

Chapter 1

Regulating New Technologies in Times of Change



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Abstract This chapter provides an introduction to the overarching topic and question of this volume on how and whether to regulate new technologies in times of change. It introduces the regulating technology (development) model.

Keywords regulation · technology · innovation · Law of the Horse

1.1 Introduction

Let me start with looking back at an earlier point in my career. We had just survived the Millennium Bug and Internet was still written with a Capital I. In fact, the internet as we now know it was less than five years old. I was teaching in the

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department of Public Administration at Twente University. My courses dealt with law and ICT and IT and public governance. My students were really excited by the new opportunities offered by email and the World Wide Web. Social media did not yet exist, and online music and video were of low quality. Yet, my students saw the prospects of the emerging technologies and were eager to produce course papers about e-commerce and e-government. They had to focus on the legal aspects of these developments and many seemed to follow similar arguments: a new product or service is emerging, such as online shopping, this (type of) service is not mentioned in the law, hence we need new rules, new law. Law has to adapt to this new reality.¹ Oftentimes, this conclusion that the law needs to be updated as a result of new technologies was presented as obvious.² The argument, or rather the claim, put forward by my students was as follows: “We face a new technology, in this case the internet, or a service on the internet, such as e-commerce. The law is silent on these topics, which makes total sense because it is likely outdated and lawyers are old-fashioned anyway. Why? Well, let’s face it, the law is paper-based. Besides, it was developed for other circumstances and other phenomena and is created by people who don’t understand modern times. Hence, we almost certainly need new law, new rules.”

As I said, I was still young, knew little of technology law, and was a bit prone to following this line of reasoning. However, I was also sufficiently versed in traditional law to suspect flaws in their lines of reasoning.³ Maybe (surely) the legal system is flexible enough to cope with these, so-called, novelties. After all, how different is e-commerce from distance selling such as the kind based on catalogues? Why would ordering goods by telephone (or heaven forbid by fax) from a store be different to ordering stuff online? And yes, even in the old days, one could order goods from stores in other countries. Why would civil law, in particular contract law, not be applicable or be outdated? Why would the regulation pertaining to distance selling, which had been around for a while, not suffice? Why would concepts such as agreement, contract, default, tort, etc. not do? Should we not first explore whether they do, before jumping to the conclusion that we need new law?

With that harsh message and homework, my students went to the library and the drawing board in order to think-tank on the issues at hand and the adequacy of existing concepts and mechanisms.

¹ Not only students struggled with the fit of the normative framework to changing reality, also legislators around the globe pondered whether the online world requires new law (urgently). For The Netherlands, see Ministerie van Justitie 1997–1998. See also Koops et al. 2006.

² This may be a result of the engineering mindset of my students who had enrolled in a technical university.

³ I had read Frank Easterbrook’s lecture at the 1996 Cyberlaw conference entitled ‘Cyberspace and the Law of the Horse’, 1996 U Chi Legal F 207, which conveys the message that “the best way to learn the law applicable to specialized endeavors is to study general rules”.

1.2 Back to the Future

After my move to Tilburg University, I became more and more intrigued by the relation between technology and regulation. It will probably not surprise you that the patterns I observed in Twente also surfaced in Tilburg.⁴ Anytime a new technology materialises, or when innovators and entrepreneurs come up with a novel way of doing business, calls for regulatory changes can be heard. These voices do not only come from students and Ph.D. students, who by definition still have a lot to learn, but also from developers, engineers, policymakers, and the odd scientist, who may quickly arrive at the conclusion that there is a regulatory disconnect⁵ in need of fixing.

Many people seem to suffer from the ‘Flawed Law Syndrome’: the urge to call law or regulation outdated or flawed (disconnected) and the desire to fix the problems by addressing the law, rather than using other ways to mend the assumed gaps (‘Legal Solutionism’).

