to intelligently analyze and interpret the data. This ability has the potential to circumvent laws that protect privacy as a variety of policy actors readily collect and distribute this data.

In response to privacy concerns, users have adopted online anonymity technologies [17, 18]. Previous research has associated darknets with activities that violate the law, violate social norms, or venerate free speech. However, to characterize the majority of the activity that occurs on darknets as simply illegal, overlooks the normative aspects of legality [9]. As such, the activity on darknets demonstrates the sometimes-conflicting policy approaches, used to support human rights obligations (e.g., legislation that attempts to preserve accessibility, copyright, and privacy). As such darknets demonstrate a complex policy dilemma due to the multitude and diversity of policy actors involved in these areas of law [8, 14, 15, 26]. Further, the preferences of this complex network vary both within and between policy actors and have changed over time. Therefore, understanding this dilemma requires data on the subjective experiences of policy actors.

Lacking this data, this article operates under several assumptions. To develop a model for the interaction of policy actors, I assume the rational and strategic choices of policy actors. I limited the model to including content publishers, consumers and technology developers based on the assumption that universally designed content relates to violations of copyright law and the adoption of online anonymity technology [27]. While empirical research has not defined this relationship, I believe this assumption merits investigation as universally designed content has the potential to satisfy the market demand for flexible and easy to use web content and specifically applies to copyrighted works. In order to develop the relationships and interactions between these policy actors further, the analysis compares the model to qualitative data collected from a document analysis of media and government reports and quantitative data on web search trends.

2. Model of policy actors involved in universal design, copyright and online anonymity

Figure 1 contains an overview of the model used in this analysis. The first part of this model concerns content publishers and consumers. Content publishers have the initial choice to invest in creating and distributing universally designed content or to invest in products designed and distributed to a narrower market. Universally designed content refers to flexible, easy to use and accessible web content. Consumers respond by either consuming content by means that do not infringe on copyright protections, or by means that infringe on copyright protections. Content publishers attempt to minimize copyright infringement through enforcement and the use of deterrents such as Digital Rights Management technologies. Digital Rights Management technologies refer to tools used by producers to control the use of digital content. Aware that these enforcement efforts require substantial costs to producers, consumers accept minimal risk of individual penalties.

