

The times they are a-changin' (every six months)–The challenges of regulating developing technologies

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Abstract

For a period of time, the Internet has been seen as a virtually borderless communications medium, making it possible to think of a world not divided by geographical, political, cultural or even linguistic borders. However, the Internet is changing rapidly, continuously and substantially. The Internet of today is radically different to the Internet of five, ten or twenty years ago. Indeed, today, it is getting difficult to view the Internet as borderless. So-called geo-location technologies – technologies making it possible for Internet actors to identify the geographical location of those they come into contact with – challenge the Internet's borderless nature.

Drawing upon examples taken from the interaction between the law and geo-location technologies, this paper examines the challenges associated with the regulation of rapidly developing technologies. More specifically, focus is placed on such challenges in the context of Internet regulation.

1. Introduction

“Imagine there's no countries” is one of the first propositions in John Lennon's immortal classic titled *Imagine*.¹ For a period of time, the Internet made such a dream seem like a real possibility—we have had a virtually borderless communications medium making it possible to think of a world not divided by geographical, political, cultural or even linguistic borders. However, the Internet is changing rapidly, continuously and substantially. The Internet of today is radically different to the Internet of five, ten or twenty years ago.

This paper examines the challenges associated with the regulation of rapidly developing technologies. More specifically, focus is placed on such challenges in the context of Internet regulation. In highlighting the problems, examples are drawn from the interaction between the law and technologies making it possible for Internet actors to identify the geographical location of those they come into contact with (so-called geo-location technologies).

¹ JOHN LENNON, *Imagine* on IMAGINE (Parlophone 1971).

The paper starts with a brief overview of the geo-location technologies used to illustrate the problems associated with the regulation of rapidly developing technologies. It then proceeds to a discussion of two concepts that the law has developed in an aim to improve the quality of the regulation of rapidly developing technologies; that is, the concepts of *functional equivalence* and *technological neutrality*. Finally, it examines three different problems associated with the regulation of rapidly developing technologies.

2. Overview of geo-location technologies

As the law's attempts to deal with geo-location technologies constitute the lens through which this paper examines the challenges of regulating developing technologies, it is necessary to start with a brief introduction to geo-location technologies.

If a person operating a website could identify the geographical location of those who visit the website (*geo-identification*), she/he could either (a) adjust the content to the laws of the visitor's country, or (b) block out visitors from certain countries with particularly strict laws. While having gained little attention so far, technologies making possible such geo-identification are already in use. If a person in Australia, for example, accesses the website of US-based radio website Pandora², she/he is met with a polite message to the effect that, due to licensing constraints, people outside the US may not access the website.

Typically, the identification is based on the unique Internet Protocol (IP) address assigned to the visitor's computer, and works as follows: As the website visitor's web browser sends a request to access a particular website, it includes amongst other things, the IP address of the computer being

² Pandora Internet Radio, www.pandora.com.

used. The server hosting the relevant website passes on the IP address to a provider of a geo-location service, in what can be called a “location request”. Having built up a database in which IP addresses are matched to geographical locations, the provider of the geo-location service is able to make an educated guess as to the website visitor’s location. This information is passed on to the server hosting the relevant website in what can be called a “location reply”, and armed with this information the server hosting the relevant website can determine whether or not it will allow the website visitor to access the website, or e.g. what type of advertisement will be displayed on the website.

The accuracy of these products has been the object of debate. While the providers indicate the potential accuracy to be very high, “over 99% at a country level and approximately 92% at a city-level”³, they are after all trying to sell a product, and these impressive figures have been criticised.⁴ There is a range of factors affecting the accuracy of geo-location technologies. Due to the dual nature of the geo-location process, these factors can be divided into two categories: ‘source problems’ and ‘circumvention problems’.

The source problems are the problems associated with building up and/or collecting accurate geo-location data. In relation to IP addresses, there is no real equivalent to the address registers listing physical addresses, or the phone registers listing phone numbers, at least not currently. Consequently the ones creating databases of geo-location information must rely on other, less straightforward, methods. Obviously, the accuracy of the material in the geo-location databases depend on, and can never be better than, the accuracy of the collection of that data. Common

³ Digital Envoy product sheet (on file with the author).