Of course, industry will also complain that the law needs to be changed.⁶ Industry typically brings forward two claims regarding the regulatory framework in their domain: one, that they are unduly constrained and two, that the rules are unclear. This seems to be the knee-jerk reaction every time a new technology emerges, rather than exploring the actual state of the art with respect to the technology and the law.⁷

We clearly see this ‘call-to-regulate’ reflex in the field of self-driving vehicles, where Google (currently Waymo), and the car industry more generally, call for regulation.⁸ A similar response can be seen with regard to “newish” ‘taxi-like’ services with human drivers, such as *Uber*, where a strong urge from the new services to regulate the field is visible.⁹ Of course, by regulating the field, they mean “in a manner that is to their advantage”. *Uber*’s concerns are different from Waymo’s, but the source of the issues is the same in both cases: there is a regulatory

⁴ So much for the hypothesis that the engineering mindset of students at a technical university was the cause of their legal solutionism. The term *Solutionism* was introduced by Morozov 2013a.

⁵ Brownsword 2008.

⁶ See, for instance, <http://www.drivingsales.com/news/google-and-auto-executives-urge-congress-to-develop-national-self-driving-car-regulations/>; <http://nhv.us/content/16024540-uber-urges-nh-lawmakers-introduce-statewide-regulations-ride>. Last accessed 23 October 2018.

⁷ Leenes et al. 2017 for an exploration of this phenomenon in the field of robotics.

⁸ See for calls in the US for instance, <http://www.drivingsales.com/news/google-and-auto-executives-urge-congress-to-develop-national-self-driving-car-regulations/>. Last accessed 23 October 2018; <https://collisionweek.com/2018/09/10/vehicle-manufacturers-suppliers-call-senate-passage-autonomous-vehicle-legislation/>. Last accessed 23 October 2018.

⁹ See, for instance, <http://nhv.us/content/16024540-uber-urges-nh-lawmakers-introduce-statewide-regulations-ride>. Last accessed 23 October 2018.

disconnect. To be fair, scientists are also unhappy and complain, for instance that killer drones should be banned.¹⁰

There is a steady pattern of calls for new regulation whenever new technologies enter the stage. However, if and when new regulation is introduced, the complaints often remain. To regulate means to weigh interests and the outcome of this process can hardly ever satisfy all. A prime example is data protection regulation. After four to five years of tough negotiations, comprising the various legislative stages, the European Parliament processed over 4000 amendments¹¹ to the original Commission proposal for a General Data Protection Regulation (“GDPR”) and new regulation was finally agreed on.¹² The internet giants have lobbied tremendously, but apparently did not get what they bargained for. Their dissatisfaction¹³ is not entirely surprising as Google and Facebook stand to lose a lot and have been in legal battles with the Data Protection Authorities based on the former Data Protection Directive 95/46/EC already.¹⁴

Let me return to the story and get back to the behaviour of industry in response to regulation later on. There seems to be a strong call for new regulation when a new technology presents itself. Some suggest a leap forward and claim that in a dynamic environment we need dynamic regulation, or flexible regulation. Certainly in the Netherlands, the road proposed is that of experimental regulation, such as sunset provisions, as a means of coping with uncertainty and offering flexibility.¹⁵

I am not particularly happy with this direction and will throw my head in the wind. Before doing so, I want to return to a story of old. Do we really need new regulation to cope with issues associated with new technologies, or are the classical instruments sufficient? I have mentioned Justice Frank Easterbrook’s take on this question already in a footnote, but will turn to his idea explicitly. Easterbrook’s target was the proposal by Lessig and others to create a new area of law, Cyberlaw.¹⁶ This idea of creating cyberlaw as a response to novelty (like cyberspace), is nonsense in Easterbrook’s opinion. He illustrates his point by explaining why there is no Law of the Horse and why we should not strive to create one. The

¹⁰ See, for instance, http://www.oxfordmartin.ox.ac.uk/news/201412_Robo-Wars. Last accessed 23 October 2018.

¹¹ For an overview of the 3132 amendments, see <https://lobbyplag.eu/map/amendments/libe/>. Last accessed 23 October 2018.

¹² The first COM proposal of the GDPR (2016/679) was published on 25 January 2012, it entered into force on 24 May 2016 and became directly applicable in all EU Member States on 25 May 2018.

¹³ See, for instance, <https://edri.org/edriagramnumber10-22facebook-doesnt-like-eu-regulation/>. Last accessed 23 October 2018.