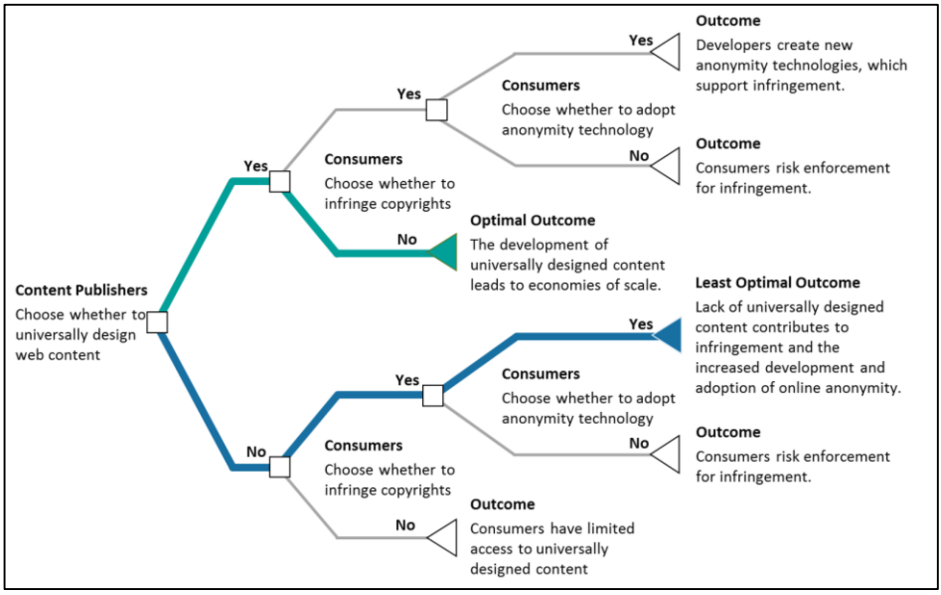

Figure 1. Rational choice model

If content publishers choose to produce universally designed content and consumers choose not to infringe copyright, then content publishers maximize the value of the intellectual property and consumers minimize the risk of individual enforcement. However, if content publishers choose to produce universally designed content and consumers choose to infringe copyright, then content publishers lose some of the investment value in universal design, and consumers risk prosecution. Alternatively, if content publishers choose not to produce universally designed content and consumers choose not to infringe copyright, then disabled or older consumers may not have the ability to access the content. Therefore, the content publishers lose some of the market share of the content, while consumers that can access the content do so without the benefits of universal design. Finally, if content publishers choose not to produce

universally designed content and consumers choose to infringe, then content publishers again lose some of the market share of the content due to inaccessibility, while consumers risk enforcement.

The second part of this dilemma concerns technology developers and results from outcomes where consumers infringe copyright. Consumers first choose to infringe copyright anonymously or identifiably. Consumers can achieve anonymity by adopting anonymity technologies such as Freenet or Tor. Developers respond to this adoption by developing easier to use and stronger encryption and anonymity technologies. Consumers use online anonymity technologies to reduce the risk of enforcement for copyright infringement. Developers respond by investing in anonymity technologies as the demand for these technologies increases.

If consumers adopt online anonymity technology, then consumers minimize the risk of enforcement and developers maximize the potential of current and future investments in technology development. Alternatively, if consumers do not adopt online anonymity technology, then consumers risk potential enforcement.

Therefore, for all policy actors to benefit, the optimal outcome results when producers create universally designed content that generates economies of scale for persons with disabilities and older persons. In response, the availability of universally designed content reduces incentives for copyright infringement due to increased usability and flexibility, thus reducing the demand for online anonymity technology and the use of online anonymity technology to create content.

In contrast, the least optimal outcome results when content publishers do not create universally designed content, which creates barriers for accessibility and encourages infringement by consumers. This leads to enforcement efforts, and in response, consumers increasingly adopt online anonymity technologies. Developers respond by recognizing the opportunity to invest in creating new online anonymity technologies. Thus, accessing content through darknets becomes an increasingly legitimate method for consuming content. However, the use of online anonymity technologies have the perverse effect of creating additional barriers to accessibility, which results in a new digital divide. This digital divide separates those with the means to access content via online anonymity technologies and those that cannot.

While acknowledging that the complexity of the decision to infringe copyrights and adopt online anonymity technologies goes beyond the mechanisms captured in the model, for the sake of parsimony, this model does not include these mechanisms. This model also does not include policy actors such as disability advocates, private interest groups, privacy advocates, regulators and legislators. These actors, through interactions with content publishers, consumers, and developers add additional complexity not captured in this model. Although not within the scope of this article, these mechanisms and policy actors provide useful areas for further investigation. The next section attempts to capture the explicit norms of the policy actors captured in this model.

3. Policy actors values

3.1. Copyright

Copyright refers to a temporary exclusive right over the expression of an idea once that idea exists in some material, reproducible form [28, 29]. Both national copyright laws

and international treaties have had the unintended effect of encouraging the use of darknets for distributing web content [15].

Since the 1990s, the production and consumption of media content has transitioned to the web. Prior to the web, content publishers monopolized many of the channels used to distribute media content [30]. The availability of the web has equalized the ability to produce and distribute media content among previously established content producers, market entrants and the broader public [15, 26, 31]. The ability to produce media content has diffused across the technological, legal and financial boundaries previously established by regulators and content publishers [30]. This equalization produced unprecedented growth in the amount and types of creative works that individuals, groups, and organizations have produced.

These trends forced content publishers to adapt content for distribution over the web and adopt new business practices to simultaneously ensure the continued viability of established business models and create new business models to attempt to compete on the web [32]. However, this transition has generated inequalities in how users generate and consume content. Though copyright law intends to protect the rights of content creators and encourage the production of creative works, these laws have not adjusted to the introduction of the web [33, 34]. Contrarily, copyright laws have preserved a business model that has yet to adopt universal design principles [35, 36].

