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# Technology-mediated barriers, a counter-trend

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## ABSTRACT

New technology generally increases the opportunities for people. That is however not always the case. This article draws attention to the intricate interplay between new technologies and legal regulation, sometimes leading to regulatory arrangements that create new barriers for some actors. Four cases are discussed that illustrate how barriers may arise. These cases concern GM seeds, large scale collection of telecommunications' data by the NSA, copyright law and geo location technology. These cases highlight different causes for barriers to arise. The article tentatively formulates first thoughts on how the causes for the barriers can be characterised on a higher abstraction level.

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## 1. Introduction

Large factions of society are characterised by techno-optimism. Technology will solve our problems, whether they lay in the field of a shrinking population, the environment or sustainability or any other field. Technology will ensure economic prosperity. In general, technology will enhance the options people have in life. From a historical perspective, it is hard to argue with the techno-optimist's position. The improvement in living conditions in the past 150 years is not in small part attributable to technological progress. The impact that clean drinking water has had on people's lives is hard to overestimate. This essay does not question that there are good reasons to be a techno-optimist. What this essay tries to do is to warn against overgeneralisation and over-optimism. New technologies often enter a complicated web of regulation, market forces and social norms. The regulatory and normative framework in which a new technology falls usually is a bad fit. The overall effects of a new technology may be quite different from what techno-optimism likes

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to predict. The combination of new technologies with a largely traditional regulatory and normative framework may lead to ‘accidents’ in the form of barriers: behaviour that previously was allowed becomes impossible or forbidden, or it is new technology mediated behaviour that is the equivalent of the ‘traditional’ behaviour that becomes inhibited.

The question is whether unintended barriers are against the public interest and whether lawmakers should take them on board. In order to respond to this question, four indicative cases will be elaborated. The cases have been selected along two dimensions. The first dimension looks at the behaviour that is barred, limited or discouraged: is it existing behaviour or behaviour that has become possible through the new technology? The second dimension distinguishes between different new technologies: is the technology competing with the old technology (that it perhaps replaces) or is it technology causing a disruption? The former technology is functionally equivalent to old technology but perhaps more efficient. The latter technology generally has no fitting analogy in the past.

The purpose of the first dimension is to get a broader perspective than that of a new technology making existing practices and behaviour superfluous. It may otherwise be overlooked that also behaviour that has become possible by a new technology may be limited or discouraged. Especially, this ‘new’ behaviour has the potential to become relevant in the future.

The reason for the second dimension is that the barriers we discuss are by and large unintentional barriers. With disruptive technology that fundamentally changes current practices, it is virtually unavoidable that existing interests will be affected. This article aims to show that, where technology makes smaller steps, it is also possible that behaviour may be barred, limited, or discouraged unintentionally.

In this paper, four cases will be dealt with, in each of which the technology and the law are instrumental in creating a barrier. The first two cases show how a new technology may lead to a barrier to engage in behaviour that until then was perfectly normal, allowed and possible. The Monsanto case concerns a technology that replaces an old technology. The patenting of genetically modified crops creates a barrier for traditional and biological farming. The case of *First Unitarian Church of Los Angeles v NSA* involves a disruptive technology. It illustrates how ICT allowing unprecedented large-scale collection of telecommunications’ traffic data and analysis of the information obtained creates a chilling effect for the right of association. The last two cases show how a new technological development creates barriers for new technology-mediated behaviour. The UsedSoft and Redigi cases show how a technical switch in the distribution of copyrighted content leads to licensing conditions that are much less favourable to consumers of copyrighted works and bars them from certain behaviour. The Geo Location Technology case concerns a disruptive technology that allows the manager of a website to have control over the geographical

area in which the website is available. In the past, this control was elusive. However, the law may create obligations to use the new technology in ways that may harm certain interests. In the annex, a matrix is provided indicating the location of the cases in the framework outlined above.

It is hoped that this article increases awareness of the risk of new barriers coming into existence that are not in the public interest and that increased insight into the process helps to understand how the regulatory and normative reception of new technologies can be improved.

## 2. Cases

### 2.1. *Monsanto v Schmeiser* and *Monsanto v Bowman*

Farmers have always used seeds from the last harvest to sow in the subsequent season. The practice was to make a distinction between good seed from strong plants and weak seeds from poor plants. The former were separated and used for sowing in the next season. With the advent of patented seeds, this practice has come under pressure. This will be illustrated by the Monsanto-Schmeiser case.<sup>1</sup>

Monsanto, a producer of genetically modified seed materials, markets a herbicide containing glyphosate under the name ‘Roundup’. This herbicide is effective against weeds but unfortunately, it also affects the crop, such as canola, that a farmer cultivates. In order to overcome this problem, Monsanto modified the DNA of a canola gene so that the canola plant becomes resistant against herbicides containing glyphosate. The modified canola gene and cells were patented and the canola seeds with the modified gene are marketed under the name ‘Roundup Ready Canola’. The patented seeds grow out to full plants that carry seeds anew and these seeds also have the patented modification. In the licence agreement that farmers sign, they agree not to sow the ‘patented’ seeds they obtain from their harvests. They should buy new seeds from Monsanto every year as long as they choose to use the patented seeds.<sup>2,3</sup>

However, what about a farmer who never bought patented seeds from Monsanto and who never signed a licence agreement? Can he use patented seeds from his previous harvest? He may have come into possession of the seeds in an innocent way: plants are self-replicating and seeds from a neighbouring field can be carried by the wind to a farmer’s field.

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<sup>1</sup>*Monsanto Canada Inc v Schmeiser* [2004] 1 SCR 902, 2004 SCC 34.

<sup>2</sup>The expression ‘patented seeds’ is perhaps not completely correct. The seeds are not patented, it is part of the plant’s DNA that is patented. This is of course contained in the seed. For the sake of readability, however, the expression ‘patented seeds’ is used throughout this article.

<sup>3</sup>In the Monsanto case, sowing of harvested seeds was forbidden in the licence. So-called terminator technology makes seeds sterile, giving rise to a stronger position for GM seed companies. For the difficulties of regulation of this technology, see Graham Dutfield, ‘Should We Regulate Biotechnology Through the Patent System? The Case of Terminator Technology’ in Han Somsen (ed), *The Regulatory Challenge of Biotechnology: Human Genetics, Food and Patents* (Edward Elgar Publishing 2007), 203–13, 210–11.