¹⁴ Consider the cases launched by Max Schrems, see https://en.wikipedia.org/wiki/Max_Schrems. Last accessed 23 October 2018. See also <http://www.cnbc.com/2016/02/01/eu-privacy-rules-may-hit-internet-giants-hard.html>. Last accessed 23 October 2018.

¹⁵ E.g., Ranchordás 2014.

¹⁶ With this, Easterbrook started a long line of debate about Cyberlaw. One should in this line at least mention Lessig’s response, Lessig 1999; and Andrew Murray’s wonderful 2013 Bileta keynote: Murray 2013.

law of the horse is a metaphor for comprehensive regulation around all things horses. Whenever there is an issue involving a horse, the law of the horse is where to look for answers.

From a practical perspective there is significant challenge in creating such law, after all what are the potential topics to be addressed by this law? However, there may be merit in such an effort. On the positive side, having everything in a single act is convenient. At least as long as we can determine that we are dealing with a horse issue. That might be simple, you think, but what about the new invention of the Mule? Are they covered by the law of the horse? What about unicorns? Most certainly these are science fiction, but a quick glance at the Wikipedia entry on horse¹⁷ leads us to the realm of the Equids, with members such as the donkey, mountain zebra, plains zebra and crossbreeds such as the mule, hinny, jenny and zorse.

Of course all of this deals with the classification of events, facts, observations into legal categories, similar to the earlier e-commerce example. E-commerce might be a species of the genus contracting, just like a donkey is a species of the genus equus. Qualification and classification are tasks any legal scholar is trained in.

Having said that, in Easterbrook's view, the general legal concepts and mechanisms are flexible and can cope satisfactory with new phenomena. The criminal provisions regarding manslaughter do not distinguish between knives, guns and poison, they are simply means to accomplish death (in certain cases).

Before Easterbrook, legal philosopher Lon Fuller had a similar message when he wrote that good law is the law which is possible to obey.¹⁸ Legal compliance is probably easier to achieve with a limited set of general rules, rather than with a large set of specific rules for every new topic.

To stay with the law of the horse. Supposing that the law of the horse would exist, having a single set of rules applicable to all horse-likes would be preferable over a statute with specific rules for all horse-likes.

1.3 Regulating Technology

From the foregoing it is clear that we should be careful with interventions in technological development. Not so much because of phenomena such as Collingridge's dilemma—"When change is easy, the need for it cannot be foreseen; when the need for change is apparent, change has become expensive, difficult, and time-consuming,"¹⁹—but simply because of the old saying "if it ain't broke, don't fix it". All too easily we hear claims that the law is inadequate, without it being

¹⁷ <https://en.wikipedia.org/wiki/Horse>. Last accessed 23 October 2018.

¹⁸ Fuller 1969.

¹⁹ David Collingridge quoted in Morozov 2013b, p. 255.

clear what the actual regulation is or requires with respect to the technology in question.²⁰

We can observe that in domains like big data, where entrepreneurs and developers literally ask for establishing “Pirate Islands” with few or no rules where they can experiment without fear for fines. In robotics and many other domains the sirens of ‘Pirate Island’ and ‘Experimental zones’ can also be heard. These were, or are to be created to limit the scope or effects of rules that supposedly hamper innovation. When asked what rules actually hamper innovation,²¹ the silence is often deafening. The call for lessening the burden of rules seems related to the knee jerk reaction that new law is required to cope with technological innovation.

The fact that scientists do not know the rules that define their playing field while maintaining that they are constrained by them is problematic. For starters, *ignorantia juris non excusat* (“ignorance of the law excuses not”), and second, the law has normative force, the rules are supposed to be adhered to. To take an example out of a different, highly regulated domain, every professional cook is aware of the significant amount of rules applying to their business. Enforcement, including non-legal by TV shows like *GourmetPolice*, has helped raise awareness, and likely compliance.