The failure to adopt universal design principles has partly contributed to a social movement that relies on illegally copied and distributed media content to satisfy market demand. As these copyright infringement efforts continue, content producers have begun to condone copyright infringement as part of the distribution of media content in the information society and acknowledge copyright infringement as an indicator of successful distribution [37-39]. The result of this business model, which fails to respond to the demands of consumers, further contributes to accessibility barriers.

National and supranational regulators continue to struggle to influence web content accessibility and the legal creation and distribution of media content through copyright law [40]. However, these laws have failed to reduce copyright infringement substantially [26, 31, 41]. These laws have also conflicted with exceptions such as fair use, which limit the exclusive rights of copyright holders. Copyright laws have also contributed to abusive practices where enterprises have attempted to remediate potential copyright violations through mass litigation aimed at extracting settlements from individuals [42-44]. As copyright infringement continues to provide a socially and economically legitimate, though illegal, mechanism for social participation, copyright law that allows these business models to persist also contributes to barriers to achieving web accessibility and universally designed web content.

3.2. Anonymity

Consumers have used online anonymity technology as a means of illegally consuming and distributing copyrighted works [14, 15]. The broader implications of online anonymity technologies and the social response that has expanded the appeal of these technologies provides a useful case for examining the conflicting values of content publishers and consumers. As discussed previously content publishers incentivize the adoption of online anonymity technology by adhering to a business model that does not utilize universal design principles. National governments further contribute to the adoption of online anonymity technologies directly, by financing research and

development, and indirectly, by suppressing freedom of expression and conducting surveillance [45].

The adoption of online anonymity technologies relates to the use of darknets. Darknets, as described previously, constitute part of the deep web and consist of a range of technologies that operate using the internet through non-traditional means and enable users to remain anonymous [8, 9, 14, 17]. Darknet related technologies preserve anonymity by distributing and encrypting web content throughout the users of the network. Therefore, darknets enable users, each of whom hosts portions of this encrypted web content, to claim legal immunity. However, due to technological advances in decryption, darknets cannot ensure anonymity in perpetuity. Two popular examples of darknet technologies include Freenet and Tor.

Freenet, initially released in 2000, consists of open source software that allows users to anonymously communicate, share files and browse and publish web content available exclusively through the Freenet [6, 46]. Freenet sponsors include a wide variety of personal and commercial interests including, privacy advocates and technology enterprises such as Google [47]. Tor functions similarly to Freenet, however Tor allows users to access the web as well as darknets [48]. The initial development of Tor began in 2002, and Tor sponsors include a wide variety of personal and commercial interests, however US and Swedish public agencies, technology enterprises and free speech advocates constitute the majority of these sponsors [49]. Users typically experience these technologies as inefficient and inaccessible. Therefore, darknet use persists only as a niche activity. Nevertheless, as technology advances and external factors incentivize users to participate in darknets, these barriers may diminish [15, 45].

Web search data provided by Google offers a useful indicator of the adoption and development of these technologies. Figure 2 shows the trends of Google searches for the keywords “Tor” and “Deep Web” from 2004 to 2013 (as of the writing of this article). Google measures search trends according to the weekly search volume as a percent of the highest search volume for each period relative to each keyword. The search trends for both “Deep Web” and “Tor” demonstrate increasing search activity, though the increased search activity related to the “deep web” appears as a more recent phenomenon. However, Figure 3 demonstrates a contrasting trend.