Such a scenario gave rise to *Monsanto v Schmeiser*, which was litigated right up to the Canadian Supreme Court.<sup>4</sup> The facts of the case were as follows. Schmeiser, a Canadian farmer, grew canola. He never bought patented seeds from Monsanto and he never signed a licence agreement. However, tests conducted in 1998 showed that 95 to 98% of his 1,000 acres of canola crop was made up of Roundup Ready (RR) plants. It is unclear what the origin of the plants was. Schmeiser suggested innocent causes, such as seeds having been blown over from neighbouring fields and surviving his spraying of Roundup around the borders of his field and around power poles. The trial judge found however that ‘none of the suggested sources could reasonably explain the concentration or extent of Roundup Ready canola of a commercial quality evident from the results of tests on Schmeiser’s crop’.<sup>5</sup>

On final appeal, the Supreme Court concentrated on the question ‘whether Schmeiser, by collecting, saving and planting seeds containing Monsanto’s patented gene and cell, “used” that gene and cell’. Schmeiser possessed plants with the patented gene and cells, but he did not spray them with glyphosate. At least, this fact was not positively established. Was that enough to find ‘use’? The Court decided that ‘[p]ossession of a patented object or an object incorporating a patented feature may constitute “use” of the object’s stand-by or insurance utility and thus constitute infringement’. Proof that Schmeiser sprayed Roundup in 1998 was therefore not needed. It was enough that Roundup Ready Canola stood in the fields and that Schmeiser could spray Roundup, should the need arise.

If we assume that Schmeiser had a hand in the abundant presence of Roundup Ready Canola, this might tip the case in favour of Monsanto. There are, however, other scenarios imaginable that are more open. The Federal Court of Appeal in the case pointed towards such a scenario:<sup>6</sup>

[57] ... It is undisputed that a plant containing the Monsanto gene may come fortuitously onto the property of a person who has no reason to be aware of the presence of the characteristic created by the patented gene. It is also reasonable to suppose that the person could become aware that the plant has that characteristic but may tolerate the continued presence of the plant without doing anything to cause or promote the propagation of the plant or its progeny (by saving and planting the seeds, for example). In my view, it is an open question whether Monsanto could, in such circumstances, obtain a remedy for infringement on the basis that the intention of the alleged infringer is irrelevant. However, that question does not need to be resolved in this case.

In 2013, the US Supreme Court decided a similar case: *Bowman v Monsanto*. Farmer Bowman bought soybeans intended for consumption from a grain

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<sup>4</sup>*Monsanto Canada Inc v Schmeiser* [2004] 1 SCR 902, 2004 SCC 34.

<sup>5</sup>*Monsanto Canada Inc v Schmeiser* 2001-03-29, 2001 FCT 256, 118.

<sup>6</sup>*Monsanto Canada Inc v Schmeiser* (CA) [2003] 2 FC 165.

elevator.<sup>7</sup> Amongst these soybeans, were soybeans possessing the patented glyphosate resistance trait. He planted the soybeans, and sprayed the crop with glyphosate, killing all the plants not having the resistance trait. He harvested the remaining crop and used its seeds to sow later in the season. Bowman contended that Monsanto's patent on the soybeans he bought had been exhausted. The Supreme Court found unanimously in favour of Monsanto, applying the well-established rule in patent law that exhaustion does not extend to the right to make new copies of the patented article.<sup>8</sup> The fact that it concerned self-replicating biological materials did not make enough of a difference.

There are two levels at which a barrier comes into play in this type of cases. On the one hand, you could look at regular (ie licensed) use of RR canola and on the other hand you could look at involuntary use of RR canola, as in the scenario pointed out by the Federal Court of Appeal, quoted above.

Regular use of RR canola raises a barrier in the following way. RR canola has strong resistance against herbicides. Because of this property, many farmers have switched to the use of RR canola. Using RR canola according to the licence terms means that the farmers buy new seeds every year from Monsanto. This implies that for those farmers an end has come to the old practice of separating and saving the best seeds of the previous year. The slow and small-scale genetic improvements of plants as practised by these farmers has therewith ended. This is problematic because plants have more properties than resistance against herbicides (eg carrying bigger or smaller fruits, carrying more or less tasty fruits, growing faster or slower) and these properties are not further developed by farmers any more. Using RR canola puts a barrier up against a practice that has served farmers and their downstream customers well for centuries. Using Monsanto's seeds may even lead to monoculture. The time horizon of seeds has become one year.<sup>9</sup>

Involuntary use raises a barrier in the following way. It is likely that 'biological' plants and 'GM' plants cannot be separated completely. No watertight barrier can be put in place between the fields of neighbouring farmers. This could place a burden on farmers choosing to remain 'biological'. Seeds for RR canola cannot be distinguished from normal seeds. Only a chemical test or shown resistance against Roundup in a field can identify seeds as possessing the patented characteristic. This may result in 'biological' farmers having difficulty in proving to their customers that their product is 100% GM free, a fact customers mainly in Europe may want to be assured of.<sup>10</sup>

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<sup>7</sup>*Bowman v Monsanto Co*, No 11-796, 569 US (2013), [www.supremecourt.gov/opinions/12pdf/11-796\\_c07d.pdf](http://www.supremecourt.gov/opinions/12pdf/11-796_c07d.pdf)

<sup>8</sup>ibid 4–7.

<sup>9</sup>This may all not be a problem if RR only accounts for a small percentage of all fields. But as RR becomes more common problems may increase.

<sup>10</sup>The question of liability for the introduction GM seeds in the environment is not dealt with here. See eg Philippe Cullet, 'Monsanto v Schmeiser: A Landmark Decision concerning Farmer Liability and Transgenic Contamination' (2005) 17(1) *Journal of Environmental Law* 83, 105–107.

There is also the legal uncertainty as to whether the presence of genetically modified seeds is found to be infringing use of a patented article. Maybe it would be stretching patent law too far to find infringement against a farmer who acts as the Federal Court of Appeal indicates (aware, but not trying to increase the share of GM in his crop). However, what does this mean for the farmer's ability to use herbicides containing glyphosate, even in a lower concentration? Would this tip the scale and make the farmer's activities infringing (viz benefiting from a patented article without licence while absence of bad intentions is not relevant)? The possibility of activities being found to be infringing may have a chilling effect on biological farmers as well, they may become more circumspect about what they do and what they do not do. Has time run out for biological farmers?

These barriers result from the interplay between law (patent law and contracts or licences) and technology (development of genetic use restriction technology by GM and the impossibility of a watertight separation between GM and non-GM in the fields of farmers).<sup>11</sup> They are felt as barriers because they make it more difficult for farmers to proceed as they have always done before, while there is merit in their tradition and it is unclear whether modern GM can fully compensate for the loss of the tradition and its benefits (and whether the public wants that).