Developers consider the law and legal and ethical requirements not for them, but for others and they happily muddle along as if they are unconstrained. That is, until corporate legal, or some supervisory authority or Media come into play. A recent example in this space is the Cambridge Analytica affair.²²

Of course it is not always easy to determine the applicable rules because the norms are abstract, they talk about products, services and not so much about household social robots. We always have to qualify everyday phenomena into the appropriate legal terms and interpret legal concepts and rules. And of course, there are also real tensions because existing regulation may have undesired effects, *lacunae*, or different legal regimes may lead to conflicting results. And not always should actors blindly follow the law. Sometimes the law really is outdated and requires change. But we need to look at things from the proper perspective and we have to keep in mind that different interests need to be balanced.

In my understanding,²³ there is an interaction between innovation/technological development, regulation and normative outlooks such as privacy and, autonomy. If one of the edges changes, then the other two do as well. Regulation could be

²⁰ See Leenes et al. 2017, p. 7.

²¹ One extreme example of a claim that rules are in the way of innovation is Consumer Technology Association President Gary Shapiro’s statement at a House Oversight Committee hearing on artificial intelligence that the GDPR is “going to kill people, because if you can’t transfer, for example, medical information from one hospital to another in the same region, that has life consequences.” <https://www.axios.com/gary-shapiro-gdpr-kill-people-1524083132-e3d317c0-7952-4a55-9c2d-c84d82dc03e7.html>. Last accessed 16 October 2018.

²² See the excellent Guardian dossier “the Cambridge Analytica Files” <https://www.theguardian.com/news/series/cambridge-analytica-files>. Last accessed 16 October 2018.

²³ This is one of the models that inspires our work at TILT.

adapted on the basis of technological development, but our (perception of) values may equally change. For instance Facebook's defining social interactions online seems to have affected how we appreciate privacy. The mutual-shaping perspective that is implied in this model, departs from the assumption that there is a fundamental interdependence between social, technological, and normative transformations. This interdependence exists in an ongoing process of socio-technological change that is dynamic and open-ended, and that occurs in the context of a specific time and place (Fig. 1.1).²⁴

Yet, as discussed earlier, regulation is commonly seen as an impediment to innovation. In the context of the GDPR, someone stated "... it's also going to kill people".²⁵ Now of course, this person had a particular stake in the debate (did I mention he is a lobbyist?), but the fear that regulation hampers technological development is prominent. What is interesting in this respect is that people rarely complain about gravity impeding innovation. Gravity is simply taken as a design constraint. Why the opposition against regulation, which in many cases simply can be taken as yet another constraint?²⁶

Whether regulation impedes innovation or is a necessary constraint that should be taken as it is depends amongst others on the context.

There is a difference between testing an autonomous vehicle (that is a big word for a car that is less than 10 cm long) that should be racing on a slot car race track and the kind of testing required to get vehicles like Tesla's self-driving cars on public roads. Teslas will have to be tested under realistic circumstances, and hence will have to drive on public roads. It simply does not matter it performs well on the test track. What does matter is that it will not hit unexpected obstacles, such as trucks.²⁷ A legal obstacle in this realm has been the Vienna Convention on Road Traffic. Article 8(1) of this convention requires that "[e]very moving vehicle or combination of vehicles shall have a driver."²⁸ Arguably, driver means human driver in this provision.²⁹ In the Tesla case, this legal obstacle is manageable. A Tesla has a driver behind the steering wheel and hence the car satisfies the conditions of Article 8 of the Vienna Convention. However, the future of self-driving vehicles will likely be one without steering wheels. The existing rules then have consequences. Either we ban self-driving vehicles from public roads through the enforcement of the national road traffic laws based on Article 8 of the Vienna Convention, or we change the regulation removing the requirement for a

²⁴ Boczkowski 2004, pp. 255–267.

²⁵ See n. 22.

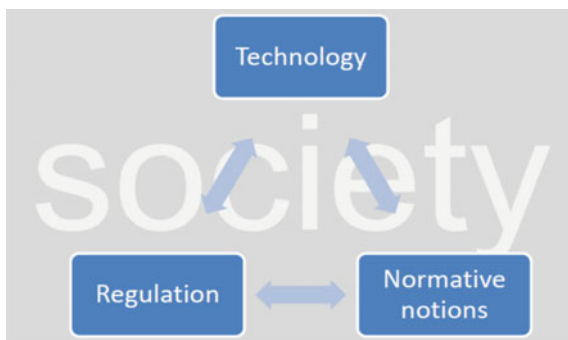
²⁶ Of course I know that regulation can be changed and gravity cannot, but still.

²⁷ See <https://www.theguardian.com/technology/2016/jun/30/tesla-autopilot-death-self-driving-car-elon-musk> for an account of the first time it became clear that the Tesla Autopilot was not ready in this respect, yet. Last accessed 17 October 2018.

²⁸ For more on regulating self-driving vehicles, see Leenes and Lucivero 2014.

²⁹ Article 1(v) of the Vienna Convention defines "driver as (v) "Driver" means any person who drives a motor vehicle or other vehicle (including a cycle), or who guides cattle, singly or in herds, or flocks, or draught, pack or saddle animals on a road".

Fig. 1.1 The interplay between regulation, technology development, and normative notions in the context of society. [Source The author]



driver to be physically present. At least, if we want these cars on the roads soon. This question is further addressed in Chap. 5 of this contribution.

This is where multiple interests come into play. Not everyone is convinced that we should cast aside all limitations in road traffic regulation to pave the way for driverless cars and some feel that we must resist the pressure from industry and developers. One of the reasons to be careful is that industry and large corporate players mobilise a strong lobby to get the rules they want (regulatory capture).³⁰ Maybe prudence should prevail over speed in terms of adaptation of the regulatory framework for self-driving vehicles produced by Waymo, Tesla, etc.

Legal action is required for other phenomena in the space of autonomous vehicles however. Not only the car industry (and interestingly enough Search engine giant Google (Waymo)) is racing to get a firm position in the market for autonomous vehicles, there is also a Do-it-yourself scene. Renowned iPhone and PlayStation hacker George Holz is eager to ship a 999 USD costing green box, called Comma One,³¹ which turns certain types of Hondas into cars with the same functionality as the Tesla S. Not quite a self-driving car, but it can drive quasi autonomously. I do not know how adventurous you are, but I am certainly not going to hand over control of my car to a small green box with significantly less computing power than my iPhone. In cases like these, I feel we need authorities that enforce the existing rules. Fortunately, the US National Highway Traffic Safety Administration agrees with me and has informed George Holz that he will have to comply with the safety requirements for motor vehicles.³² Is this hampering innovation or a necessary reminder of his responsibilities? I think the reminder that the norms are there to be observed was essential. George Holtz did not agree and to circumvent his liability and responsibility under the Motor Vehicle Safety Act, he posted the software and schematics of the green box on Github, facilitating the

³⁰ See Stigler 1971, pp. 3–21.

³¹ See <https://techcrunch.com/2016/09/13/comma-ai-will-ship-a-999-autonomous-driving-addon-by-the-end-of-this-year/>. Last accessed 17 October 2018.

³² See <https://www.scribd.com/document/329218929/2016-10-27-Special-Order-Directed-to-Comma-ai>. Last accessed 17 October 2018.

daring among us to try it out.³³ If you want to keep one lesson from this talk, then this is it: do not try this at home.

1.4 Connecting the Dots

Establishing that there is regulatory disconnect, such as in the case of the driver requirement for self-driving cars, or that the regulation contains lacunae is actually difficult. Nevertheless, it is a necessary step in the field of technology regulation. We cannot simply jump to the conclusion that we need new law, new rules.

In my teaching, I have used this work in progress model to illustrate the steps and some of the questions that need to be asked (Fig. 1.2).

Let me illustrate this by means of my simple Law Technology and Society (LTS) model. Moving through the model from left to right as I think we should be doing. Starting with (1) the technology. This step seems easy, but actually is not. There seem to be two conflicting approaches here. The start of the conversation might be an instance of a particular type of technology, let us take the well-known Google self-driving vehicles as an example. Then the discussion focusses on this very specific instance of the technology, or we move to the broad super-category of 'self-driving vehicles'.³⁴ Neither approach seems desirable. In the first we might focus on the potentially coincidental features of the technology that then determines how to proceed towards regulation,³⁵ in the latter case, the discussion runs the risk of becoming abstract and unhelpful because of the generalisation.

Lyria Bennett Moses³⁶ rightfully addresses the problem of addressing 'technology' as a regulatory target and instead calls attention for looking at the socio-technical landscape, which resembles my earlier call for a mutual shaping perspective. In this phase, taking a socio-technical lens we should determine what the technology of focus actually is, what its relevant characteristics are and which interests are at stake or are being promoted.

In the next stage (stage 2), the issues raised by the technological development are addressed. Here all sorts of distinctions can be made with respect to the issues. Are we talking about potential risks (autonomous vehicles may have to make decisions about whether to hit the child chasing a ball on our side of the road, or the elderly

³³ See <https://www.slashgear.com/comma-ai-self-driving-agent-open-sourced-after-comma-one-fail-01465892/> and <https://github.com/commaai/openpilot>. Last accessed 17 October 2018.

³⁴ Or take the other grand technologies of fame, such as nanotechnology, biotechnology, nanotechnology, etc.

³⁵ For instance, in the US the focus in developing self-driving vehicles seems to be on the autonomy of the car based on sensors in the car. In Europe there is much more attention for collaboration between the vehicle and its environment to establish the intended autonomy. See Leenes and Lucivero 2014 for more information on these differences in approach.

³⁶ Bennett Moses 2013.

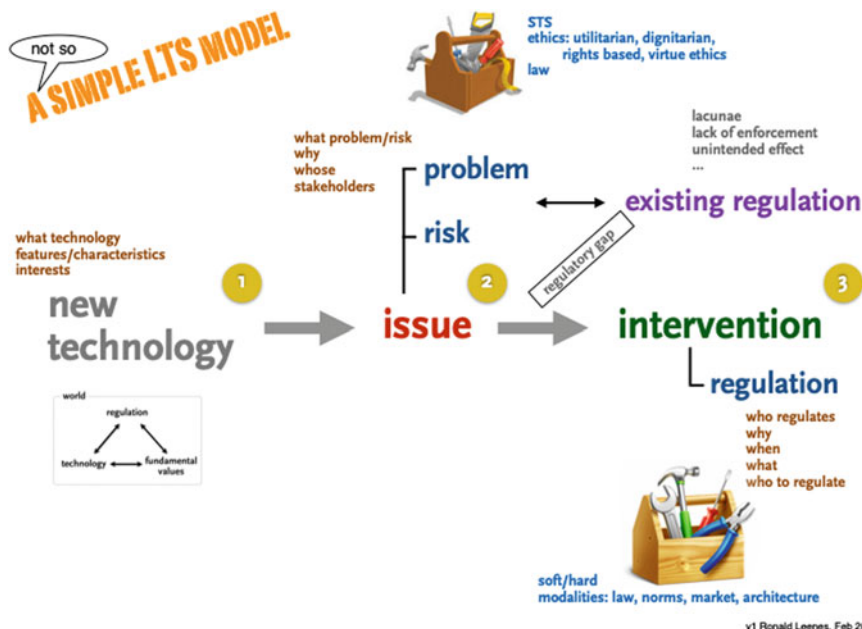


Fig. 1.2 The regulating technology (development) model v1. [Source The author]

couple crossing the street from the other side),³⁷ or are there manifest problems already (such as autonomous vehicles causing accidents on public roads). Again, the socio-technical context as well as the various stakeholders came into play. Who defines the problems or places topics on the agenda, who are the stakeholders anyway, etc.? At this stage, also the question that I have beaten to death so far, what does the current law have to say about this problem/technology comes into view.

Then if there is a regulatory gap, we might consider intervening (stage 3). Here, regulation comes into play. There appear to be three broadly accepted understandings of what ‘regulation’ is.³⁸ In the first, regulation is the promulgation of rules by government accompanied by mechanisms for monitoring and enforcement, usually assumed to be performed through a specialist public agency. The second assumes regulation to be any form of direct state intervention in the economy, whatever form that intervention might take. The third one takes regulation to be all mechanisms of social control or influence affecting all aspects of behaviour from whatever source, whether they are intentional or not. I subscribe to Julia Black’s decentred conceptualisation of regulation, which moves beyond the state as the sole regulator and which includes other modalities of regulation. Regulation, then, is ‘the sustained and focused attempt to alter the behaviour of others according to

³⁷ Think of Applied Trolley Problem here.

³⁸ Black 2002.

standards or goals with the intention of producing a broadly identified outcome or outcomes, which may involve mechanisms of standard-setting, information-gathering and behaviour-modification'.³⁹ In this stage, questions need to be raised who is to intervene, who (or what) to address, through which (combination of) means (e.g. law, norms, architecture, markets).

At all places in the model we need to ask critical questions. There are many tools that can help us in this respect.

Many of us (legal scholars), take for granted that we need regulation to cope with undesirable results of technology and innovation. But increasingly, I do not take that for granted and I become more sensitive to the position taken by economists and many American legal scholars that regulation is only permissible to address market failures, like unfair competition, windfalls etc. In Europe, we acknowledge that also protecting human rights (for instance privacy and data protection) and even furthering social goals such as solidarity are equally appropriate goals.⁴⁰ Yet, regulation should not be our first reflex. Ideally, we should not just regulate 'just because we can'. Lawyers too may suffer from hammer syndrome (nails everywhere)! Let the market handle things.

The regulator needs to justify that a problem fits within one of the three categories market failure, human rights protection, conflict resolution to warrant intervention. Interestingly, the box ticked then also provides some guidance as to how to regulate. For instance, in the case of *Uber*, one could argue that all sorts of costs (like insurance) are not incorporated into the price of the service and that *Uber* can therefore charge lower prices than traditional taxi services. To create a level playing field, *Uber* could be obliged to insure their drivers just like any (other) taxi service does. On the other hand, maybe the traditional taxi services are at the root of market failure here. Maybe the compulsory license system present in many cities is preventing newcomers entering the market and this issue should be addressed.

I close this part with a claim that determining regulatory disconnect/failure is difficult. I refer to our work on the cookie wars for a case study on what we consider to be an example of regulatory failure.⁴¹

1.5 Solutions

We will now briefly look at solutions. A suitable case to explore a little is self-driving vehicles. We do not know exactly yet what these will look like or what their requirements are with respect to the (road) infrastructure. Hence regulating these vehicles is not straightforward. We need flexibility. Does this mean

³⁹ Black 2002, p. 26; Black 2005.

⁴⁰ Prosser 2010, pp. 11–20.

⁴¹ Leenes and Kosta 2015; Leenes 2015.

experimental regulation or sunset provisions?⁴² I am not going into details what this means exactly because I think their names are self-explanatory.⁴³

The crux of both is that they are temporary measures, implying that they can be changed and thus provide for flexibility. This type of regulation provides legal certainty because there are rules. But this certainty is also (time) limited. We know that the rules may change in the case of experimental rules and we know that they may change or terminate at time T+1.

This is one way of coping with the flexibility required by innovation. There is another way of achieving flexibility. We can try to regulate behaviour by clear rules or by more abstract principles.⁴⁴ This distinction is not orthogonal to that of experimental versus fixed regulation, but merely addresses the form of the norms. Principles and rules are encountered all over the law. In (continental) civil law principles and concepts such as “reasonable” or “equitable” and in data protection we find calls for “appropriate” technical and organisational measures to be taken to ensure a level of security appropriate to the risk (Article 32 General Data Protection Regulation (GDPR)).⁴⁵ These vague and or open textured concepts are further developed in case law and handbooks. Yet, they are incredibly flexible and allow for new phenomena and risks to be incorporated or excluded over time.

On the other hand we have clear rules. The Dutch constitution contains a very clear provision in Article 13, which states that telegraph messages are secret (protected).⁴⁶ Which means something like communication by telegraph is protected communication. Telegraphs are out of fashion now, but referred to a clearly defined technology. The rule makes very clear what is protected but in a way turned out not to be future proof. The scope of communication secrecy was clearly defined in Article 13 of the Dutch Constitution: telegraph, telephone, letters. But then we got new communication technologies: fax, email, SMS. What about their protection? Strict/literal interpretation rules them out, teleological interpretation potentially not (all). Moving towards technology-neutral provisions⁴⁷ is a common solution to this kind of problems. Instead of mentioning the specific technologies (letter, telephone, telegraph), regulate communication. Instead of requiring a driver to be present to keep the vehicle under control, regulate that the vehicle must be safe for passengers and bystanders at all times. The notion of technology-neutral regulation is of course not new, but does change the discourse about regulatory approach.

⁴² Of course any regulation can be adapted, but if the regulation itself contains conditions for its review and change, actual adaptation is much easier because the review is automatically triggered, rather than requiring some actor to initiate it.

⁴³ See Ranchordás 2014 for an extensive account of the various concepts in this space.

⁴⁴ These are also called standards, which is kind of confusing because standards in the context of certification are actually quite precise. On regulation by rules and principles see Braithwaite 2002.

⁴⁵ Regulation (EU) 2016/679.

⁴⁶ In Dutch: “Het telegraafgeheim is onschendbaar.”

⁴⁷ See Koops 2006.

By the way, in practice, we also see counter examples. The previous Dutch minister of Traffic thought she could limit the number of lethal bicycle accidents by prohibiting people to use their smartphone while riding a bike.⁴⁸ The abstract provision that you have to be vigilant in traffic would thus be transformed into a very specific prohibition.

1.6 Conclusion

In this final section, I want to briefly touch on a few issues of technology regulation. There is, as you will have noticed, a clear issue with principle-based regulation and also with all types of experimental regulation. They imply legal uncertainty. We do not know yet what *appropriate* measures are under de GDPR. Time and courts will tell. Uncertainty is unavoidable in a highly dynamic environment. The law has (successfully) coped with this for thousands of years. But, there are also other issues we need to keep in mind.

An important one is regulatory capture. I mentioned this already in passing. Interested parties, industry at the forefront, will invest significantly in getting their way. In getting the regulation they want. See the net neutrality battle in the US.⁴⁹ Some are fully aware of this, for instance in the case where the consumer watchdog in the US called to withstand Google's pressure for swift regulation of autonomous vehicles.⁵⁰

Regulation is also a means to prevent newcomers to enter the market. *Uber* for instance claims that the traditional taxi companies have fostered a licensing system as a barrier to entry. Whether they are right is hard to tell as I already mentioned.

Another issue is that we should be aware that not all norm addressees are equal. Why do some people comply with the rules, while others do not? Kagan and Scholtz provide a useful distinction that we need to keep in mind.⁵¹ Amoral calculators make cost-benefit assessments and then determine whether they comply with the rules or not. The content of the rules does not matter, the fines do. A different group is that of the political citizens who do not follow certain rules as a matter of civil disobedience. And then there are the organisationally incompetent. These are the *ignorati*, they do not know or understand the rules. We need to be aware that all three types operate in the same space and we should not assume too easily that the rules are inadequate.

⁴⁸ <https://www.rtlnieuws.nl/editie/nl/bellen-of-appen-op-de-fiets-het-zou-verboden-moeten-worden>. Last accessed 17 October 2018.

⁴⁹ See, for instance, <https://www.politico.com/story/2015/02/net-neutrality-a-lobbying-bonanza-115385>. Last accessed 17 October 2018.

⁵⁰ See <http://www.bodyshopbusiness.com/consumer-watchdog-group-urges-california-dmv-to-ignore-pressure-from-google/>. Last accessed 17 October 2018.

⁵¹ Kagan and Scholtz 1984, p. 494.

The world of technological development and innovation is full of pioneers, but there are also pirates. We will have to cope with both.

And then there is one more thing. We live in the sharing economy. Maybe that is indeed the next big thing, but let us not forget that we are in uncharted territory with lots of promises that may not hold. The website *The Drive* had an interesting article in December 2016⁵² about the mobility bubble, with the compelling caption “When the Mobility Bubble Bursts, Which Companies Go ‘Pop’?” over an image of the burning Zeppelin Hindenburg in New York. *Uber* at that point in 2016 had lost 1.2 Billion USD per six months in 2016 without a clear business model. Do we really take experiments like these as guiding lights for new regulation?

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⁵² See <http://www.thedrive.com/tech/6491/when-the-mobility-bubble-bursts-which-companies-go-pop>. Last accessed 14 November 2018.

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