⁴ See e.g. Information Technology Association of America, *ECommerce Taxation and the Limitations of Geolocation Tools* at 6, Feb. 5, 2007 available at <http://www.ita.org/taxfinance/docs/geolocationpaper.pdf>.

methods of collecting relevant material include, for example, gathering data from registration databases,⁵ network routing information, DNS systems, host name translations, ISP information and Web content.⁶ All of these sources may provide inaccurate information.⁷

Turning to circumvention problems, it can be noted that, while some circumvention techniques are technologically advanced (e.g. deep linking to streaming video content without accessing the HTTP server⁸), others are easy enough to be used by virtually anyone (e.g. anonymising techniques⁹) or even inherent in the system-structure (“tunnelling methods”¹⁰). With this in mind, people with sufficient skill and motivation will presumably always be able to circumvent geo-location technologies.

Apart from the use for restricting access to Internet content based on geographical criteria, geo-location technologies have several other uses. For example, geo-location technologies can be used for fraud detection, spam minimisation, network efficiency and content targeting (e.g. geographically targeted advertisement). However, at the same time, the use of geo-location technologies has at least one major negative consequence – it has the potential to destroy the Internet’s ‘borderlessness’. The ability to communicate freely across borders is doubtlessly one of the key ingredients in the Internet’s enormous success, and the use of geo-location technologies

⁵ Réseaux IP Européens Network Coordination Centre, <http://www.ripe.net> (Last visited 17 May 2007).

American Registry for Internet Numbers, <http://www.arin.net> (Last visited May 17, 2007).

Asia Pacific Network Information Centre <http://www.apnic.net> (Last visited May 17, 2007).

Latin American and Caribbean IP address Regional Registry <http://lacnic.net> (Last visited May 17, 2007).

⁶ See e.g. *Internet Geography Guide – A NetGeo White Paper*, available at <http://www.netgeo.com> (Last visited May 17, 2007).

⁷ Benjamin Edelman, *Shortcomings and Challenges in the Restriction of Internet Retransmissions of Over-the-air Television Content to Canadian Internet Users*, at 3-7 available at <http://cyber.law.harvard.edu/people/edelman/pubs/jump-091701.pdf> (Last visited May 17, 2007).

⁸ Edelman, *supra* note 7 at 10.

⁹ Edelman, *supra* note 7 at 8.

¹⁰ Edelman, *supra* note 7 at 9.

works against this – geo-location technologies places borders on the borderless Internet, thereby making it more similar to the physical world divided by borders of various kinds, and a less useful tool for communication.

3. Functional equivalence and technological neutrality¹¹

One often sees reference to the concepts of functional equivalence and technological neutrality in literature relating to Internet regulation.¹² Indeed, these two concepts are frequently used as guiding principles for how governments approach Internet regulation:

As far as possible, instead of the creation of new norms for electronic commerce and internet operations, existing principles, rules, and procedures can and should be applied, in particular by way of interpretation, including the use of functional equivalents. [...] When new norms are needed, they should be technologically neutral.¹³

But what do these concepts really mean? In discussing the concept of functional equivalence, the UNCITRAL's *Guide to Enactment of the Model Law on Electronic Commerce* (1999) noted that:

[T]he functional equivalence approach [...] is based on an analysis of the purposes and functions of the traditional paper based requirement with a view to determining how those purposes or functions could be fulfilled through electronic commerce techniques. [...] [T]he adoption of the

¹¹ Parts of the discussion in this section draw upon SVANTESSON, D, PRIVATE INTERNATIONAL LAW AND THE INTERNET, (Alphen aan den Rijn, Kluwer Law International, 2007).

¹² See e.g. Andrew Murray, *Entering Into Contracts Electronically: The Real W.W.W.*, in EDWARDS & WAEDELDE (EDS.), LAW AND THE INTERNET: A FRAMEWORK FOR ELECTRONIC COMMERCE (Hart Publishing, Oxford, 2000) 17-35.

¹³ Press Release, the Geneva Round Table on Electronic Commerce and Private International Law, by the Hague Conference on Private International Law (On file with author).

functional-equivalent approach should not result in imposing on the users of electronic commerce more stringent standards of security (and the related costs) than in a paper-based environment.¹⁴

Conceptually, technological neutrality can be viewed as a sub-quality of functional equivalence. In the New Zealand Law Commission's *Electronic Commerce Part One: A Guide for the Legal and Business Community* "technological neutrality" is described in the following terms:

Technology has advanced with great speed in recent years. It is likely to continue to do so. Unlike technology, the law tends to develop slowly, usually by reacting to situations only as they arise. It is therefore vital that any reform of the law be drafted so as to take account not only of the technology currently available, but also that which has yet to be developed.¹⁵

The aims of functional equivalence and technological neutrality could be seen as extensions of a more general goal applicable to any form of regulation – all laws must be drafted at a suitable level of generalisation. In other words, all laws have to aim to be applicable where such application is desirable, but not applicable where application is undesirable. Despite this foundation in an undisputable goal for legal drafting, and despite the fact that functional equivalence and technological neutrality have become widespread guiding principles for how legal drafters approach Internet regulation, the two concepts have not been free from criticism.

