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Between Openness and Exclusion

Property and Profitability in the
Information Economy

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Working Paper No. 2

April 2023

Impressum

Zitierung: Marlen van den Ecker, Tilman Reitz, Sebastian Seignani (2023): Between Openness and Exclusion. Property and Profitability in the Information Economy, Working Paper Nr. 2, Sonderforschungsbereich/Transregio 294 »Strukturwandel des Eigentums«.

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Redaktion: Carsten Herrmann-Pillath, Moana J. Packo, Florian Peters, Christine Schickert, Amelie Stuart

Lektorat: Lilith Poßner

Reihengestaltung: Uwe Adler, Weimar

ISSN: 2752-2741

Herausgeber: Sonderforschungsbereich/Transregio 294 »Strukturwandel des Eigentums« Friedrich-Schiller-Universität Jena, JenTower, 23. OG, Leutragraben 1, 07743 Jena

www.sfb294-eigentum.de

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Abstract

This working paper examines the relationship between property and profitability in the information economy. The inherent openness of information goods poses a problem for the enforcement of private interests which are typically protected by various intellectual property laws and exclusive, proprietary access to these goods. Contrary to this strategy of exclusion, capitalist market leaders in the digital economy pursue salient strategies of selective openness and in turn profit from network and lock-in effects. Actual business strategies often also combine elements of openness and exclusion, which make use of an interplay of complex legal arrangements in and beyond intellectual property. To reconstruct the connections between the legal and economic embedding of information goods, we review innovations in the field of intellectual property rights and ask how they relate to divergent interests of capital and other market participants. The aim of the paper is to provide an overview of hybrid and contradictory strategies and structures of techno-economic ecosystems and to lay the groundwork for further research.

Key words: property; profitability; information economy; digital economy; intellectual property; access; platform capitalism; rent

Introduction

Ever since knowledge and information processing became an important sector of capitalist economies,¹ there has been debate over how business can be profitable in this sector. Much of the problem arises from the institution of (private) property. Property is usually necessary in order to sell goods as commodities. Furthermore, it allows companies with ownership of the means of production to employ a dependent labour force. Finally, throughout the entire capitalist era, the recognition of property has been fundamental for justifying a highly unequal distribution of control over people and things. As information and data, reproducible software and cultural artefacts, as well as scientific insights gain economic importance, property-based arrangements seem threatened (to varying degrees) because it is difficult to exclude non-owners from using these goods. At times it is even difficult to establish clear and socially acceptable boundaries between ownership and non-ownership. In this paper, we ask how property and profitability are being reconfigured in theory, economic practice and within legislation in the face of these problems. Our main question is how businesses manage to maintain or newly establish their capacity to draw profits from information goods.

Answers to this question typically oscillate between two extremes. For a long time, the dominant assumption was that the inherent openness of information goods is countered by artificial, mostly legal enclosures of cognitive (or informational) commons. Access to what could be free for everyone is restricted by those who aim to make profits or draw rents or tributes from goods that they claim as their property.² Against this account – and the all-too-easy praise of a coming age of openness – more recent analyses have pointed out that the most dominant actors within digital capitalism in particular work with and profit from (predominantly) open and free access to knowledge, information and data.³ In light of these latter accounts, it is easy to assume that movements towards openness are elements of a new kind of capitalism. In our analysis, we intend to demonstrate that neither of these one-sided accounts offers an adequate understanding of the contemporary information economy. On the one hand, business strategies typically combine elements of *openness* (towards potential customers as well as towards pools of productive resources) and *exclusive access* (especially when it comes to selling goods or

¹ Cf. Fritz Machlup, *The Production and Distribution of Knowledge in the United States* (Princeton: Princeton University Press, 1962).

² Cf. for example Peter Drahos, John Braithwaite, *Information Feudalism. Who Owns the Knowledge Economy?* (New York: The New Press, 2002); James Boyle, *The Public Domain. Enclosing the Commons of the Mind* (New Haven, CT: Yale University Press, 2008); Ugo Pagano, "The Crisis of Intellectual Monopoly Capitalism," in *Cambridge Journal of Economics* 38, 2014, 1409–1429.

³ Cf. as two good examples Tom Slee, *What's Yours is Mine. Against the Sharing Economy* (New York, London: Or Books, 2015), 109–138; Arwid Lund, Mariano Zukerfeld, *Corporate Capitalism's Use of Openness: Profit for Free?* (Cham: Palgrave Macmillan, 2020).

services). On the other hand, legal arrangements in the sphere of intellectual property do not always change in correspondence with the interests of capital. The aim of our paper is to produce a preliminary overview of the hybrid and contradictory strategies and constellations that have developed and lay the groundwork for a more detailed empirical analysis.

We proceed in four steps. In an introductory first section, we explain in more detail why information goods pose a problem for the classical functions of private property, relating these aspects to the neoclassical, Marxist and Schumpeterian traditions of economic thought. In a second section, we review important changes in intellectual property law and ask how they relate to the divergent interests that prevail in the field. We discuss both the trend towards tightened property rights and countervailing developments such as open licences, legal devices beyond mere property law and new economic interests in openness. In a third section, we look at some salient and more pronounced strategies of selective openness with which capitalist firms react to the problems and legal regulations at hand and enquire into the consequences for property related categories such as markets, monopolies and rent. Engaging with ongoing debates, we analyse (control over) information ecosystems as pivotal to new emerging strategies and discuss how economic actors extract rents from such contexts. In our conclusion, we try to make sense of the tensions between new restrictions and selective openness and propose an agenda for further research.

1. Fundamental problems: Information goods and theories of capitalist value creation

The functions of private property, which have become problematic in the information age, are almost paradigmatically captured by well-known economic theories. Whereas the conceptual means of the neoclassical tradition show how these goods cannot easily be *sold as commodities*, the Marxist tradition helps to highlight increasingly blurring boundaries of the *ownership of means of production*, while Schumpeterian ideas of innovation-based profits illustrate chances and limits of *justifying concentrated advantages* in networks of cognitive production. In the following paragraphs, we discuss how these theoretical approaches help to conceptualise the new situation but are also challenged by it.

For mainstream neoclassical economics, where scarce goods are the model case, information goods as such are problematic. Typically, they are *non-rival* goods because their use by one person does not prevent their use by others. Moreover, since it is often difficult or costly to restrict access to them, they are considered *non-exclusive* goods.

Theoretically they could be made available to everyone for free, but this would erode the economic incentive to produce further knowledge, which for neoclassical authors is the opportunity to sell the products of one's labour as commodities. The neoclassical approach fails to offer a genuine economic solution to this *trade-off*, merely recommending political "balancing"⁴. Moreover, this approach must consider two further factors. First, production and productivity are not enhanced by economic incentives alone. Second, the advancement of knowledge also profits from free access to the informational means of production.⁵ Critical versions of the neoclassical account – particularly in jurisprudence (see section 2) – have argued that scarcity is not only artificially created, it also benefits merely a minority of powerful economic actors who lay claim to intellectual property. In this case, mainstream economic reasoning challenges the legitimacy of a property-based economy.

Critical Marxist approaches to analysing the information economy encounter similarly severe theoretical problems. While Marx argued that the labour required for the production of goods regulates exchange relations under capitalism, this measure no longer applies when the "general intellect", i.e. the collective knowledge and cognitive capacities of a society, becomes the most important productive force.⁶ If "labour in its immediate form" is therefore no longer "the great source of wealth", "labour time" can also no longer be its "measure":

As soon as labour in its immediate form has ceased to be the great source of wealth, labour time ceases and must cease to be its measure, and therefore exchange value [must cease to be the measure] of use value. The surplus labour of the masses has ceased to be the condition for the development of general wealth, just as the non-labour of a few has ceased to be the condition for the development of the general powers of the human mind. As a result, production based upon exchange value collapses [...].⁷

Heterodox Marxist theories, most notably the Post-Workerism of Negri, Hardt, Vercellone and others, do not envisage the breakdown of capitalism as a result of this tendency. They suggest instead that "cognitive capitalism" (Yann Moulier-Boutang) appropriates the wealth of immaterial labour in a different way. Rather than directly organising this labour, or even controlling the most important productive forces (the knowledge of the workers themselves and their living communication), capital appropriates the cultural commons

⁴ Cf. Joseph Stiglitz, "Knowledge as a global public good," in *Global public goods: International cooperation in the 21st century*, eds. Inge Kaul et al. (Oxford: Oxford University Press, 1999), 308–325, here 311.

⁵ Cf. *ibid.*, 312.

⁶ Karl Marx, "Outlines of the Critique of Political Economy (Rough Draft of 1857-58)," in *Marx Engels Collected Works (MECW)* (London: Lawrence & Wishart, 2010), 29:92.

⁷ *Ibid.*, 91. (For the original German phrasing, cf. Karl Marx, "Grundrisse zur Kritik der politischen Ökonomie (1857-58)", in *Marx Engels Werke (MEW)*, Vol. 42 (Berlin: Dietz Verlag, 1983), 594.)

only after the fact.⁸ However, how exactly companies achieve profits or extract rents under such conditions, is not really explained by the proponents of this hypothesis. Moreover, the labour-employing public and private sector apparatuses of technology, research, development, and knowledge transfer are regarded only as a kind of confounding factor.

A closer analysis of these apparatuses – and the mode of production increasingly shaped by them – can be found in theories of innovation that draw predominantly on Joseph Schumpeter. Schumpeter's theory is also pertinent to the specific justification of capitalist profits, which neoclassical accounts fail to give in non-scarcity situations (while Marxist accounts, of course, never aimed at justifying profit). One basic functional assumption is common to all three traditions: When a company first implements “new combinations”⁹ of production factors that allow it to produce more efficiently or even to offer entirely new products, it will at first have large competitive advantages and high profit margins. Schumpeter considered this to be the only real source of profit. His theory would seem to make sense in an age of permanent technological rupture. However, approaches that adapt Schumpeter's narrow focus on the dynamic and creatively destructive entrepreneur along with the financial capital made available to risky enterprises¹⁰ tend to overlook publicly funded research which enables the enormous profits of large pharmaceutical or digital corporations.¹¹ Furthermore, a theory of the information economy must explain which innovators are able to perpetuate their advantages for longer time spans.¹²

On a more general note, the focus on the *new* shared by all three debates threatens to obscure the concentrated economic power that is constantly expanding through the accumulation of profit, which continues to characterise capitalism even in its current digital phase. Today, this power is organised in complex ways. It is well known that in larger companies a conglomerate of executives, shareholders and legal or financial experts control the organisations and divide profits among themselves. A broad layer of highly qualified employees and middle management can equally achieve comparatively high wages, while ordinary workers (who still carry out the bulk of the work and do so in ever-growing numbers) are distributed across global supply chains that range from raw

⁸ Cf. Michael Hardt, Antonio Negri, *Commonwealth* (Cambridge: Belknap Press of Harvard University Press, 2009), 131–149.

⁹ Joseph A. Schumpeter, *The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle* (New Jersey: Transaction Publishers, 1983), 132. (For the original German version, cf. Joseph A. Schumpeter, *Theorie der wirtschaftlichen Entwicklung* (Leipzig: Duncker & Humblot, 1912), 158.)

¹⁰ Cf. *ibid.*, 137.

¹¹ Cf. Mariana Mazzucato, *The Entrepreneurial State: Debunking Public Vs. Private Sector Myths* (London: Anthem Press, 2015).

¹² Cf. Cecilia Rikap, *Capitalism, Power and Innovation: Intellectual Monopoly Capitalism Uncovered* (New York: Routledge, 2021), 9.

material extraction over outsourced manufacturing industries to service jobs. Marxist authors have highlighted that these structures must be analysed down to the lowest levels in order not to fall prey to myths of a supposedly “weightless economy.”¹³ Products such as smartphones exhibit a worldwide network of exploitation.¹⁴ The use of data, software and artificial intelligence (AI) mainly serves to make the production of such devices, which are conventional property goods, more efficient, facilitate their sale and to make them more attractive to buyers. Even when free operating systems and apps attract customers, companies are ultimately tied to the traditional logic of selling devices.

Analysis also needs to go beyond the well-known examples while retaining the important insights gained. Digital capitalism is undeniably shaped by companies like Google, Apple, Facebook and Amazon (GAFA), as well as Microsoft and perhaps Tesla too, along with the respective Chinese equivalents. Within less than two decades, these companies have become globally dominant with new business models, incredible profits and stock market listings. In spite of recent problems, they continue to play a unique role in their core sectors. Moreover, they have developed or incorporated profit strategies that are arguably also paradigmatic for the other big actors of digital capitalism, which range from culture platforms like Spotify and Netflix to consumer services such as those of PayPal or Booking.com. Nevertheless, a large number of smaller and less visible information technology development and service companies are also active in the oligopolistic markets dominated by the big few and networks such as the open-source community have created their own ownership and cooperation structures, while public research institutions and research-intensive start-ups are also making contributions. A comparative theoretical perspective can be strengthened by looking at the information intensive firms of other sectors, namely the biotechnological and pharmaceutical industries. These are also directly interwoven with digital innovations and enterprises.¹⁵

On the basis of these preliminary remarks, the role of property in digital capitalism can be narrowed down. The sale of commodities, the exploitation of labour and the justification of inequality are only partially threatened by the new information goods. However, they are less directly linked to standard private property than before. Instead, new forms of property (such as shared databases or cultural commons) and arrangements beyond property (such as hierarchies of control or technological capacities) are gaining importance.

¹³ Cf., with reference to titles of Danny Quah and Diane Coyle, Ursula Huws, “Material world: The myth of the weightless economy,” in *The Making of the Cybertariat: Virtual Work in a Real World*, ed. Ursula Huws (New York: Monthly Review Press, 2003), 126–151.

¹⁴ Cf. Nick Dyer-Witheford, *Cyber-Proletariat: Global Labour in the Digital Vortex* (London: Pluto Press, 2015), 102–124.

¹⁵ Valuable insights on this comparative perspective can be found in the texts of Cecilia Rikap, which are quoted frequently in this paper.

- *Conditions for selling* are increasingly shaped by the access providers have to digitised infrastructures of advertising, customer relationships and distribution. While such structures were already of relevance in pre-digital capitalism, the innovative efforts of the GAFAs companies and many smaller digital firms have arguably concentrated on these contexts of circulation and often come to dominate the producing sectors.¹⁶
- Control over the *means of production*, which according to Marxist assumptions enables the exploitation of waged labour and the generation of profits, is no longer structured by property alone, but by the more or less privileged position of economic actors in information environments that are only partially proprietary.
- This eventually causes accepted *inequalities* to shift: Even if economic power is still regulated by money, the acceptance of high incomes and profits (or even the monetary valuation of corporate assets) seems to depend increasingly on the intellectual competences, innovative power and social significance ascribed to those benefiting from them. The latest major example is big pharma's supply of Covid vaccines.

Numerous questions for economic and social analysis can be derived from this initial overview. We will focus on two core problems: To what extent does the digital information economy still presuppose exclusive private property for the generation of profits? In what ways do economic and legislative decision makers of the digital information economy try to adapt property arrangements to the challenges of information-centred production?

We expect a mixed answer. While in part private property remains vital for profit-making and accumulation, it is also associated with other, potentially more flexible mechanisms of restriction and exclusion and struggles for privileged positions in semi-open ecologies (including platforms). In the case of mainly exclusive arrangements, we identify *functional equivalents to property*, such as highly concentrated productive capacities or customer relations. Insofar as law plays a role in this, for example in terms of personal rights, we speak more specifically of *legal functional equivalents*. To signify the various forms of excluding others from the use, control and advantages of information goods, we sporadically use the somewhat artificial term of *closure*. Originally employed to describe social exclusion in the interest of specific groups,¹⁷ this term also points to technological and other functional restrictions of access that serve the same goal.

¹⁶ This is also a central point of Philipp Staab, *Falsche Versprechen. Wachstum im Digitalen Kapitalismus* (Hamburg: Hamburger Edition, 2016) and of Sabine Pfeiffer, *Digital capitalism and distributive forces* (Bielefeld: transcript, 2022).

¹⁷ Max Weber had used the notion of *closure* (Schließung) to discuss a monopolisation or concentration of lucrative options for action that perpetuates socio-economic inequality, and a number of authors have worked with his concept. For the most comprehensive account, see Charles Tilly, *Durable Inequality* (Berkeley: University of California Press, 1998), 117–169.

In order to assess the role of ordinary and alternative forms of exclusive or effective control in the information economy, in the next section we first look at legal innovations in intellectual property law before turning in more detail to prominent business models of digital capitalism.

2. Legal innovations: The tightening and loosening of intellectual property rights

The intellectual property and contract rights that affect transactions in today's information economy have from the outset been shaped by various and often conflicting economic interests. Yet, there are also other interests and principles at work in the relevant legal structures and restructurings: the protection of data and users' personal rights, individual and cultural interests in free exchange and communication, government interests ranging from legal stability to tax flows and struggles for hegemony and technological leadership on the international level. The predictable result is a number of conflicts. An important fault line runs between the public interest in public domain goods and the private interest in making and maintaining profits. However, companies do not always favour an increase in property rights. In the platform business or in the development of technology, weaker exclusion and protection rights and practices can prove lucrative when, for example, companies process user data, use open-source software or access public research results and administrative data. Here, another line of conflict runs between the interests of information-using companies to exploit unpaid activities and the interests of intellectual workers in receiving appropriate remuneration. Finally, the interest of users in protecting their personal data plays variable roles in conflicts over access rights, as will be shown.

Intellectual property law can be divided into roughly two domains, copyright (or authors' rights) on the one hand and industrial property rights (especially patent law, but also design, trademark, and competition law, as well as database rights) on the other. In the latter sphere contractual fallback options such as non-disclosure agreements are also frequently used to protect organisational knowledge. In recent years, particularly strong legal innovations have been seen in the area of data protection, which does not directly encompass property rights, but is of great importance for the actual use of property.

In what follows, the first subsection maps out important international and national legal innovations in the field of copyright over the last thirty years, noting a tendency for cultural exchange to become more restricted, along with a growing set of divergent interests due to the important position of platform companies and the emerging field of user-generated content. In the second subsection, a counter-trend towards more

openness in copyright issues is noted in the field of software development. The corporate extraction of publicly produced knowledge is particularly striking when this knowledge is patentable, which will be our focus in the third subsection. The last subsection is concerned with the intricacies of conflict between data exploitation and users' data privacy.

The propertisation of cultural exchange on the Internet

Along with the expansion of the so-called Web 2.0, the possibilities of worldwide cultural exchange have radically expanded: from blogs to mashups to podcasts and videos. At the same time, the ubiquity of user-generated content raises the prospect of an extension of copyright to cultural expressions that used to be free of regulation in analogue life.¹⁸ "No one would think that as you tell a joke around your dinner table, or sing songs with your friends, [...] you need a lawyer standing next to you, clearing the rights to 'use' the culture as you make your creative remix."¹⁹ However, the new regulatory imperatives actually extend copyrights beyond commercial creative uses. Furthermore, the US Copyright Term Extension Act (CTEA)²⁰ of 1998 extended the copyright term to the length of an author's lifetime plus 70 years, which further delays the transition of works into the public domain (within the European Union this has been the case since the Copyright Duration Directive²¹ was passed in 1993). At the end of the 1990s, this already constituted a compromise between the first Internet-based digital platforms and the established cultural industries – including lobby-strong film studios, the music industry, and large publishing houses – whose copyright-protected works were distributed most widely and quickly via the new digital networks.²² With the Digital Millennium Copyright Act (DMCA)²³, also passed in 1998, circumventing technical protection measures to copyrighted works became a punishable offence, while digital companies themselves were granted immunity from prosecution for certain types of unauthorised use of their platforms.²⁴ This increased regulation of access to, use, modification, and distribution of digital

¹⁸ Cf. Lawrence Lessing, *Code: Version 2.0* (New York: Basic Books, 2006), 193 f.

¹⁹ Ibid, 194.

²⁰ Public Law 105–298, 105th Congress, ("An act to amend the provisions of title 17, United States Code, with respect to the duration of copyright, and for other purposes ..."), <https://www.govinfo.gov/content/pkg/PLAW-105publ298/pdf/PLAW-105publ298.pdf>.

²¹ Council Directive 93/98/EEC of 29 October 1993, harmonising the term of protection of copyright and certain related rights, <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:31993L0098>.

²² Cf. Bill D. Herman, *The Fight over Digital Rights: The Politics of Copyright and Technology* (Cambridge: Cambridge University Press, 2013), 52.

²³ Cf. Public Law 105–304, 105th Congress, *Digital Millennium Copyright Act*, <https://www.govinfo.gov/content/pkg/PLAW-105publ304/html/PLAW-105publ304.htm>. The DMCA implements two 1996 *World Intellectual Property Organization* (WIPO) treaties.

²⁴ Cf. Herman, *The Fight over Digital Rights*, 37 f., as quoted in Jessica Silbey, *Against Progress: Intellectual Property and Fundamental Values in the Internet Age* (Stanford: Stanford University Press, 2022), 110.

content is known as Digital Rights Management (DRM) and its implementation depends on intricate and costly control technologies.²⁵

As these acts were being passed in the late 1990s, legal scholars such as Lawrence Lessig argued instead for openness and creative freedom to be legally anchored in the architecture of cyberspace, without opposing the (re-)commercialisation of free content in principle.²⁶ For this purpose, the Creative Commons (CC) organisation was founded by Lessig in 2001, issuing its first licences in 2002²⁷ and establishing a new system of licences for digital works. Following the model of the General Public License (GPL) in the software sector, CC licences enable creators to define (in an internationally standardised format) commercial and non-commercial rights of use and stipulate free content (open content) in a legally binding way.²⁸ Since CC licences combine the rights of authors with contract clauses throughout different national copyright systems, their legal structure is complex. Yet the traditional economic status of property is clearly undermined by this new legal device: instead of promising gains to producers by restricting access to reproductions, they basically serve to warrant free access.

The renowned legal scholar Mark Lemley also insists that pre-digital intellectual property rights are hardly applicable in the virtual space.²⁹ Contrary to their primary source of justification³⁰ they even tend to *hinder* creative and technological innovation in a digital world that is defined by the ease with which things can be copied and distributed. However, similar to other proponents of Law & Economics, Lemley remains fixated on the idea of setting *incentives* to foster innovation and growth, failing to recognise that the strict enforcement of copyright protection primarily benefits established companies in the cultural industries³¹ rather than individual creators.

Since the commercial breakthrough of subscription-based streaming services such as *Spotify* and *Netflix*, intermediaries (or platforms) with strong negotiating power have emerged. Together with technological platform providers such as Apple, these intermediaries pocket a large share of the revenues (see section 2). Moreover, they usually pay only very low royalties to publishers, record companies, or film studios, and

²⁵ Cf. *ibid.*, 9.

²⁶ Cf. Lawrence Lessig, *Code and Other Laws of Cyberspace* (New York: Basic Books, 1999).

²⁷ Cf. Creative Commons, "Creative Commons Announced," last modified May 16, 2002, <https://creativecommons.org/2002/05/16/creativecommonsannounced-2/>.

²⁸ Cf. Creative Commons, "License design and rationale," accessed December 7, 2022, <https://creativecommons.org/licenses/>.

²⁹ Cf. Mark Lemley, "IP in a World Without Scarcity," in *New York University Law Review* 90, no. 2 (May 2015), 460–515.

³⁰ The so-called *Progress Clause* of the US Constitution states as its goal, "To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries," cf. U.S. Const. art. I, § 8, cl. 8, "Intellectual Property," accessed December 7, 2022, <https://constitution.congress.gov/browse/article-1/section-8/clause-8/>.

³¹ Cf. Herman, *The Fight over Digital Rights*, 52.

keep payments to creators to a minimum.³² At the same time, the various copyright intermediaries exert a strong influence on national and international legislative processes, while the actual creators tend to be disregarded.³³ The buzzword “value gap” expresses this discrepancy and is used in copyright debates³⁴ to negotiate higher fees for licensors.

In recent years, liability rules in particular have been tightened in Germany and the EU. The EU Copyright Directive 2019/790 of 17 April 2019 brought new regulations. Its regulations concerning uploaded content – resulting in so-called *upload filters* – were criticised as encroaching on freedom of expression and information, as well as artistic freedom, because they inspect or even block uploaded content *ex ante*.³⁵ The artistic use of copyrighted works “for purposes of quotation, criticism, review, caricature, parody or pastiche”³⁶ and their use in social media was permitted in similar ways to the *fair use doctrine* in US copyright, but with the introduction of the Directive this use was significantly restricted. With the Copyright Service Providers Act (*Urheberrechts-Diensteanbieter-Gesetz, UrhDaG*), German copyright law was amended on 20 May 2021 in accordance with the EU Directive. The official aim was to create a “fair balance of interests that equally benefits creators, rights users and users.”³⁷ However, creators and users are actually left out in the cold. The remix culture that is inherent to the Internet, namely the continuous development and rearrangement of already existing works, is in effect made all the more difficult by the new upload filters.

Lately, milieus close to the art world have even been seeking to expand forms of cultural ownership beyond the scope of legislation. Since 2017, specialised online marketplaces have been auctioning new types of crypto tokens – *Non-Fungible Tokens* (NFTs) – based on blockchain technologies that are *singular* because they are unforgeable and indivisible, much like an invoice for an original artwork. NFT transactions, like all transactions on blockchains, are controlled through the decentralised storage of all

³² Cf. Jessica Litman, “What We Don’t See When We See Copyright as Property,” in *The Cambridge Law Journal* 77, no. 3 (November 2018): 536–58, here 542.

³³ Cf. *ibid.*, 557.

³⁴ Cf. debates in the European parliament (e.g. “Debates: 8.4. Copyright in the Digital Single Market (A8-0245/2018 - Axel Voss),” European parliament, last modified March 26, 2019, https://www.europarl.europa.eu/doceo/document/CRE-8-2019-03-26-ITM-008-04_EN.html); also check formulations in relation to the keyword “value” such as in the “Proposal for a Directive Of The European Parliament And Of The Council on copyright in the Digital Single Market”, Brussels, 14.9.2016, COM(2016) 593 final, 2016/0280(COD), e.g.: “It is therefore necessary to guarantee that authors and rightholders receive a fair share of the value that is generated by the use of their works and other subject-matter.”

³⁵ Cf. Felix Reda, “CJEU says upload filters must respect user rights – but what if they don’t?,” *Digital Freedom Fund*, last modified May 11, 2022, <https://digitalfreedomfund.org/cjeu-says-upload-filters-must-respect-user-rights-but-what-if-they-dont/>.

³⁶ Cf. Directive (EU) 2019/790 of the European Parliament and of the Council of 17 April 2019 on copyright and related rights in the Digital Single Market and amending Directives 96/9/EC and 2001/29/EC, Bruxelles, 17 April 2019, L 130/108, Recital 70, accessed December 7, 2022, <https://eur-lex.europa.eu/eli/dir/2019/790/oj>.

³⁷ Deutscher Bundestag, “Urheberrecht soll für digitalen Binnenmarkt fit gemacht werden”, accessed December 7, 2022, <https://www.bundestag.de/dokumente/textarchiv/2021/kw12-de-digitales-urheberrecht-826552>, own translation.

previous transaction data on the blockchain and are deemed eligible to represent digital or even analogue (art) objects and are marketed as such thanks to this technical feature.³⁸ Thus, NFTs offer new possibilities of commercialisation within the digital space. They claim to codify social prestige due to their technically produced singularity, they function as speculative goods – much like conventional collector’s items – and they are intended in particular to provide digital artists with new and much needed sources of income. When purchasing an NFT, copyrights cannot (yet) be simply transferred to the buyer, but it is quite common that at least usage rights, such as the right to reproduction, are granted when the licence is issued along with the transaction. Similar to Creative Commons and copyleft licences (see below), NFTs are currently based on a combination of exclusive rights of use *and* contract law. But unlike the other cases, the commercial practice around NFTs is pushing for legal change towards a tightening of property-like rights in the so-called *Web3* or *Metaverse*, where all content would be proprietary, i.e. assigned to an owner in their authorised crypto wallet, with the digital space becoming commodified down to its smallest parcels.³⁹

The opening up of information technology development on an open-source basis

In professional software production there is a contrary trend that has remained important, namely the free exchange between programmers. The collaborative development and peer production of free and open-source software and the culture of collaborative knowledge creation upheld here undermines the romantic idea of a single original creator or inventor whose intellectual work is to be remunerated in the form of copyrights.⁴⁰

Since the 1980s, new legally valid copyleft licensing models have been developed as part of the *free software movement*, formally founded by the programmer and activist Richard Stallman. These open-source models, for example the well-known GNU *General Public License* (GPL), are meant to ensure that even after software is further developed, the code always remains free and open.⁴¹ The innovative clause that guarantees the inclusive use of free and open-source software consists (despite the intended openness) of an

³⁸ Cf. Andres Guadamuz, “The treachery of images: non-fungible tokens and copyright,” in *Journal of Intellectual Property Law & Practice* 16, no. 12 (December 2021): 1367–1385, here 1367.

³⁹ Cf. Georg Fischer, “Die kleinste lizenzierbare Einheit: Schrumpfen oder Multiplikation von Eigentumsansprüchen?”, SFB Blog Transformation of Property, last modified August 30, 2022, <https://sfb294-eigentum.de/de/blog/die-kleinste-lizenzierbare-einheit-schrumpfen-oder-multiplikati/>.

⁴⁰ Cf. James Boyle, *Shamans, Software, and Spleens: Law and the Construction of the Information Society* (Cambridge: Harvard University Press, 1996), 114.

⁴¹ “The GNU Manifesto,” Free Software Foundation, last modified January 1, 2022, <https://www.gnu.org/gnu/manifesto.html>.

exclusive right for the original developer *and* a contractual agreement with those reusing their work.⁴²

While there was much hope in the early days of the free software movement that there would be “more decentralized and democratic organizational and coordination structures [...]”⁴³ and that it might “empower once-passive citizens, users, and consumers”⁴⁴, since the mid-2000s open-source code has increasingly been used for commercial innovation strategies.⁴⁵ Most large software companies nowadays use open-source code, often in combination with proprietary software elements, to develop products that are in turn distributed commercially – empowered by *soft* copyleft licences.⁴⁶ Voluntary participation in open-source projects, which is supposedly motivated by intrinsic values or “psychological needs, pleasure, and a sense of social belonging,”⁴⁷ decreases as the size of the communities and the projects grows. This is because developers sent by companies contribute significantly to the projects and hierarchical decision-making patterns usually emerge.⁴⁸ Even strong counter examples, such as the programmatically open and democratically self-governing Debian community, which is one of the largest Linux providers, raise the question of who can afford to do so much unpaid work in their daily lives⁴⁹ and to what extent large corporations simply appropriate the results. Similar questions can be raised in the field of publicly funded intellectual work.

Public research as a patentable property and a free resource

The development of the idea that the collective creation of knowledge may be exploited commercially is observable beyond code and digitally encoded content. It is supported particularly by reforms to patent law or in the general field of industrial property rights, which patents are part of. Since the Bayh–Dole Act of 1980 in the US, allowing the private patenting of results of publicly funded research, new economic incentives have been

⁴² Cf. Anna Rogler, *Inklusive Immaterialgüterrechte* (Berlin: Duncker & Humblot, 2020), 45.

⁴³ Jan-Felix Schrape, “Open Source Communities: The Sociotechnical Institutionalization of Collective Invention,” in *Collectivity and Power on the Internet: A Sociological Perspective*, eds. Ulrich Dolata, Jan-Felix Schrape (Cham: Springer, 2018), 57–83, here 57.

⁴⁴ Cf. *ibid.*, 58.

⁴⁵ Cf. *ibid.*, 62 f.

⁴⁶ Cf. Sabine Nuss, *Copyright & Copyriot. Aneignungskonflikte um geistiges Eigentum im informationellen Kapitalismus* (Münster: Westfälisches Dampfboot, 2006), 241–245.

⁴⁷ Yochai Benkler, “Commons-Based Strategies and the Problems of Patents,” in *Science* 305, no. 5687 (August 2004): 1110–1111, here 1110.

⁴⁸ Cf. Schrape, “Open Source Communities,” 58; Mathieu O’Neil et al., “The Duality of Peer Production,” in *The Handbook of Peer Production*, eds. O’Neil et al. (Hoboken: Wiley Blackwell, 2020), 1–17, here 12.

⁴⁹ Cf. Mathieu O’Neil et al., “Open Source Has Won and Lost the War: Legitimising Commercial–Communal Hybridisation in a FOSS Project,” in *New Media & Society* 23, no. 5 (May 2021), 1157–1180, here 1174 f.

created.⁵⁰ This is especially the case for universities and their employees, and these new opportunities have played a major role for biotechnological innovations in particular.⁵¹ Here, too, the extent to which strong intellectual property rights are championed depends on economic positions. Kaushik Sunder Rajan describes the market for drug development (using terms coined by Kenneth Arrow) as an “upstream-downstream terrain.”⁵² In the biotechnological development phase (“upstream”) corporations seek open cooperation with research organisations and firms – for example in the form of shared databases –⁵³ but for end products such as medicines (“downstream”⁵⁴) they prefer to lock up information or claim intellectual property. The public is thus forced to pay twice for new products – first through the tax system that funds discoveries and inventions in academic science and later as monopoly prices to the inventors and innovators (or the pharmaceutical companies) that have developed marketable products and successfully registered a patent.⁵⁵ Since state research funding shields companies from investment risks, scholars like Mariana Mazzucato demand that at least non-profit investments should be given preference and that the state should share in profits reaped by the corporations.⁵⁶

The complex interplay of public and private research and development evidently also extends beyond national borders. On the international level, the process of establishing global rules for “trade related aspects of intellectual property rights” (TRIPS) has played a vital role in enabling profits or rents from information or information intensive goods since the 1990s, as have bilateral or multilateral agreements more recently. Under these regulations, Western technology leaders not only continually increased their immediate gains from intellectual property-related payments in the last three decades, but could also extend their business activities without endangering their exclusive technological advantages.⁵⁷

In many areas, profitable advantages extend years beyond legal protection. For example, the US company *Myriad Genetics*, while holding a patent on a gene sequence for the early detection of breast cancer, was able to collect huge inventories of patient data, which

⁵⁰ Cf. Elizabeth Popp Berman, *Creating the Market University: How Academic Science Became an Economic Engine* (Princeton: Princeton University Press, 2012), 94 ff.

⁵¹ Cf. Kaushik Sunder Rajan, *Biocapital: The Constitution of Postgenomic Life* (Durham: Duke University Press, 2006).

⁵² *Ibid.*, 56.

⁵³ Cf. *ibid.*, 47 f.

⁵⁴ *Ibid.*, 55.

⁵⁵ Cf. Rochelle Cooper Dreyfuss, “Double or Nothing: Technology Transfer Under the Bayh–Dole Act,” in *Business Innovation and the Law: Perspectives from Intellectual Property, Labour, Competition and Corporate Law*, eds. John Duns et al. (New York: Edward Elgar Publishing, 2013), 52–73, here 53.

⁵⁶ Cf. Mariana Mazzucato, *The Value of Everything: Making and Taking in the Global Economy* (New York: PublicAffairs, 2018), 224.

⁵⁷ Cf. Cédric Durand, William Milberg, “Intellectual Monopoly in Global Value Chains,” in *Review of International Political Economy* 27, no. 2 (2020): 404–29, here 413–16.

remained protected by contractual trade secrets even when the patent was withdrawn.⁵⁸ Through the highly accurate test results enabled by this advantage, Myriad remained the market leader in breast cancer prognostics and continued to achieve high profits (while efforts for data-sharing in the field are still only slowly advancing).⁵⁹ In this example – as well as in other, less dubious cases – “data-generating patents” create a knowledge advantage over competitors that can be translated into consistent revenue streams.⁶⁰ This shows that not only intellectual property rights, such as copyrights or patents, play an essential role in the legal containment of knowledge and information assets, but also, as in the case of Myriad, business and contract law. The combination of different rights and legally shielded advantages in this case can even be seen as creating a functional equivalent to a commercial right that does not (yet) exist: a property right in data.⁶¹

Data exploitation and informational personality rights

Personal rights (to anonymity, privacy, and transparency) can also be seen as functionally equivalent to intellectual property rights in some areas. At first sight, a different view seems appropriate. Personal information rights and data protection initially set limits to the economic exploitation of data generated through the use of Internet services. Where such data flows are nevertheless integrated into profit-making strategies, two developments are decisive: One is the narrow interpretations of rights along with forms and fictions of anonymisation with which companies circumvent legal protections. The other is the design of informed consent as a quasi-exchange act. The resulting situation deserves a closer look and more concrete analysis.

In the EU, this legal area has been regulated more strictly in recent years (in part through unified standard setting), but the new rules have not been able to effectively restrict the commercial exploitation of user data. With the General Data Protection Regulation (GDPR)⁶², regulations for the transparent collection and use of data were enacted for Internet service providers, on the basis of which users can give informed consent. These measures were flanked by stricter sanctions for violations (for example, the advertising practices of Google and Facebook in France were subject to heavy fines in 2021).⁶³ Later,

⁵⁸ Cf. Brenda M. Simon, Ted Sichelman, “Data-Generating Patents,” in *Northwestern University Law Review* 111, no. 2 (February 2017): 377–438, here 378 and 393–396; as well as Pistor, Katharina. *The Code of Capital: How the Law Creates Wealth and Inequality* (Princeton, NJ: Princeton University Press, 2019), 128.

⁵⁹ Cf. Juli M. Bollinger et al., “BRCA1/2 Variant Data-Sharing Practices,” in *The Journal of Law, Medicine and Ethics* 41, no. 1 (2019): 88–96.

⁶⁰ Cf. Simon, Sichelman, “Data-Generating Patents,” 378–380.

⁶¹ We are grateful to our reviewer Niklas Angebauer for suggesting this point to us.

⁶² Cf. “General Data Protection Regulation (GDPR),” *gdpr-info.eu*, accessed December 7, 2022, <https://gdpr-info.eu/>.

⁶³ Cf. “France fines Google and Facebook over cookies,” *BBC News*, last modified January 7, 2022, <https://www.bbc.com/news/technology-59909647>.

the Digital Services Act⁶⁴ and the complementary *Digital Markets Act*⁶⁵ (which explicitly targets large Internet intermediaries, i.e. platforms) added further transparency obligations for targeted advertising and banned certain types of advertising (such as political advertising and ads that target children and people of specific sexual orientations).⁶⁶ The system of targeted, surveillance-based advertising using cookies and trackers has been shaken by these regulatory interventions, but also by continued competition between tech companies (with results sometimes referred to as the “cookie apocalypse”⁶⁷). For example, EU data protection authorities have decided that the so-called “Transparency and Consent Framework” (TCF), which currently organises the auction of targeted advertising space on the Internet, is illegal. Facebook (Meta) in particular gained a dominant position in the ad-tech ecosystem with the help of this framework. Major competitors such as Apple and Google (Alphabet) are now promising legally compliant alternatives in which relevant data no longer circulate on the Internet but remain on the connected end devices. To prevent this shift of dominant positions within the ecosystem, Meta is now working with the non-commercial company Firefox, which provides the popular Internet browser Mozilla. Unlike the end-device based strategy, data is now to be stored within a secured and interoperable network, which means that advertisers can still use it, just no longer access it in detail. In this case, it is not the ownership of data or even direct control that is relevant for the digital capitalist firm, but merely the ability to effectively use data thanks to appropriate codes and analytical capacities. These capacities are concentrated in the large tech corporations.

In such contexts, data protection laws and informational autonomy can be seen as another functional equivalent of (non-existent) data ownership when integrated into business strategies. The point is neither that law itself codifies data as property nor that informational rights support property claims, but that data is constructed as an alienable object.⁶⁸ Privacy is often understood and enacted in a possessive-individualistic way, in the sense that we pay for the use of otherwise free Internet services with our data. In this understanding, users (practically) own certain data and thus also have the right to sell this

⁶⁴ Cf. “Regulation (EU) 2022/2065 of the European Parliament and of the Council of 19 October 2022 on a Single Market For Digital Services and amending Directive 2000/31/EC (Digital Services Act),” *Official Journal of the European Union*, last modified October 27, 2022, <https://eur-lex.europa.eu/eli/reg/2022/2065/oj>.

⁶⁵ Cf. “Regulation (EU) 2022/1925 of the European Parliament and of the Council of 14 September 2022 on contestable and fair markets in the digital sector and amending Directives (EU) 2019/1937 and (EU) 2020/1828 (Digital Markets Act),” *Official Journal of the European Union*, last modified October 12, 2022, <https://eur-lex.europa.eu/eli/reg/2022/1925/oj>.

⁶⁶ Cf. “EU Digital Markets Act and Digital Services Act explained,” European Parliament, last modified July 5, 2022, <https://www.europarl.europa.eu/news/en/headlines/society/20211209STO19124/eu-digital-markets-act-and-digital-services-act-explained>.

⁶⁷ Cf. Alex Barker, “‘Cookie Apocalypse’ Forces Profound Changes in Online Advertising,” *Financial Times*, last modified February 26, 2020, <https://www.ft.com/content/169079b2-3ba1-11ea-b84f-a62c46f39bc2>.

⁶⁸ See the discussion in Sebastian Seignani, *Privacy and Capitalism in the Age of Social Media* (New York: Routledge, 2016), 168–189.

property in exchange for other services. On the level of individual rights, the results are less than encouraging. Possessive-individualistic conceptions of rights lead to data protection strategies that rely on privacy self-management and on informed consent to (partially) disclose personal data, which in turn lead, for the most part, to an abandonment of privacy because users generally opt into, or even require the use of, Internet services.⁶⁹ With more or less *sink-or-swim* terms of use and consent requests, users voluntarily (or not) enter into “privacy contracts”⁷⁰ and thus become part of an ecosystem aimed at the exploitation of data.

In sum, the tension between exclusive access and openness in contemporary intellectual property law is generating new regulations on at least three fronts: 1.) Despite counter-initiatives, cultural expressions and goods are increasingly subjected to tightened intellectual property rights, which a number of commercial platforms partly based on openness have learned to deal with, while actual creators tend to lose opportunities to express themselves and make money. 2.) In software development, by contrast, legal innovations in the open-source movement have been able to open up sustainable access and cooperation opportunities; in this case, capitalist companies have had to adapt to ecologies beyond the terms of classical private property and have often found this to be lucrative. Research and development is a borderline case, where the law helps to enclose public services in a proprietary way, but private corporations also demand open-knowledge infrastructures in some contexts. 3.) A third front is emerging where capitalist actors use legal instruments that do not pertain to ownership of a specific product to appropriate exclusive advantages: from trade secrets, which are still anchored in property law, to data sovereignty based on personal rights, which in practice often means that people are asked to make data traces accessible in exchange for using free services.

In the following, we shift our perspective on exclusion and openness. Instead of reviewing legal structures that result from the condensation of divergent interests (with different power resources), we focus on the business models for profit-making in the information economy. In order to trace the profit motive, we continue to review equivalents to intellectual property that are not primarily formed in law, but rather in the economic practices of dealing with valuable goods and resources. Moreover, we move beyond concentrating on legal, technological or other forms of *exclusion*, since the point of many profit-making strategies is to attract and exploit as many productive contributions and as much user activity and attention as possible. Even the most salient monopoly strategies

⁶⁹ Cf. Daniel J. Solove, “Privacy Self-Management and the Consent Dilemma,” in *Harvard Law Review* 126, no. 7 (2013): 1880–1903.

⁷⁰ Seignani, *Privacy and Capitalism in the Age of Social Media*, 191.

of digital capitalism harness *selective openness*. This insight leads us to the final question of how such strategies interact with (newly) exclusive property rights.

3. Economic strategies: Openness and closure in digital capitalism

In digital capitalism there are different kinds of business models that promise profits. A well-known variety are business models aimed at the sale of information goods (such as software, content, or procedural knowledge). Legal (patent or copyright) protection allows these goods to be licensed in exchange for royalties. However, as will become clear in the discussion below, digital capitalism is often about direct profitable use rather than about the selling of knowledge, information and data. Examples here include the production of high-performance technologies, the generation of data-based services or the control of captive attention with purchasing power on the Internet. What is more, the provision of maintenance and support, the adaptation of existing software and customised software development make up a considerable part of digital business models that fall within (as well as below) *big tech*. The sources of value and profits vary as well. There have been many theses on the private capture of collective cognitive or cultural work, and this capture can be traced concretely in the case of companies that specialise in organising Internet interactions. It is also well known that some of the most important digital companies mainly depend on advertising fees paid by other businesses. Finally, there are business models that specialise in the private absorption of public funds; a notorious example (and also a case of diminished relevance of mere property titles) is large academic publishers who increasingly earn money from fees for open-access publications rather than standard subscription licences.⁷¹

Despite these differences, it is possible to formulate a number of general observations about the generation of profit in digital capitalism. As argued, openness is necessary for the (re-)production and enhancement of information goods on the one hand and on the other hand partially impedes the valorisation of these goods. Consequently, on the side of capital allowances must be made in some instances for knowledge, information and data to circulate openly (and free of charge), while in other instances there needs to be an option of resorting to private property arrangements or other ways of excluding others from access. This *dialectic of openness and closure*, in which openness is (often) necessary for production and closure is (in many cases) necessary for appropriating profits, needs to be analysed in its various forms.

⁷¹ Cf. Alexander Grossmann, Björn Brembs, "Current Market Rates for Scholarly Publishing Services (Version 2)," in *F1000Research*, last modified December 17, 2021, <https://doi.org/10.12688/f1000research.27468.2>.

Techno-economic ecosystems

There is a further hypothesis that serves to examine this dialectic more concretely. Digital capitalist companies usually have to use, control or even construct complex ecosystems in which the knowledge, information and data flows important to them can circulate.⁷² Such ecosystems include commercial actors who partly cooperate on open-access assets and partly compete on the basis of exclusivity. They also include non-commercial actors, customers and the general public, who actively or passively participate in producing and using publicly accessible commons, private and state-funded services. Hierarchies form between these participants and capitalist companies in particular strive for hegemonic positions within ecosystems. Therefore, we must also assess the transformation of knowledge-, information- and data-related social and technological power into economic power (money and the disposal of other people's labour).

The term ecosystem allows us to analyse more than just the specific logics platform companies, even if these remain important,⁷³ and to remain conceptually open to different connections that arise between the participants. Digital capitalist ecosystems exist in the broad forms of business or public-private cooperation networks, national innovation systems and transnational value chains,⁷⁴ as well as the narrower form of "platforms" that earn money from enabling certain (digital) transactions.⁷⁵ Yet even loosely integrated digital products such as technical maintenance services, software customisation or cultural artefacts can only be understood economically once their place in the respective ecology is clear.

The widely discussed trend towards platformisation can be explained by the relatively direct control over openness and closure achieved by those controlling the infrastructure. Examples include the overarching search, networking and marketplace infrastructures of Google, Facebook and Amazon, subscription-based music and video streaming providers,

⁷² The term *ecosystems* is often used in the literature and it is sometimes even seen as fundamental to understanding digital capitalist business strategies; cf. for example Kean Birch, D. T. Cochrane, "Big Tech: Four Emerging Forms of Digital rentiership," in *Science as Culture* 31, no. 1 (May 2021): 44–58, here 45. To our knowledge there is, however, no widely accepted definition of techno-economic *ecosystems*. Since existing definitions do not match our analytic purposes (for example Birch and Cochrane emphasise technological infrastructures rather than the social and economic roles of contributors), we present a tentative explanation of our own.

⁷³ Birch and Cochrane (ibid., 52 f.) go halfway towards making this point: They explicitly replace the narrow term *platform* with the broader notion of *ecosystem*, but restrict their ecosystem analysis to the GAFAM companies. In our view these companies are really examples of platform strategies, since a central part of their business models is to exert control over ecosystems.

⁷⁴ Cf. Cecilia Rikap, Bengt-Åke Lundvall, "Big Tech, Knowledge Predation and the Implications for Development," in *Innovation and Development* (2020): 1–28; Durand, Milberg, "Intellectual Monopoly," 411–22.

⁷⁵ Cf. Nick Srnicek, *Platform Capitalism* (Cambridge: Polity, 2017); Ulrich Dolata, "Internet – Platforms – Regulation: Coordination of Markets and Curation of Sociality," in *Research Contributions to Organizational Sociology and Innovation Studies* (February 2020), 1–29; Ulrich Dolata, Jan-Felix Schrape, "Platform Architectures: The Structuration of Platform Companies on the Internet," in *Research Contributions to Organizational Sociology and Innovation studies* (January 2022).

portals for car-hailing, booking, dating, crowdwork and much more. Beyond these well-known consumer portals a network of business-to-business platforms have been established. Amazon's most successful unit is not its marketplace, but the cloud provider Amazon Web Services (AWS). Moreover, most organisations use pre-arranged software services for their resource management, business interactions, online retailing or even for technological development. In these multifold contexts profitable command over knowledge, information and data flows can be achieved in various ways, for example by controlling the means of production required by other economic actors (such as financial resources, user data, or development environments), the exclusive control of knowledge advantages (e.g. through contractual agreements under private law, especially non-disclosure agreements) or the use of productive and distributive advantages (e.g. privileged relationships with consumers or important suppliers). The general point is that the owners of platforms (and meta-platforms) can exert direct control and enforcement power – from the choice of algorithms over the rules of interaction to the economic uses allowed for.⁷⁶ Socio-technical regulations⁷⁷ implemented by big platform companies are binding for all participants (e.g. in the Apple App Store or on the Amazon Marketplace). This is especially the case for those who design the market where suppliers and customers meet and are able to both monitor all interactions within that marketplace as serves their own interests (e.g. for demand analyses), while also regulating access to the platform and determining the conditions for individual participants (e.g. through price discrimination).⁷⁸

The theory of multi-sided markets (or, more recently, of “proprietary markets”)⁷⁹ is often used to explain the platform economy and the theory of value chains has been employed to analyse the economic advantages of innovation and technological dominance.⁸⁰ Both theories are helpful. The first approach contributes to understanding how intermediaries have acquired a new dominance in the digitised economy and how an extended set of free services can be afforded in Internet environments (see section 2 and below). The second approach helps to see how technology leaders increase their profits at the expense of less knowledge-intensive supplier companies, mostly in other countries and with particularly harsh exploitation. With regard to both approaches, however, it should

⁷⁶ Cf. Dzifa Ametowobla, Stefan Kirchner, *The Organization of Digital Platforms: Architecture and Interfaces in a Partial Organization Perspective*. Working Paper “Fachgebiet Digitalisierung der Arbeitswelt”, No. 04, Technische Universität Berlin, https://www.static.tu.berlin/fileadmin/www/10005075/Forschung/Publicationen/Diskussionspapiere/DP_No_4_Paper_on_line_v1.pdf.

⁷⁷ Cf. Dolata, Schrape, “Platform Architectures”.

⁷⁸ Cf. Philipp Staab, *Digitaler Kapitalismus. Markt und Herrschaft in der Ökonomie der Unknappheit* (Berlin: Suhrkamp, 2019), 176 ff.

⁷⁹ Cf. Staab, *Digitaler Kapitalismus*.

⁸⁰ Cf. the discussions by Rikap, Lundvall, “Big Tech, Knowledge Predation and the Implications for Development,” 7, and Durand, Milberg, “Intellectual Monopoly,” 410 f.

be critically noted that the activities in question are not linked by formal exchange relations alone. In digital ecosystems there is nearly always work done, but in some cases nothing is being exchanged for money. Therefore, it might be more appropriate to speak of an articulation of different economies as well as modes of production, circulation, consumption, and communication in the ecosystems.⁸¹

On the basis of these hypotheses and observations it becomes possible to rethink central economic categories in the field. We begin with remarks on the concept of monopoly, which is closely but untypically tied to neoclassical problematics of demand and supply and crucial to understanding the logics of business strategies and of renewed capitalist control. Complementary to this we outline a revised Marxist concept of rent, which is essential for understanding the source of monopoly profits. Both discussions relate to processes of innovation without giving it the central role assumed by Schumpeterian accounts. Our main point will be that the market value of property, including the value of goods and services sold by firms, increasingly depends on an only partly formalised and often incomplete control of larger contexts of informational interaction.

Open monopolies

Monopolies are nearly omnipresent in the information economy, albeit in different ways. In the most basic sense they lie at the heart of intellectual property. Copyrights and patent rights warrant monopolies by definition, limiting the right to reproduce a unique work or to employ newly invented procedures for a fixed period; trademarks and business secrets help to stabilise commercial monopolies over time (see section 2). In the neoclassical world, only these *simple exclusive monopolies* enable producers of goods such as movies, medication or software to cover high development costs, compensating them with the exclusive opportunity to benefit from cheap reproduction. The dark side of this arrangement is pricing power. While many of the monopolised goods compete on markets with elastic demand (if proprietary software A is too expensive, you will find a software B with similar functions at a lower price or for free), some of the strongest examples of knowledge intensive goods demonstrate the potentials of monopoly pricing. For example, Hepatitis C medication has been sold at prices exceeding its (re-)production costs by hundreds of dollars per dose⁸² and apparently BioNTech/Pfizer and Moderna

⁸¹ Cf. Dave Elder-Vass, *Profit and Gift in the Digital Economy* (Cambridge: Cambridge University Press, 2016), who draws attention to the importance of gift exchange in the digital economy; see also Sebastian Seignani, "Digital Labour and Prosumption Under Capitalism," in *Marx and the Robots: Networked Production, AI, and Human Labour*, eds. Florian Butollo, Sabine Nuss (London: Pluto Press, 2022), 228–41.

⁸² Cf. Mazzucato, *The Value of Everything*, 207.

increased prices for Covid vaccines by 50% at the point of their highest demand.⁸³ The contributions of publicly funded science to pharmaceutical research, the underprovision of medication to poorer world regions and the unwillingness of companies to innovate beyond the most profitable fields have also added to a sense of scandal concerning the whole sector.⁸⁴

At the same time, these factors point to the inherent complexity of monopoly strategies. In order to maintain their innovative capacities big pharma companies have to rely on networks of intellectual co-production in which large volumes of knowledge, information and data circulate more or less freely. They have a history of promoting openness where smaller firms could charge for such goods⁸⁵ and they even began to engage in product development partnerships in fields where market formation is only predicted for the future.⁸⁶ In sum, these companies monopolise “knowledge that was not mainly produced in-house but in multiple innovation networks integrated by multiple organizations.”⁸⁷ Such multi-layered “intellectual monopolies” (or *temporary technological monopolies*) can be seen as paradigmatic on the side of production, pertaining also to the leading Internet companies (who in turn also experiment in health data contexts).⁸⁸ On the side of consumption the picture is even more complex. State and insurance subsidised clients in need of life-saving drugs and vaccines are obviously a very special case, with purchasing power depending on more than mere market mechanisms. But other cases in which attracting customers or users is a main issue often also turn out to be special, not at least because monopolistic strategies tend to employ openness on that side too.

The laws of consumer attraction in information environments have become instant textbook knowledge.⁸⁹ The *network effect* is a classic starting point here. Infrastructures that become more valuable with every additional user have an inherent tendency towards a natural monopoly (or *infrastructure monopoly*). The most useful train network, address directory, document format, search engine, online retailer or messaging service is (in most respects) that which is used by virtually everyone. In other words, providing general infrastructures leads to a monopolistic position. Companies striving for

⁸³ Cf. “Corona-Pandemie: 13,1 Milliarden Euro für Impfdosen”, *Tagesschau*, last modified January 26, 2023, <https://www.tagesschau.de/investigativ/ndr-wdr/corona-impfstoff-kosten-101.html>.

⁸⁴ Cf. Mariana Mazzucato, