

Beyond IP Innovation Law: The Bigger Picture

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Introduction

Sustainable innovation law seeks to examine the interface between creativity, technology, society and law, beyond intellectual property (IP). Its study combines legal disciplines such as information law, cyberlaw, antitrust law, consumer protection law and the safeguarding of fundamental rights, with key Fourth Industrial Revolution (4IR) technologies such as artificial intelligence (AI), machine learning, big data, quantum computing, CRISPR-CAS and virtual reality (VR). An overarching principle of sustainable innovation law is that progress made must be ethical, social, beneficial to the economy, increase citizens well-being and support the environment.¹ That is what makes it sustainable.

IP is an important driver of innovation. But IP is not the only incentive & reward mechanism that spurs human creative or technical innovation.² Many alternative instruments, systems and methods that move knowledge production forward exist beyond IP, and its exclusive rights to use, reproduce and publish relevant subject matter.³ Examples are competitions, prizes, subsidies, grants, fines, tort law, market regulation (access/opening & barriers/restrictions), antitrust law, labor law (free movement & non-competes), commons-based production, education and R&D tax incentives.

Open innovation refers to a mindset of sharing knowledge.⁴ The term is associated with access, freedom to operate, combining thinking power, synergistic effects, sharing and building upon ideas, data donorship & patent pools, open source, digital commons and public domain.⁵ This openness contrasts with closed innovation, and its paradigms of secrecy, restriction and exclusivity. Open innovation is widely recognized to be beneficial for society and the common good.

In some cases, however, open innovation might not be the preferred policy choice. In that case, control needs to be built into the architecture of innovation.⁶ Exclusive rights might be required to make sure companies invest in R&D. In the form of patents⁷ and trade secrets.⁸ And sometimes,

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¹ The term also concerns democracy, rule of law, and human rights, see, Kop, 1 Transatlantic Antitrust and IPR Developments 35 (2021).

² Hemel/Ouellette, 92 Texas Law Review 303 (2013); Ouellette, Innovation Law Beyond IP 2 (2015).

³ Hemel/ Ouellette, 128 Yale Law Journal (2019);

Kop, Stanford Law School Projects, <https://law.stanford.edu/projects/beyond-ai-intellectual-property-regulating-disruptive-innovation-in-europe-and-the-united-states-a-comparative-analysis/>

⁴ Friesike/Widenmayer/Gassmann *et al.*, 40 J Technol Transf 581–601 (2015).

⁵ Frischmann/Madison/Strandburg, Oxford University Press (2014); Madison/Frischmann/ Strandburg, 95 Cornell Law Review 657 (2010). See also Benkler, Y. and Nissenbaum, H., 14 Journal of Political Philosophy, 394-419 (2006). <https://doi.org/10.1111/j.1467-9760.2006.00235.x>

⁶ Lessig, 51 Duke Law Journal 1783-1801 (2002).

⁷ Lemley/Burk, 89 Virginia Law Review 1575 (2003).

⁸ Price II, 91 Wash. L. Rev. 1769 (2016).

safety, societal or even existential risks outweigh the benefits associated with openness.⁹ Governments can then stifle innovation by restricting access to information. Restricting access makes discovery, invention and follow-on innovation harder.¹⁰ For instance, by utilizing state secrets or by imposing dual use regulations that prohibit trade of certain high-risk goods, technologies or applications,¹¹ such as quantum-resistant asymmetric cybersecurity algorithms.¹² Note that these are exceptions to the main rule that open innovation has to be encouraged in general.

Thus, policy makers should search for an innovation optimum that combines desired levels of openness and control, after a balanced assessment of private and public interests — including benefits & risks- involved.¹³ The public interest of a livable environment plays a leading role in all of this. A culture of collaborative, cross-disciplinary innovation will help to protect the planet we are living on and assist humanity in fighting climate change.

1. Artificial Intelligence & Intellectual Property Law

Back to intellectual property. Elsewhere I wrote that IP law should contribute to a legal framework that best serves the information to society while respecting fundamental rights and freedoms.¹⁴ As the infosphere develops and expands, legal rules and perceptions evolve as well. Take copyrights: these have to be reconstructed into a catalogue of well-structured economic rights, under which scientific progress is not hindered, and human creators (both authors and inventors) are able to make an honest living.¹⁵ Copyrights have to be modernized and made fit for the 21st century. The IP system's main objective is to maximize creativity and diversity, freedom of expression and prosperity.¹⁶

Let us connect IP to AI. As I argued before, human authorship and inventorship remains the normative organ point of IP law and (for now) smart robots, or autonomous agents, do not have— and ought not have—legal personhood.¹⁷ Perhaps legal agenthood may be considered in the future, to deal with liability problems towards intelligent machines. All the rationales and justifications of intellectual property are weak when applied to AI. Moreover, I maintain that AI can do without IP incentives.¹⁸ An exception to this rule could be a medical AI-system that created a flu vaccine on its own. In this case, patents and trade secrets could be necessary, as part of the incentive rewards mechanism, to make the investments in the expensive clinical trials feasible.¹⁹ An alternative would be for the government to subsidize these clinical trials — as we have seen above subsidies, prizes, competitions (for example the DARPA competition) are important IP alternatives.²⁰ These are, in

⁹ Mauritz Kop et al., *Quantum Technology, Waiving or Pledging IP?* (2021) (Forthcoming).

¹⁰ Desai, *We Don't Need No State! Wait. The State Funds That? Never Mind* (2015).

¹¹ Kop, *Yale Journal of Law & Technology* (2021).

¹² Denton, *Sanctions & Export Controls Update* (2019).

¹³ Kop, *28 Tex. Intell. Prop. L. J.* 297 (2020).

¹⁴ *Ibid.*

¹⁵ Gervais, *(Re)structuring Copyright: A Comprehensive Path to International Copyright Reform* (Edward Elgar Publishing 2017).

¹⁶ (n 13).

¹⁷ *Ibid.*

¹⁸ Mezei, *UFITA* 390-429 (2020).

¹⁹ Ouellette, *Intellectual Property as Global Public Finance* (2015).

²⁰ Hemel/Ouellette (n 3).

other words, alternative innovation policy options on the menu of the lawmakers in Brussels, Washington and Beijing.²¹

Empirical research has made clear that incentive and reward mechanisms — and with that the need for broadly scoped IP rights — vary per industry and per economic vertical, such as Healthcare, Entertainment and Defense.²² Extending copyrights slows down innovation,²³ cultural diversity, and even fundamental freedoms; adding extra layers to the existing rainbow of IP rights is not a good solution to balance the societal impact of technological progress at an exponential pace, in our current Fourth Industrial Revolution. Extending copyrights or other sui generis rights to AI and to quantum-AI hybrids, is not useful and even counterproductive since there are already enough IP instruments available, such as continuously renewable trademarks and perpetual trade secret protection.²⁴ We would like to make accelerated follow-on innovation possible, instead of waiting 20 to 70 years before we can stand on the shoulders of our brilliant predecessors.²⁵ As for AI, society will benefit from flexibility and open innovation.

2. AI training-datasets

A word about AI training-datasets then. Since data sharing is a prerequisite for a successful AI ecosystem, and hand-labelled training data-sets are a sine qua non for supervised machine learning, we require copyright exceptions that remove clearance of the input data obligations.²⁶ We need freedom to use the data, to prevent all kinds of IP infringements, such as copyright reproduction rights and database extraction rights.²⁷ This demands for a broadly scoped TDM exception, or even an articulated right to process data for machine learning purposes.²⁸ A data processing right connects the dots between IP on data, economic or *de facto* data ownership, data protection, privacy and fair competition.²⁹ For this and other reasons it is good to see that the European Commission's DG Connect is planning a revision or clarification of several Directives and Regulations in its IP Action Plan, including the Database Directive, the Copyright Directive, the Trade Secret Directive and the GDPR, as I and other innovation law scholars have recommended for some time now.³⁰ A crucial reform that has the power to change the story, with the data-driven economy in mind.³¹

²¹ (n 3).

²² Fisher, 82 University of Chicago Law Review Online 253-256 (2015); Burk/Lemley, 38 University of Chicago Press (2009); Kop, Quantum Computing and Intellectual Property Law (April 8, 2021) 35 Berkeley Technology Law Journal (2021) (forthcoming).

²³ Boyle, The Public Domain: Enclosing the Commons of the Mind (Orange Grove Books 2008).

²⁴ (n 22).

²⁵ Kop, Regulating Transformative Technology in The Quantum Age: Intellectual Property, Standardization & Sustainable Innovation, <https://law.stanford.edu/publications/regulating-transformative-technology-in-the-quantum-age-intellectual-property-standardization-sustainable-innovation/>

²⁶ Kop, TTLF Working Papers No. 65 (2020).

²⁷ Lemley/Casey, Fair Learning (2020).

²⁸ Kop, 34 Harvard Law School, Harvard Journal of Law & Technology 1-23 (2021).

²⁹ Ibid.

³⁰ (n 26); Ducato/Strowel, Limitations to Text and Data Mining and Consumer Empowerment: Making the Case for a Right to Machine Legibility (2018); Geiger/Frosio/Bulayenko, Centre for International Intellectual Property Studies (2018). See also Flynn/Geiger/Quintais et al., 7 European Intellectual Property Review 393 (2020); Gervais, 10 Journal of Intellectual property, Information Technology and Electronic Commerce Law 1 (2019).

³¹ See, European Commission, 'Commission adopts Action Plan on Intellectual Property to strengthen 'EU's economic resilience and recovery' and European Commission, 'Action Plan on Intellectual Property'.

3. Promoting a vital public domain

When searching for an innovation optimum, it's central to think in terms of exceptions, freedoms and rights, IP alternatives, and foremost a vital public domain.³² A public domain that provides breathing room, trust and legal certainty for startups and SME's that aim to become unicorns.³³

In view of this, we should apply parts of the Roman multi-layered property paradigm to AI.³⁴ Building upon this framework, I recently proposed a new public domain model for AI Creations and Inventions that crossed the autonomy threshold. This means there can be no humans upstream or downstream in the chain of discovery, invention and innovation, the input training testing and validation machine learning data, the AI system itself, neither the output data.³⁵ No humans in the chain, just machines, only then we have a public domain scenario.³⁶ This model is called *Res Publicae ex Machina*, and includes a formal PD stamp, issued by a certified body.³⁷ The Public Property from the Machine paradigm is capable of assisting us in reaching an innovation optimum that would result in a Pareto improvement.³⁸

It is essential that the EU democratizes vital means of production within the context of AI and machine learning, and encourages access, use and sharing of open and democratized data.³⁹ According to canonical thinkers Locke, Kant, Marx and Hegel the state is able to implement new forms, or modalities of property into our existing legal framework, in case it benefits society and overall prosperity.⁴⁰

4. Innovation policy, democracy & competition

Allow me to paint a bigger picture of modern sustainable innovation policy, in which IP plays an important role. When defining the law of AI, we must have a clear image in our minds of the society we would like to live in. As society gives birth to technology, technology sculpts society.⁴¹ In light of recent global developments, we should ask ourselves this question: Do we want more democracy, more free market capitalism, or more surveillance state?⁴² I would argue that AI & data driven products and services made within the EU or somewhere else in the world, such as China, India or the US, should obey EU benchmarks, including safety and conformity assessments, and abide by the high technical, legal and ethical standards that mirror Trustworthy AI core values, before these products can obtain a CE-marking and are allowed entry to the European markets.⁴³

³² (n 13); See also Hugenholtz/Senftleben, *Fair Use in Europe: In Search of Flexibilities* (2011).

³³ Mauritz Kop, *Machine Learning and EU Data-Sharing Practices: Legal Aspects of Machine Learning Training Datasets for AI Systems*, in Roland Vogl, Ed., *Research Handbook on Big Data Law*, pp. 431-452, Northampton, MA: Edward Elgar Publishing, 2021.

³⁴ (n 13).

³⁵ Ibid.

³⁶ Ginsburg/Budiardjo, 34 *Berkeley Technology Law Journal* (2019); Gervais, 105 *Iowa Law Review* 2053 (2019).

³⁷ (n 13).

³⁸ Ibid.

³⁹ (n 26); (n 28); (n 33).

⁴⁰ (n 28).

⁴¹ (n 33).

⁴² (n 1).

⁴³ See also (n 26).

On April 21 2021, the EC presented its long anticipated draft AI Regulation.⁴⁴ By Shaping the Law of AI, the EU provides a North Star to the world, determines direction and leads towards purposeful destination.⁴⁵ Regulating emerging technology is an ongoing effort, as society is in constant flux.⁴⁶ Although enforcing the proposed rules will be an entirely new adventure, I am confident the EU's legal-ethical framework — and the way of thinking about regulating 4IR tech — will change the story of making Europe fit for the Digital Age.

Lastly, unwanted market power of tech behemoths from Asia and the US should be addressed in a proportional and subsidiary manner, without stifling sustainable innovation.⁴⁷ Undesirable side-effects that create market barriers for tech-startups should be avoided. Market concentration and *de facto* monopolies can be addressed by combining several innovation policy tools that foster competition. In this case by modernizing —and setting worldwide standards for — patent law, tax law, consumer protection law, privacy regulations and anti-trust laws, that also focus on mergers and acquisitions.⁴⁸ More competition is generally a good thing for innovation, and with that for a vital economy.⁴⁹

5. 4IR tech: a horizontal-vertical regulatory approach

All of which leads to a final point. Because both innovation incentive & financial reward mechanisms, as well as safety/security risks vary per industry and per technology, policy makers should distinguish more unequivocally between economic sectors when they blueprint their digital governance solutions.⁵⁰ This is not easy: constructing these informed policy responses, which include flexible legislative frameworks, will be a challenge for our lawmakers. In practice, this means that an open innovation attitude towards AI in its various development phases might be advisable, but that more *ab initio* control is recommended when regulating quantum technology, because of the potential anthropogenic risks that the latter poses to mankind.

Besides implementing horizontal core rules for 4IR technologies, I suggest a differentiated risk-based approach, based on the pyramid of criticality with low risks at the bottom and existential risks for humanity at the top.⁵¹ This approach contains vertical, industry specific boundary setting requirements and sector-specific 4IR tech regimes accompanied by modern, layered enforcement mechanisms, that fit into existing quality management systems.⁵² Flanked — for low risk 4IR tech

⁴⁴ The European Commission is proposing the first ever legal framework on AI, which addresses the risks of AI and positions Europe to play a leading role globally. See, European Commission, Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL LAYING DOWN HARMONISED RULES ON ARTIFICIAL INTELLIGENCE (ARTIFICIAL INTELLIGENCE ACT) AND AMENDING CERTAIN UNION LEGISLATIVE ACTS, 21 April 2021; Kop, European AI Alliance (European Commission) (2020).

⁴⁵ See, European Commission, 'New rules for Artificial Intelligence – Questions and Answers' (21 April 2021).

⁴⁶ (n 1).

⁴⁷ (n 3).

⁴⁸ McCabe/Tankersley, Biden Urges More Scrutiny of Big Businesses, Such as Tech Giants (2021).

⁴⁹ See also Lemley, IP and Other Regulations (2015).

⁵⁰ (n 26).

⁵¹ (n 3); (n 11); (n 26). The EC adopted a similar AI regulatory strategy vis a vis risks, see, European Commission, Regulatory framework proposal on Artificial Intelligence, <https://digital.strategy.ec.europa.eu/en/policies/regulatory-framework-ai>.

⁵² Ibid.

applications — by self-regulation in the form of technology impact assessment audited by internal or external multidisciplinary teams, labels and certification.

We can apply this horizontal-vertical framework to other Fourth Industrial Revolution technologies such as biosciences like CRISPR-CAS and augmented reality as well.⁵³ To preserve our democratic rights and constitutional freedoms, it is crucial to embed our interoperability standards, safety norms, Humanist, French Revolution values, the Trustworthy AI doctrine and our legal-ethical quantum computing governance principles⁵⁴ into the design and infrastructure of our technology.⁵⁵

In their ongoing quest for compliance to the new European rules and regulations, companies should utilize risk-based technology impact assessments in the form of best practices, codes of conduct and moral guides.⁵⁶ These concrete tools can be used to (1) monitor and validate that real world AI and quantum driven implementations remain legal, ethical, social and technically robust during their life cycle, and to (2) make sure that sustainable, values-based 4IR technology helps us to make our planet a better world.

⁵³ (n 25).

⁵⁴ (n 11). See also *Quantum Computing Ethics*, World Economic Forum (2021), <https://www.weforum.org/projects/quantum-computing-ethics/>

⁵⁵ (n 26).

⁵⁶ Kop, European AI Alliance (European Commission) (2019).