¹⁴ UNCITRAL, MODEL LAW ON ELECTRONIC COMMERCE WITH GUIDE TO ENACTMENT 1996 WITH ADDITIONAL ARTICLE 5 BIS AS ADOPTED IN 1998, at 20-21 (1996).

¹⁵ NEW ZEALAND LAW COMMISSION, ELECTRONIC COMMERCE PART ONE: A GUIDE FOR THE LEGAL AND BUSINESS COMMUNITY, report 50 para 41, at 17 (Parliamentary Paper E 31AK 1998).

In an interesting article Escudero-Pascual and Hosein demonstrate the potential downside of technology-neutral solutions:

‘[A] reason for technology-neutrality is to ensure that new laws do not need to be passed every time a new technology is invented. However, technology-neutral language may be used to ignore, willful or not, the challenges, risks, and costs to applying powers to different infrastructures.’¹⁶

In other words, a good technology-neutral solution of today, is not guaranteed to make sense in relation to a future technology simply because it is technology-neutral. A hypothetical example will provide more detail. Imagine the work on an Internet-related international convention, perhaps having lasted for ten years or more, resulting in a technology-specific text. If such a convention was completed in the late 80’s or early 90’s, it would presumably have addressed, for example, BBS communication, but certainly not WWW communication.¹⁷ Keeping in mind the current high speed of the technical development, and the slow legislative process both domestically and internationally, it may be pointless to create Internet-related technology-specific law. At the same time we must question what effect a technology-neutral rule constructed in the late 80’s or early 90’s to perhaps address a BBS-specific concern would have on the WWW or P2P communications in use today. In conclusion, in the drafting of legal rules one must balance the risk of those rules becoming outdated and thereby useless,¹⁸ and the risk of those rules being applicable in situations they were not suited for.

¹⁶ A. Escudero-Pascual and I. Hosein, *The Hazards of Technology-Neutral Policy: Questioning Lawful Access to Traffic Data*, www.ssrc.org/programs/itic/publications/civsocandgov/hosein.pdf (Last visited Feb. 12, 2008).

¹⁷ *The reader will recall that the use of the WWW is largely a mid-90’s and onwards trend.*

¹⁸ *Which, in turn, would call for new rules.*

Further, it is not always obvious how the concepts of functional equivalence and technological neutrality successfully are to be applied in relation to electronic communications. For example, the publisher of a newspaper would ordinarily be publishing within a local area, or a country or, if very large, a region. The technology of newspaper publication is such that a newspaper will only be available at those places the publisher has targeted. It could be said that the starting point is zero percent publication-coverage. For that number to increase, the publisher must target a community, country or region with its newspaper. Web publication works in exactly the opposite way. Once the material is made available on the web, it has virtually one hundred percent publication-coverage, and for that percentage to decrease, the publisher must take action by ‘dis-targeting’ undesirable forums. The legal significance of this considerable structural difference was tested in *Dow Jones & Company Inc v Gutnick*¹⁹. In that case, the High Court ruled that a Victorian court was allowed to exercise jurisdiction over, and apply its laws to, a US-based publisher in relation to material posted on a website hosted in the US if the defamatory material was read by somebody within the state of Victoria. It is possible that the Court was, consciously or unconsciously, guided by the concepts of functional equivalence and technological neutrality when they stated that:

However broad may be the reach of any particular means of communication, those who make information accessible by a particular method do so knowing of the reach that their information may have. In particular, those who post information on the World Wide Web do so knowing that the information they make available is available to all and sundry without any geographic restriction.²⁰

¹⁹ *Dow Jones & Company Inc v. Gutnick* (2002) 210 CLR 575.

²⁰ *Id.* 605.

If this can, indeed, be seen as an application of a functional-equivalent and technologically approach, it seems undisputable that such an application is harmful to the Internet, as it will force Web publishers to employ technologies to take the zero percent publication-coverage as their starting point, instead of the one hundred percent publication-coverage (which could be said to represent a better utilisation of the technology).

To conclude so far, the concepts of functional equivalence and technological neutrality work rather well in some contexts, such as UNCITRAL's *Model Law on Electronic Commerce*. However, they are not a miracle cure for the regulation of rapidly developing technologies.