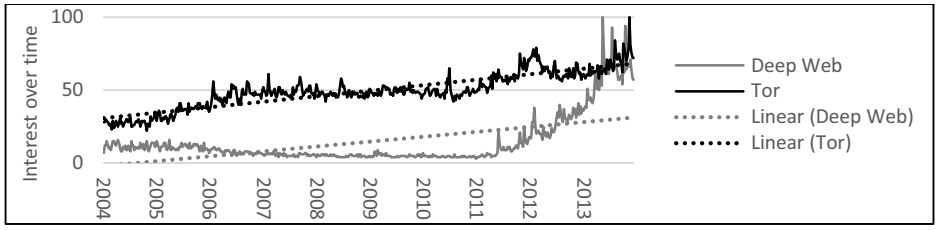

Figure 2. Interest over time for search terms “Deep Web” and “Tor”

Figure 3 shows the trends of Google searches for the keywords “darknet” and “Freenet” from 2004 to 2013 (as of the writing of this article). While the search trends for the keyword “Freenet” clearly demonstrate declining interest over time, the trends for the keyword “darknet” appear more discontinuous though with a gradual increase over time. While this data provides limited empirical evidence of the adoption of these technologies, the data does demonstrate that the interest in these technologies relates to mechanisms that may vary with time. As the data indicate the volume of searches using Google, the results only provide a crude understanding of the popularity of these

technologies among the public. Therefore, the data provide a useful basis for exploring how interest over time relates to the mechanisms of adoption for online anonymity technologies.

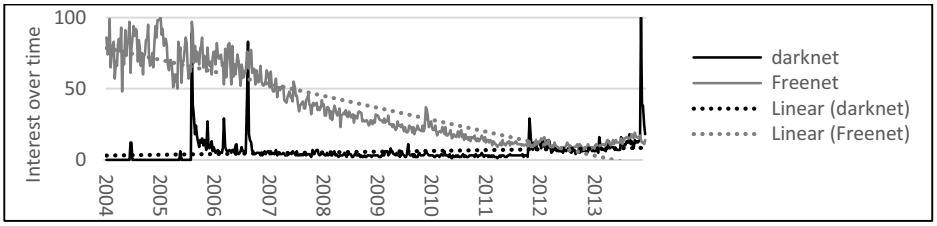

Figure 3. Interest over time for search terms "darknet" and "Freenet"

4. Universal design and web governance

Universally designed content constitutes the primary difference between the model established in this paper and the values of policy actors. This difference demonstrates how trends in internet consumer use interact with efforts to achieve web accessibility and preserve copyright. These uses relate to a policy regime where existing copyright laws have had the perverse incentive of entrenching barriers to a universally designed web. However, the results of this paper also demonstrate that other mechanisms contribute to the universal design of the web. These mechanisms relate to whether universally designed content can achieve economies of scale, and whether consumers can adjust previously established preferences. In addition, though acknowledging the significance of freedom of expression, as a motivation to adopt online anonymity technologies, this paper has not explicitly investigated the interaction of freedom of expression and online anonymity.

Due to limitations in the data, this paper only partly explains the mechanisms behind the adoption of online anonymity technologies. This paper deals with categories of laws (i.e., antidiscrimination, privacy, and copyright) and therefore, loses the nuances that an analysis of specific pieces of legislation could reveal. Understanding the interaction, implementation and unintended effects of these laws through in-depth or comparative case studies provides a useful area for further empirical investigation. Future research may use the results of this paper to examine how adoption patterns interact with the preferences and identities of policy actors and how the unintended effects of intellectual property laws conflict with human rights obligations. This paper also poses questions related to how censorship and the erosion of privacy, which threatens freedom of expression, combines with entrenched business models of content publishers, and how the combination of these mechanisms encourages users to adopt anonymity technology.

5. Conclusion

Regulations are inherently about rules to organize trust within a democracy [50]. This paper exposes the need for a new way of organizing democracy and of handling trust between a wide variety of policy actors including content publishers, consumers, and privacy and disability advocates. This need requires local solutions to global problems and innovative ways of restoring empathy rather than reverting to ineffective and

inefficient rulemaking and enforcement. This paper posits that rulemaking, voluntary or mandatory, has only generated moderate success at encouraging a universally designed web, and that the dilemma of regulating web content requires efforts beyond punishment or reward. Realizing human rights obligations in the information society requires the rapid adaptation of social norms to technological changes. As a codification of these norms, existing laws and regulations constitute an inadequate mechanism for achieving human rights.

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