It is a tension between a patentee's rights to full enjoyment of the monopoly granted by the patent and agricultural traditions. On the one hand, patent law is strongly codified and uses compelling concepts. On the other hand, the tradition to use seeds from one's own land for sowing next year is not codified. It is allowed as a consequence of the physical property right in seeds, but this physical property right does not overrule the exclusive rights of the patentee. The regular-use case is decided in favour of patentees, the involuntary-use case is undecided.

If I see it correctly, fast, industrial genetic modification and slow, farm-scale genetic modification are not mutually exclusive from a technical or biological perspective. It is the interests of an industry, reinforced by patent and contract law that put up a barrier against farm-scale modification. This does not mean that it is easy to change. Patents would probably lose most of their value if farmers were to be allowed to sow their harvested GM seeds, without compensation to the patentee. However, I cannot escape the impression that there is a regulatory failure in that a reasonable compensation for patentees is not combined with freedom to operate for farmers. It must be possible to find

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<sup>11</sup>The barrier may be caused by the lack of public scrutiny in the development and use of GURTs and the licences that govern their supply. See Dan Burk, 'Legal Constraint of Genetic Use Restriction Technologies' (2004) 6(1) *Minnesota Journal of Law, Science and Technology* 254, 260–62, <http://ssrn.com/abstract=661181>; 'DNA Rules: Legal and Conceptual Implications of Biological Lock-out Systems' (2004) 92(6) *California Law Review* 1553, 1574–75, <http://scholarship.law.berkeley.edu/californialawreview/vol92/iss6/1>

a better regulatory accommodation here. The strength of strongly codified patents does not seem to give the right incentive. It allows patentees the opportunity to keep in place a regulatory arrangement that is in their interest, but that is suboptimal from a societal perspective. It is an opportunity that patentees understandably make use of. However, it is a forgone opportunity that it apparently has not proven possible to establish more elaborate and balanced regulatory arrangements.

## 2.2. The NSA case

On 5 June 2013, the *Guardian* published an order of the US Foreign Intelligence Service Court from which it became apparent that the NSA collected metadata from telecommunications provider Verizon about all telephone calls that Verizon customers made within the US or between the US and a foreign country.<sup>12</sup> These metadata included session identifying information (such as originating and terminating telephone number, IMSI and IMEI number),<sup>13</sup> trunk identifier, telephone calling card numbers and time and duration of a call. Prior to the publication in the *Guardian*, the public had no knowledge of the activities of the NSA detailed in the order and in similar orders directed at other telecommunications' providers. The authenticity of the Verizon order was confirmed by the Director of National Intelligence (DNI) on 6 June 2013.<sup>14</sup>

With the processing capabilities of modern ICT, the collection and analysis of vast expanses of metadata has become possible. The US government used these new technological possibilities to address the challenges it faces in the field of terrorism. The DNI indicated that it needed the metadata for identifying terrorism-related communications. Legally, the purpose for which the data were collected placed restrictions on the use that the government could make of the data. The DNI formulated it as follows:<sup>15</sup>

All information that is acquired under this program is subject to strict, court-imposed restrictions on review and handling. The court only allows the data to be queried when there is a reasonable suspicion, based on specific facts, that the particular basis for the query is associated with a foreign terrorist organization.

Some 20 political and advocacy groups doubted that the legal restraints provided enough protections for the public. Via the metadata, the government is able to see who regularly calls political or advocacy groups and thus is able to

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<sup>12</sup>See, [www.theguardian.com/world/interactive/2013/jun/06/verizon-telephone-data-court-order](http://www.theguardian.com/world/interactive/2013/jun/06/verizon-telephone-data-court-order)

<sup>13</sup>International Mobile Subscriber Identity number and International Mobile station Equipment Identity number.

<sup>14</sup>Press release of 6 June 2013 entitled 'DNI Statement on Recent Unauthorized Disclosures of Classified Information', [www.dni.gov/index.php/newsroom/press-releases/191-press-releases-2013/868-dni-statement-on-recent-unauthorized-disclosures-of-classified-information](http://www.dni.gov/index.php/newsroom/press-releases/191-press-releases-2013/868-dni-statement-on-recent-unauthorized-disclosures-of-classified-information)

<sup>15</sup>ibid 2.



get a rather accurate picture of who are (active) members of these groups. This is even more so because the government has access to a complete overview of metadata of customers of all telecommunications providers that were under orders as the one disclosed. This is likely to have a chilling effect on members of these groups. Moreover, because people are worried about being identified as members of these groups, this might lead to some hesitation about becoming or continuing to be a member of such groups. In July 2013, the political and advocacy groups filed a complaint at the district court of the Northern District of California.<sup>16</sup> They sought declaratory relief that the data collection programme violates constitutional rights under the First, Fourth and Fifth Amendment of the US Constitution. Furthermore, they seek injunctive relief *inter alia* aimed at ending the programme. No final decision has been handed down yet.

The advocacy groups rely on Supreme Court precedent about the right of association. In *NAACP v Patterson*,<sup>17</sup> the National Association for the Advancement of Colored People was ordered to produce membership lists in order for it to be allowed to set up an office in the state of Alabama. The NAACP refused to do so and was fined \$100,000 in contempt. The NAACP contested the constitutionality of the disclosure order before the Supreme Court. The Supreme Court held that in the case at hand it thought:<sup>18</sup>

it apparent that compelled disclosure of petitioner's Alabama membership is likely to affect adversely the ability of petitioner and its members to pursue their collective effort to foster beliefs which they admittedly have the right to advocate, in that it may induce members to withdraw from the Association and dissuade others from joining it because of fear of exposure of their beliefs shown through their associations and of the consequences of this exposure.

Hence, the US Supreme Court has held before that disclosure of information about membership of advocacy groups has a chilling effect and is unconstitutional. In the present case, the government has not required disclosure of membership lists directly, but it has collected data from which inferences about membership can be made, while there are legal safeguards in place that constrain the government in its discretion to use the data. Nonetheless, it is not unimaginable that members of advocacy and political groups are hesitant about membership.

Technology has made it possible to obtain and analyse large expanses of data. It is understandable that a government uses available technology for addressing the challenges it faces. However, it puts a government in an all-

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<sup>16</sup>*First Unitarian Church of Los Angeles v NSA*, CV-13-3287 JSW, filed July 16, 2013. Complaint available at: [www.eff.org/document/complaint-31](http://www.eff.org/document/complaint-31)

<sup>17</sup>*National Association for the Advancement of Colored People v Patterson*, No 91, 357 US 449, <https://supreme.justia.com/cases/federal/us/357/449/case.html>

<sup>18</sup>*ibid* 463.

knowing position. It is unclear to the outside world how effective legal restraints on the use of the information obtained are. In fact, the perception exists that legal restraints may be multi-interpretable and that enforcement is difficult. The expanse of data available to the government, the secrecy with which it is surrounded and uncertainty about the effectiveness of legal restraints give credence to the claim of policy and advocacy groups that there is a chilling effect on the right of association and free speech. Regulation has failed to garner sufficient trust.

### 2.3. Copyright cases

Copyright gives the maker of a work the exclusive right over certain acts of exploitation of the work. The exclusive right allows the maker of a work to realise certain beneficial goals, such as earning an income, making sure the work is dealt with respectfully and, hopefully, the exclusive right proves to be an incentive to create more works. However, the exclusive right may also be used in ways that are less favourable for other stakeholders, such as consumers or prosumers of works. Technical developments sometimes prove a catalyst for changes: enforcement and exercise of copyright get a different meaning and impact. Two examples of technology-inspired changes are described below. The ITV-TVCatchup case illustrates how copyright creates barriers to platform independent consumption of works.<sup>19</sup> The American ReDigi-case<sup>20</sup> and the European UsedSoft cases address the barrier of not being able to sell and buy ‘pre-owned’ digital works.

#### 2.3.1. Platform independent consumption and copyright

TVCatchup (hereinafter TVC) offers an Internet television broadcasting service. The service allows its users to watch via the Internet ‘live’ streams of free to air television broadcasts. The service is only delivered to users who are already entitled to view the broadcasts because of their British Television Licence. Moreover, the service can only be used in the United Kingdom. TVC technically can authenticate the user’s location and refuse access where the conditions are not met.

ITV and a number of other broadcasters hold the copyrights in the television broadcasts, films and other items included in the broadcasts. They claim that TVC with its service infringes their rights in the broadcasts, more specifically the right of communication to the public.

The CJEU interpreting the EU Directive on Copyright in the Information Society (hereinafter InfoSoc Directive) ruled that ‘each transmission or

<sup>19</sup>Case C-607/11 *ITV Broadcasting Ltd and other companies v TV Catchup Ltd* [2013] 3 CMLR 1, <http://curia.europa.eu/juris/document/document.jsf?text=&docid=134604&pageIndex=0&doclang=EN&mode=lst&dir=&occ=first&part=1&cid=365334>

<sup>20</sup>*Capitol Records LLC v ReDigi Inc*, 934 F Supp 2d 640 – District Court, SD New York 2013.

retransmission of a work which uses a specific technical means must, as a rule, be individually authorised by the author of the work in question'. The CJEU then considered many kinds of additional circumstances, but none of these could detract from the conclusion that there was a separate communication to the public for which a separate authorisation is needed.

We perceive the law here as a barrier to users of a different platform. Somebody who is watching a TV programme via the Internet is not likely to view it also on his television. The use that a consumer makes is therefore not more intense than would have been the case had the consumer only had a television. Nonetheless, the ruling indicates that the rights holder should be asked for permission twice and perhaps this may lead to the rights holder being rewarded twice. The point is that copyright attaches to the technology: technically there are more channels, but for the user they perform the same function. What is lacking is a technology independent conceptualisation of exploitation of copyrighted works. As a consequence the user must negotiate a financial barrier if he wants to make use of different platforms to view TV programmes.

At much the same time, a case was brought before the US Supreme Court that is to some extent the mirror image of the TVC case.<sup>21</sup> Aereo offered a service for watching (and time shifting) aired TV programmes via the Internet. Its service might be characterised as allowing a customer to receive and record a TV programme at a distance. Aereo had multiple antennas and centralised server space. When a customer indicated that he wanted to watch (or record) a TV programme, one antenna and individualised server space was allocated to the customer. The signal received by the antenna and stored on the server would only be used for this customer and not for other customers, even if they watched the same programme. So technically, it was the customer who received and recorded and Aereo only provided the technical facilities to do so. However, here the Supreme Court held that Aereo was infringing the copyrights in the TV programmes. It argued that Aereo's service did not in relevant aspects differ from Cable TV and that Congress had brought the act of providing Cable TV under the Copyright Act. Telling is the following sentence from the synopsis of the decision: 'Viewed in terms of Congress' regulatory objectives, these behind-the-scenes technological differences do not distinguish Aereo's system from cable systems, which do perform publicly.' So, here it can be observed that the Court looks through the technical reality. Obviously, rights holders need to be compensated for the exploitation of their works, but it can be questioned whether the creation of multiple 'pay moments' is in line with the view that users in essence enjoy one and the same

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<sup>21</sup>*American Broadcasting Companies v Aereo*, 573 US (2014), [www.supremecourt.gov/opinions/13pdf/13-461\\_1537.pdf](http://www.supremecourt.gov/opinions/13pdf/13-461_1537.pdf). See also Pamela Samuelson, 'Watching Television on Internet-Connected Devices' (2014), 57(7) *Communications of the Association for Computing Machinery* 22.

service. Here too, a better regulatory job could be imagined. From the perspective of the user, there is a financial barrier.

### **2.3.2. Copyright and property: the exhaustion discussion**

The concept of exhaustion plays a central role in the discussion about a second-hand market for digital works. Copyright exhaustion is the principle that with a first sale by the rights holder (or with his authorisation) the distribution right of the rights holder with respect to the sold copy is exhausted. The buyer is free to sell his copy on the 'second-hand market'. Traditionally, the term 'copy' is understood to refer to a physical copy, ie a physical carrier in which the work is fixed. Exhaustion is the instrument that the law uses to reconcile the interests of the owner of the physical object with the interests of the copyright holder of the work that is fixed in the object. In the EU, exhaustion also has the function of reconciling copyright with the free flow of goods within the internal market. Traditionally, exhaustion did not involve reproduction of the work. With the second hand sale of a book, a CD or a DVD, a single copy simply changed hands, no reproduction being necessary. This had a legal implication, viz exhaustion of the reproduction right was not needed and it had a factual consequence: the impact on the market for the work was limited. Only copies first sold 'by' the rights holder were available for the second-hand market. Additionally, the quality of these copies may over time have deteriorated, thus further limiting the effect on the market for 'new copies'.

The American ReDigi case addresses the question whether exhaustion can be applied to digital music files downloaded from a server.<sup>22</sup> ReDigi had a service that allowed users to sell music files they had purchased on iTunes. In order to do so, a user had to download and install a program called 'Media manager'. This program searched a user's computer and attached devices for iTunes files that were eligible for sale. After having checked the files found were legitimate iTunes files, these files could be uploaded to ReDigi's server, called the 'Cloud Locker'. The uploaded files should then be deleted from the user's computer. From the court ruling, it is not completely clear whether Media Manager deletes the files itself or whether Media Manager merely prompts the user to delete the files. Media Manager does however continuously check the user's computer for the presence of iTunes files that should no longer be there. Once uploaded, the user could use the files by streaming them to his computer or offer them for sale. If and when a sale occurs, the user can no longer stream the sold file and, if all is well, all copies will have been deleted from the user's computer.

Capitol Records LLC sued ReDigi for copyright infringement. ReDigi relied on the first sale defence. The court did not agree with ReDigi. First, the court

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<sup>22</sup>Capitol Records LLC v ReDigi Inc, 934 F Supp 2d 640 - District Court, SD New York 2013.

found that uploading the file to the Cloud Locker constituted a reproduction even though the files were deleted from their original location: ‘Simply put, it is the creation of a *new* material object and not an *additional* material object that defines the reproduction right.’<sup>23</sup> This finding kicked the foundation under ReDigi’s first sale defence away. The copies sold on ReDigi were not the phono records created when the user purchased and downloaded the song from iTunes to his hard disk. They were in fact reproductions and moreover reproductions not ‘lawfully made’ as required under the American first sale defence. The court was however not completely insensitive to ReDigi’s arguments, but it did not think a court was the institution best suited to change the present law. The court found that it should defer to Congress whenever there is a major technical innovation that alters the market for copyrighted materials: ‘Congress has the constitutional authority and the institutional ability to accommodate fully the varied permutations of competing interests that are inevitably implicated by such new technology’.<sup>24</sup>

In contrast, the CJEU in the *UsedSoft* case judging about the exhaustion of rights in database software apparently saw no reason for such deference to the legislator.<sup>25</sup>

Oracle distributes its copyrighted database software by *inter alia* offering it for download. The licence that goes with the software states that it is non-transferable and that it is for an unlimited period. Oracle’s group licences are for 25 users. Therefore, a company that for example has 29 users must acquire two licences. *UsedSoft* acquires complete licences from customers of Oracle and partial licenses for the part that the original acquirer does not need because his real number of users is less than 25 or 50 or 75 etc. *UsedSoft* resells the used licences to its customers. Customers who are not yet in possession of the software download the software directly from Oracle’s website. Oracle sued *Usedsoft* before the Munich court and sought and got an injunction against *UsedSoft*. This injunction was upheld on appeal whereupon *UsedSoft* appealed to the Federal Court (*Bundesgerichtshof*). The Federal Court referred to the CJEU for a preliminary ruling, seeking clarification on the right of the lawful acquirer to make a copy of software (Article 5(1) of the Software Directive) and on exhaustion (Article 4 of the Software Directive).

The CJEU addressed the issue of exhaustion first. Exhaustion requires a first sale, ie a transfer of ownership of a copy. The CJEU found that even in case of a download there was a transfer of ownership. It based this finding on two arguments. First, a download and the conclusion of licence agreement cannot be separated, but should be seen as an indivisible whole. Second, the

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<sup>23</sup>*ibid* 6.

<sup>24</sup>*ibid* 17.

<sup>25</sup>Case C-128/11 *Usedsoft GmbH v Oracle International Corp* [2012] 3 CMLR 44, [2012] ECDR 19 and [2013] RPC 6.

right to use granted in the licence was for an unlimited period, against a fee that is a remuneration corresponding to the economic value of the copy. On the basis of these arguments, the court found a transfer of ownership. Therewith, a first hurdle with respect to exhaustion was taken. The second hurdle relates to the effect of exhaustion: the distribution right is exhausted. However, is a download from a server a form of distribution? Traditionally, you might characterise a download rather as a communication to the public (and not as a distribution). The CJEU however found that a transfer of ownership changes a communication to the public into a distribution. A final hurdle concerned the intangible character of software downloaded from a server. Does exhaustion apply to ‘intangible’ copies? The court did away with this hurdle by finding that Directive 2009/24 (as a *lex specialis* about protection of software against the general InfoSoc Directive) makes no distinction between tangible and intangible copies. However, the special character of intangible software necessitated two additional conditions to be observed: first, the reseller must make its own copy unusable. Second, the reseller cannot split up a licence for multiple users. These findings cleared the way for the reseller.

But what about the buyer of used software? He still had to download it from Oracle and that amounts to a reproduction. Was this covered by Article 5(1) Software Directive that provides a defence to the lawful acquirer of software who makes a copy that is necessary for the use of the computer program in accordance with its intended purpose? Holding that distribution would be meaningless if the rights holder could block downloads the CJEU declared Article 5(1) applicable to the second-hand buyer downloading the software. Therewith, the road was cleared for UsedSoft to continue its business with the exception that it could no longer resell partial licenses.<sup>26</sup>

For a long time, the view has been that hard copies and ‘non material’ copies are truly different things. Allowing exhaustion for non-material copies would undermine the position of the rights holder. He would be unable to check whether the seller of a copy truly disabled his copy. Given that this would be hard or even impossible to check, the application of exhaustion to non-material copies was seen as a risk that the rights holder should not be subjected to. However, the views are shifting, in Europe, for the time being only for software, and not for other works.<sup>27</sup> The court refers in several places

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<sup>26</sup>A nuance may need to be made. The German Bundesgerichtshof suggested that splitting up a licence is not allowed in case of client-server software, but may be allowed for stand-alone software. For client-server software splitting leads to multiple server-side copies being installed, thus enlarging the number of copies beyond what was contemplated by the rights holder when giving the licence. BGH 17 July 2013, I ZR 129/08, Usedsoft II, at 65. Available at (in German): [www.telemedicus.info/urteile/Urheberrecht/1435-BGH-Az-I-ZR-12908-Weitervertrieb-gebrauchter-Softwareizenzen-Usedsoft-II.html](http://www.telemedicus.info/urteile/Urheberrecht/1435-BGH-Az-I-ZR-12908-Weitervertrieb-gebrauchter-Softwareizenzen-Usedsoft-II.html)

<sup>27</sup>A small caveat may be in order. A Dutch Court has refused preliminary relief against a seller of second-hand e-books. Within the confines of a procedure for preliminary relief the Court could not establish with certainty that the UsedSoft ruling by the EU Court of Justice was not applicable to e-books. Source:

to the software directive as a *lex specialis* vis-à-vis the general InfoSoc Directive. In the US, one court is not totally unsympathetic towards the reseller, but thinks it is a task for Congress to take the necessary steps (if it deems them desirable). It is not completely clear why this shift is occurring now. There could be a shift towards an attitude that is less rights-holder-friendly, deeming risks now acceptable that were still unacceptable a few years ago. It could also be that there is trust in technology. The shift creates a market for technology that can check whether the reseller disables his copy and maybe the expectation has won terrain that this technology will work in an acceptable and adequate way. Or is it simply that these types of cases are only now reaching the courts? For a long time, there was no legitimate supply of 'new' downloadable music that was worth mentioning. Without legitimate 'new' supply the issue of 'legal' reselling simply cannot arise.

However, let us not overstate what is happening. In the US, Congress has not taken steps and let us remember that in Europe this is only limited to software and an important part of UsedSoft's market is taken away by the holding that partial licences cannot be resold.<sup>28</sup>

Economically, downloading software has taken the place of the purchase of a physical copy of the software. The lack of a physical carrier excludes – in the traditional legal view – exhaustion, so that resale of software came under the control of the copyright holder. From an economic perspective, this creates a barrier for the software user who now cannot resell his software.<sup>29</sup> The CJEU has attempted to (partially) lift this barrier. However, it is not completely clear whether it has succeeded in doing so. It is claimed that the software industry can easily evade the decision, either by offering software with a temporary licence or by switching to a Software-as-a-Service model.<sup>30</sup> In the latter case, the software user never receives any code. However, it should not be assumed that courts will accept temporary licences that are obvious attempts to evade the UsedSoft decision. It is also not clear whether users of software will accept a switch to a SaaS model.<sup>31</sup> Finally, there may be software companies that have an interest in a second-hand market in software. If they derive substantial income from maintenance, integration, customisation or user training, a secondary market may actually be positive for these companies.

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Voorzieningenrechter Amsterdam 21 July 2014 ECLI 2014.4360, NUV/Tom Kabinet, <http://uitspraken.rechtspraak.nl/inziendocument?id=ECLI:NL:RBAMS:2014:4360> (in Dutch).

<sup>28</sup>Bernt Hugenholtz, 'Noot onder HvJEU 3 juli 2012, zaak C-128/11 (UsedSoft/Oracle International)' (2013) 103(118) *Nederlandse Jurisprudentie*, 1337, 1348–49.

<sup>29</sup>Riehl and Kassim expect for the US that without a digital first sale doctrine a future lays ahead that is 'ostensibly governed' by licences: see Damien Riehl and Jumi Kassim, 'Is "Buying" Digital Content Just "Renting" for Life? Contemplating a Digital First-Sale Doctrine' (2014) 40(2) *William Mitchell Law Review* 783, 812.

<sup>30</sup>Hugenholtz (n 29) 1348–49.

<sup>31</sup>Asay indicates that technological patrons (eg large distributors) may claim certain rights back for the benefit of consumers, but indicates that this is only piecemeal: see Clark Asay, 'Copyright's Technological Interdependencies' (2015) 18(2) *Stanford Technology Law Review* 189, 213–18.

Moreover, if software users are able to sell old software, this may give them also more buying power to invest in new software. This serves to show that it is not so easy to estimate what effect a regulatory intervention has on a barrier and whether it is successful in removing a barrier.

#### 2.4. Geo location technology on the Internet

Geo-location technologies allow the determination of the approximate location of an Internet user. Using the technologies, a website can find out the approximate location of its visitors. The technologies have progressed so far that with a reasonable degree of accuracy the country and even the city where an Internet-user is can be determined.

Jurisdiction on the Internet is not ubiquitous, but it is not too difficult to establish jurisdiction. In Europe, the effect rule establishes jurisdiction where a website has effects.<sup>32</sup> This rule holds for example for breaches of personality rights and copyright infringements. This potentially exposes companies to large legal risks. They may be summoned to a court in any EU Member State where the website is accessible. For other cases, such as infringements of registered IP rights, an additional connecting factor is required, such as an intention to target.

The application of the effects rule to copyright is the result of the recent *Pinckney* case of the CJEU.<sup>33</sup> This case concerns jurisdiction in cases of copyright infringement in an online environment: CDs with copyrighted music were distributed through an Internet website. The question was whether a court in a territory where the content has been accessible has jurisdiction or only a court in a territory at which the content had been directed. Article 7(2) of Regulation 1215/2012 states: ‘A person domiciled in a Member State may, in another Member State, be sued: ... (3) in matters relating to tort, delict or quasi-delict, in the courts for the place where the harmful event occurred or may occur’. In earlier case law,<sup>34</sup> the CJEU had limited the effect of Article 7(2) by considering the ‘intention to target’. In *Pinckney*, this was abandoned. The CJEU decided that a court has jurisdiction ‘if the Member State in which that court is situated protects the copyrights relied on by the plaintiff and that the harmful event alleged may occur within the jurisdiction of the court’.<sup>35</sup> As a consequence, it becomes easier to find jurisdiction in copyright cases. The CJEU has confirmed the *Pinckney*-line in the

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<sup>32</sup>See art 7(2) Regulation (EU) No 1215/2012 of the European Parliament and of the Council of 12 December 2012 on jurisdiction and the recognition and enforcement of judgments in civil and commercial matters (recast), L 351/1, 20 December 2012.

<sup>33</sup>*Pinckney v KDG MediaTech AG* (C-170/12) [2013] Bus LR 1313 (ECJ (4th Chamber)).

<sup>34</sup>Joined Cases C-585/08 and C-144/09 *Peter Pammer and Hotel Alpenhof* [2010] ECR I-12527, Case C-5/11 *Titus Donner* ECLI:EU:C:2012:472 (not reported), and Case C-173/11 *Football Dataco Ltd v Sportradar GmbH* [2013] 1 CMLR (29) 903 (ECJ).

<sup>35</sup>*Pinckney v KDG MediaTech AG* (C-170/12) [2013] Bus LR 1313 (ECJ (4th Chamber)), [43].



Pez Hejduk case.<sup>36</sup> However, it has indicated that the court seized can only rule on the damage suffered in the Member State where the court is situated.

The use of geo location technologies is on the rise. Companies and organisations become aware of the risks of jurisdiction on the Internet and are looking for means to address the risk.<sup>37</sup> Geo location technologies are very useful for this purpose. They can be used to target certain jurisdictions only or to exclude certain jurisdictions. Even though the technologies may not function perfectly, the technical exclusion or non-inclusion of a jurisdiction may be expected to provide important arguments in a legal dispute over jurisdiction.

Moreover, the use of geo location technologies may become obligatory. The somewhat older case *LICRA & UEJF v Yahoo!* is an example.<sup>38</sup> Internet users in French territories could either directly or through a link from Yahoo!'s French subsidiary, view the pages, services and sites of yahoo.com. Amongst these was an auction service where inter alia Nazi memorabilia were sold. Such display of Nazi objects is a contravention of French law. By allowing the display in French territories and the possible participation of French Internet users in such auctions, the Ligue contre le racisme et l'antisémitisme (hereinafter LICRA) and the Union des étudiants juifs de France (hereinafter UEJF) suffered damages in France. The French court seized upon this fact to rule it had jurisdiction to hear the case. Yahoo! contended that it could not control the access to its auction services and as a consequence could not prohibit Internet users in France from displaying the disputed pages on their screens. The French court disagreed and found that Yahoo! could identify Internet users from France by looking at their IP addresses and prohibit them from displaying the pages on their screens. The court did recognise that where Internet users make use of services to hide their identities Yahoo had little control apart from systematically refusing access to such sites to users who hide their geographical origin. This led the court to the conclusion that although there were real difficulties, they were not insurmountable. Yahoo! was ordered to take all the necessary measures to discourage and disable Internet users in France from displaying the sites and services at issue on their screens.

Geo location technology is a barrier in that it partitions the Internet into sections where some users have access and others not. Geo location technology is a barrier with two faces.

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<sup>36</sup>Case C-441/13, *Pez Hejduk v EnergieAgentur NRW GmbH* [2015] Bus LR 560, [2015] ECDR 10.

<sup>37</sup>Tracie Wandell, 'Geolocation and Jurisdiction. From Purposeful Availment to Avoidance and Targeting on the Internet' (2011) 16(2) *Journal of Technology, Law and Policy*, 275, 296.

<sup>38</sup>TGI Paris, ordonnance de référé, 22 May 2000, Comm. com. électr.2000. comm. n°92, annotation J-Chr. Galloux, UEJF et Licra c v Yahoo! Inc et Yahoo France, [www.legalis.net/spip.php?page=jurisprudence-decision&id\\_article=175](http://www.legalis.net/spip.php?page=jurisprudence-decision&id_article=175)

On the one hand, there are many nations in the world with their own cultures and jurisdictions. Geo location technology does allow a party to have a presence on the web and tailor its geographical reach to the demands of different jurisdictions thus channelling the risk of being sued before a foreign court.<sup>39</sup> In the absence of technologies allowing the tailoring of geographical or jurisdictional reach there is theoretically the risk of a race to the top: web presences orient themselves towards the jurisdiction that has the strictest rules, for example on forbidden speech.

On the other hand, the use of the technology to ex- or include jurisdictions diminishes network effects on the Internet. The Internet derives its value from it being accessible by everybody, wherever he or she may be. Geo location technology reduces network effects by excluding certain geographical areas. The pertinent service is not available for whoever is in an excluded (or not-included) area. This reduction in network effects is accelerated by a number of additional circumstances. First, the use of geo location technology may become (or perhaps already is) mandatory. The Yahoo case indicates that its use can have a mandatory character, although it is not clear to what extent.<sup>40</sup> Second, there is a cost element. Cost is concerned in that it is not a sinecure to check the legality of a web presence according to many jurisdictions.<sup>41</sup> Therefore, the use of geo location technology will probably be mainly of a reactive nature: where jurisdictions particularly stress that they value compliance with specific, extraordinary rules geo location technology will be used. Even then, it may be a burden to comply with the demands and perhaps jurisdictions may be excluded as a preventive measure, if it is uncertain whether a web presence complies with the laws of the jurisdiction, but where a complete compliance check is considered too expensive. Third, there is a legal barrier that can be understood as follows: the existence of geo location technology forces companies and organisations to think about and be more specific about what jurisdictions they serve. That is in itself good, but the question is whether this might backfire. For example, a company excludes a limited number of countries from viewing its website. This could be used as an argument that all other countries are included, even if the company does not do business with many of them in the normal course of its work. In a dispute about jurisdiction, obviously more elements play a role than the technical reality geo location technologies create. However, non-exclusion of a country where other countries have been excluded remains a strong argument in the hands of the company's

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<sup>39</sup>Kevin King, 'Geolocation and Federalism on the Internet: Cutting Internet Gambling's Gordian Knot' (2010) 11 *Columbia Science and Technology Law Review* 41, 44.

<sup>40</sup>It is unclear to what extent a country-lens approach would satisfy a duty to block. For the country-lens approach, see Dan Jerker Svantesson, 'Delineating the Reach of Internet Intermediaries' Content Blocking: "ccTLD Blocking", "Strict Geo-location Blocking" or a "Country Lens Approach"? (2014) 11(2) *SCRIPTed* 153, 165–68, <http://script-ed.org/?p=1539>

<sup>41</sup>This is an even bigger problem for individuals and small companies and organisations.

opponent. The question is whether the use or non-use of the technology in jurisdictional disputes might cause a bigger problem than it solves. Will the technology give rise to a cautious approach and many preventive exclusions or even worse, a limited list of inclusions? Non-use of the technology may no longer be an option after Yahoo!

We of course do not know to what extent geo location technologies will be used. We also do not know exactly how private international law will deal with geo location technology. However, there is a risk. The existence of technologies to exclude jurisdictions could have a strong normative effect: the technology to exclude exists, therefore you should use it. If you do not exclude a jurisdiction, you do so at your own risk. The combination of this normative effect with the *Pinckney* decision that does away with the intention-to-target could give rise to a dangerous development: preventive, far-reaching exclusions of territories to the detriment of Internet network-effects. A technology that at first sight seems to give greater control over the action radius of web activities, may in the end have detrimental effects on the Internet as a whole and become a formidable barrier to the free flow of bits over the Internet.

### 3. Analysis

The cases above show that new technologies and their reception in regulation can give rise to unintended barriers that affect the public interest. This article contends that this is a cause for concern. Thereto, the next subsection argues that the occurrence of worrisome barriers is not restricted to the cases described but is a broader phenomenon. This also explains why there is a role for lawmakers. The second section argues that lawmakers currently fail to take account of barriers.

#### 3.1. Public interest

The four cases described illustrate barriers that harm public interests. In the Monsanto case, beneficial types of innovation – slow, farm-scale genetic modification and biological farming – were discouraged. The NSA case concerned the freedom of association and the knock-on effects of an impediment to this freedom on free speech. Advocacy groups traditionally have an important role to play in maintaining a viable public discussion. In the ReDigi case, the issue of tradability of downloaded items was at stake. The new distribution technology threatened to affect negatively the position of consumers to the benefit of companies that are partially shielded from competition, to the detriment of market efficiency. Geo Location Technology affected the benefits of an open Internet and its concomitant network effects. The public interests

involved in the cases derive from a broad range: from purely economic and innovation-related to political and intellectual interests.

The fact that barriers affected the public interest in the four described cases, in itself, does not imply that this is a phenomenon that occurs more often. The effects may be specific for the cases. Nevertheless, the question is relevant because a broader effect not limited to the four cases would be a strong argument for contending that lawmakers should be more attentive to barriers as meant in this article. To get a better insight into the broader applicability of the phenomenon, it is worthwhile to go back to the criteria on the basis of which the cases were selected. The selection criteria indicate in what type of cases we are interested and thus give insight into the general characteristics of these cases. The following picture emerges. We are interested in cases in which a technology in unison with regulation gives rise to barriers. In the first instance, we are interested in whether the behaviour affected by the barrier is existing, or new, technology-mediated behaviour. Furthermore, the cases are characterised by the novelty of the technology involved encompassing both technology that is the functional equivalent of pre-existing technology and technology that is completely novel and has no traditional analogue. The question then is whether these characteristics imply an increased risk relative to the public interest and if so, under what additional conditions. The characteristics paint the following picture. Hereinafter, barriers to existing behaviour, to new behaviour, caused by functional equivalent and functional non-equivalent technology are examined.

If technology in unison with regulation raises a barrier to existing behaviour, the barrier affects behaviour that most probably always has been possible. If this behaviour has merit and the technology has not made the old behaviour functionally superfluous, there is reason to verify whether the existing behaviour has enough breathing space alongside the new technology. A barrier to the existing behaviour may not be necessary under these circumstances.

If technology in unison with regulation raises a barrier against 'new' behaviour, a lawmaker may ask himself why technology and regulation enable new behaviour and then immediately limit the very same behaviour again. This is especially pertinent if there is a good reason not to limit the behaviour. Is the barrier in these circumstances really necessary?

If a barrier is raised by a technology that is the functional equivalent of an old technology, it may very well fall in the same normative framework as the existing technology. Therefore, if the existing normative framework is still *grosso modo* applicable, why should it lead to a different assessment about the barred, limited or discouraged behaviour? A reason could be that the new technology differs enough from the existing to warrant differential treatment, but this is something that requires verification.

If a disruptive technology creates a barrier, it is probably unclear which normative framework needs to be applied. A disruptive technology as understood in this article fulfils a function that in its form is new. Therefore, the use of the technology may be relevant under multiple pre-existing normative frameworks. It may not be possible to determine the necessity of the barrier unambiguously. Given the overall uncertainty, a lawmaker has to look critically at the barrier. This is not an easy task, since it may involve devising a normative framework for the new technology.

In many cases of barriers, there is reason to ask critical questions and not just in the four cases that have been described in this article. This task falls on lawmakers since the developers or primary users of the technology often do not have an interest in resolving the barrier. For them it is an externality. For example, it does not cost Monsanto anything if the life of biological farmers becomes more difficult. Those affected by the barrier need recourse to the law to change their situation, especially if they cannot influence the course of technology development (which usually is the case). Hence, it falls on the lawmakers to provide protection for these interests.

### ***3.2. Why do lawmakers fail to prevent barriers?***

If lawmakers have to take barriers on board, it is foremost relevant that they identify barriers. This is however not so easy. Sometimes, it is difficult to see how a new technology affects private and public interests. Hence, it may be unclear that there is a barrier at all. For example, a lawmaker may think that farmers who decide not to use GM seed can simply choose not to use them. What would stop them from staying 'biological'? Metadata collection by NSA may be thought to have no chilling effects, especially if it happens secretly. Why would members of advocacy groups feel inhibited? In other cases, it may be clear that people cannot do certain things but it is not clear that that is a problem. It requires argumentation to see why the barrier needs the lawmaker's attention. For example in the ReDigi case, it is clear that a consumer cannot sell downloaded content on the second-hand market, but it is not so clear why that is a problem. Exhaustion has never extended to content made available on the Internet, so why should second-hand sale now be made possible? Likewise, in the Geo-Location-Technology case, it is clear that there is a barrier: when this technology is used, websites cannot be visited from certain locations. However, that is seen as a good thing; it limits the website manager's exposure to legal claims. More geographical control is progress. Hence, inhibitions are not identified as barriers that need the care and attention of a lawmaker.

Hence, identification of a barrier by a lawmaker sometimes requires empirical insight (is there actually a barrier?) and at other times, a value judgement (is the barrier actually detrimental?). Even, if a barrier is foreseen (as

for example the Federal Court of Appeal did in *Monsanto v Schmeiser*) then it is difficult to see whether that which theoretically is a barrier will actually develop into a practical problem. Therefore, a lawmaker may decide to leave the situation as it is in the expectation that those affected by a barrier will call attention to their situation if needed.

In an ideal world, lawmakers would address the issue before a barrier arises, but this will probably not happen in the real world. It is more likely that resolution of barriers is dependent on those affected by a barrier making their concerns known. This indicates that it is critically important that legislators are open to signals from society. In addition, courts have a role in redressing barriers. Most cases that have been described above are derived from court cases where in one form or another a barrier was the object of contention. Therefore, access to justice is equally important. It is important that civil organisations are active in bringing interests forward.

#### **4. Conclusion**

This article draws attention to the phenomenon that new technology in its interplay with regulation may lead to unintended barriers to behaviour. These barriers may harm the public interest and may therefore require the attention of lawmakers. To illustrate these barriers and their effects, four cases have been described showing effects on a broad range of public interests: from purely economic and innovation-related to political and intellectual interests. That these effects can be observed in the four cases does not prove that the effects also occur in other cases. However, the general characteristics on the basis of which the cases have been selected suggest that the effects may be more general. These characteristics concern both the behaviour that is blocked, limited or discouraged, as well as the type of innovation that a technology has brought about. If, as suggested, the effects of barriers have a more universal character, lawmakers should pay more attention to technology-induced barriers and their effects. At the same time, it is observed that this is easier said than done. Barriers may be difficult to identify in advance. So, if there is to be adequate identification, this depends on signals from those affected by the barriers reaching lawmakers. Therefore, the extent to which lawmakers are receptive to signals from the field and access to justice become relevant.

#### **Disclosure statement**

No potential conflict of interest was reported by the author.

## Notes on contributor

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## Appendix

The table below locates the cases in a matrix. On the horizontal axis, the restricted types of behaviour are displayed: existing and novel behaviour. On the vertical axis, the technologies are displayed: functional equivalent and disruptive technologies.

	Displacing existing behaviour	Restricting novel behaviour
Functionally equivalent technologies	Monsanto-cases	–
Technologies going beyond functionally equivalent behaviour	First Unitarian Church of Los Angeles v NSA, and Geolocation Cases	UsedSoft and ReDigi cases