4. Lacking knowledge of existing technologies leading the law astray

Perhaps the most obvious problem associated with the regulation of rapidly developing technologies is that, where the legal profession fails to stay in tune with technology, the application of the law may suffer in quality. One example of this is Simpson J's judgment in the Internet defamation dispute between Macquarie Bank Limited and Andrew James Downe on the one hand, and Charles Joseph Berg on the other.²¹ There, the plaintiffs were seeking an injunction restraining the defendant from publishing allegedly defamatory material on a particular website.²² During the proceedings, the plaintiffs limited the order sought to publications within New South Wales. Despite this, Simpson J refused the order, stating that:

²¹ *Macquarie Bank Limited & Anor v. Berg* [1999] NSWSC 526.

²² *As it turned out, however, the defendant in this action was arguably not the publisher of the allegedly defamatory website. During the proceedings a US resident, Fernando Adrian Sirio, stated in an affidavit that he was the responsible publisher, and that he had constructed the relevant website in conjunction with his studies at University of California, San Diego. It was, however, admitted that Sirio had received some of the material from Berg.*

An injunction to restrain defamation in NSW is designed to ensure compliance with the laws of NSW, and to protect the rights of plaintiffs, as those rights are defined by the law of NSW. Such an injunction is not designed to superimpose the law of NSW relating to defamation on every other state, territory and country of the world. Yet that would be the effect of an order restraining publication on the Internet. It is not to be assumed that the law of defamation in other countries is coextensive with that of NSW, and indeed, one knows that it is not. It may very well be that according to the law of the Bahamas, Tazhakistan [sic], or Mongolia, the defendant has an unfettered right to publish the material. To make an order interfering with such a right would exceed the proper limits of the use of the injunctive power of this court.²³

This conclusion was heavily influenced by the perception that the publication of Internet materials can not be geographically restricted:

The limitation [to publication occurring in NSW only] is ineffective. Senior counsel [for the plaintiffs] acknowledged that he was aware of no means by which material, once published on the Internet, could be excluded from transmission to or receipt in any geographical area. Once published on the Internet material can be received anywhere, and it does not lie within the competence of the publisher to restrict the reach of the publication.²⁴

The fact that neither the judge, nor the counsel for the plaintiff, were aware of the geo-location technologies discussed above may have been determinative in this dispute. In other words, counsel's lacking knowledge of existing technologies caused him to overlook a technology that

²³ Macquarie Bank Limited & Anor v. Berg [1999] NSWSC 526, para. 14.

²⁴ *Id.*, para. 12.

could have had a decisive impact on the outcome of dispute. In turn this caused the judge to create an undesirably technology-ignorant precedent.

5. The law inadvertently affecting technological developments

There are instances where law makers opt for a particular approach without analyzing the impact their decision will have on the technological development. One such example is s. 6(1) of the *Interactive Gambling Act 2001* (Cth) which states that: “For the purposes of this Act, a *prohibited Internet gambling service* is a gambling service, where: [...] (c) an individual who is physically present in Australia is capable of becoming a customer of the service.” This provision requires website operators to be able to identify the geographical location of those who visit their websites, thereby encouraging the use of geo-location technologies. The Explanatory Memorandum to the Act shows that the drafters were aware of geo-location technologies.²⁵ However, considering the enormous impact that geo-location technologies may have on the Internet, it is not acceptable that law makers encourage their use without assessing the impact their decision may have on the future usability of the Internet.

Another example of the law inadvertently affecting the technological development of geo-location technologies is found in the transatlantic dispute between US Internet company, Yahoo!, and two French associations, La Ligue Contre Le Racisme et L’Antisemitisme and L’Union Des Etudiants Juifs De France. Yahoo! was operating a website which, amongst other things, contained an auction service where Nazi memorabilia/junk was frequently on offer.²⁶ The website could be

²⁵ THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA, EXPLANATORY MEMORANDUM TO THE INTERACTIVE GAMBLING ACT 2001, at 54 available at <http://parlinfoweb.aph.gov.au/piweb/Repository/Legis/oldEms/Linked/17010215.pdf>.

²⁶ However, the auction service was not at all specifically designed for the purpose of auction Nazi material.

described as the Yahoo! family's "flagship", and in contrast to the country-specific Yahoo! sites (e.g. www.yahoo.fr), this site was said to be aimed at the world at large.²⁷ When La Ligue Contre Le Racisme et L'Antisemitisme *et al.* attempted to have Yahoo! remove the Nazi material from the auction service, in accordance with French penal Code²⁸, Yahoo! refused.

Based on the expert evidence provided, Gomez J in the *Yahoo!* case, concluded that geo-location technologies are sufficiently effective to allow the defendant to implement them to prevent access-seekers located in France from accessing the Nazi memorabilia/junk in dispute.²⁹ In light of this, a judgment was handed down against *Yahoo!*.

The fact that courts have started to take account of geo-location technologies is a huge incentive for continued development. This, in turn, is likely to lead to improved accuracy, and this improved accuracy can motivate courts to place an even heavier emphasis on these technologies. It may be that this is a desirable development. However, without an in-depth analysis, we cannot know that, and being a development with unknown consequences, it must be seen as a dangerous development.

6. The law avertedly affecting technological developments, but without analysis

In some cases, law makers avertedly set out to encourage technological developments. The *Hageseth* case³⁰ involved a medical practitioner based in Colorado practicing medicine in California without a license, in that he prescribed a drug over the Internet knowing the recipient

²⁷ *A notion backed by the fact that country-specific advertisement was provided on the site.*

²⁸ French Penal Code § R645-1.

²⁹ International League Against Racism & Anti-Semitism (LICRA) and the Union of French Jewish Students (UEJF) v. Yahoo! Inc. County Court of Paris, 20 November 2000.

³⁰ *Hageseth v. Superior Court* 2007 Cal. Daily Op. Service 5647.

was based in California. The dispute related to whether a Californian court could exercise jurisdiction over the medical practitioner. In discussing the medical practitioner's claim that "a finding of jurisdiction [...] would not deter out-of-state physicians from prescribing medications for residents"³¹, the Court took note of the emergence of geo-location technologies and stated that:

The prospect of other technological developments counsels judicial caution in accepting technology-based arguments against the assertion of jurisdiction, as that would eliminate incentives for technology developers to innovate in ways that would facilitate law enforcement and support public values.³²

Here the Court was clearly eager to encourage the development of technologies it saw as helpful to law enforcement. However, there is no indication in the judgment of any account being taken of broader policy questions such as the detrimental impact geo-location technologies stand to have on the Internet's usability.

7. Concluding remarks

It has aptly been noted that: "Judges and legislators faced with adapting existing legal standards to the novel environment of cyberspace struggle with terms and concepts that the average [...] five-year-old tosses about with breezy familiarity."³³ With that in mind, the uneasy relationship between law and technological developments is not surprising. As outlined above, the law's struggle to keep up with technological developments results in a range of undesirable

³¹ *Id.* at 49-50.

³² *Id.* at 54.

³³ *American Libraries Association v. Pataki* (969 F.Supp. 160, 170 (S.D.N.Y.,1997)) Per Preska J.

consequences. First, where the legal profession suffers a lacking knowledge of existing technologies they may reach conclusions leading the law astray. Second, a lacking consciousness of the fragile balance that determines the future directions of the Internet may cause the law to inadvertently steer technological developments in a particular direction. Finally, the law may identify particular technological directions as desirable from an enforcement perspective, and thus decide to encourage the technology to develop in that direction. Where this occurs without any analysis of the broader implications, it is negligent and potentially harmful.

Further, while the concepts of functional equivalence and technological neutrality are useful in some contexts, they do not adequately address the challenges of regulating rapidly developing technologies.

While it can be hoped that the above identification, structuring and discussion of the problems that flow from the law's inability to keep up with technological developments has some value in itself, this paper would make a more significant contribution if it also could present a solution to those problems. Unfortunately, however, there is no miracle cure to these problems, and the only way to ensure that the law deals with technological developments in a sensible and informed manner, is that more attention is given to the consequences of any direction-choices made by the law. At the same time, it is acknowledged that paying more attention to the consequences of direction-choices made by the law inevitably slows down the legal development even further, which in itself, makes the law less capable of addressing rapidly developing technologies. In the end, the only way of ensuring that the law deals with technological developments in an appropriate and informed manner, while at the same time maintaining an adequate pace of legal

development, is found in an increased technological understanding and ‘savvyness’ amongst the legal profession, law and policy makers and the academic community.

As to the specific issue of the Internet’s borderlessness, it seems that the parties favouring a geographically oriented Internet are far stronger and more capable than those seeking to protect the Internet’s borderlessness—we enjoyed a short period during which we had access to a virtually borderless communications medium, but it was not to last. This article opened by making reference to the lyrics of a song by John Lennon, and it can suitably end by reference to the lyrics of another of his master pieces. Not least due to the law’s careless approach to how it affects technological developments, “The dream is over”³⁴.

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³⁴ JOHN LENNON, *God* on JOHN LENNON/PLASTIC ONO BAND (Apple/EMI 1970).

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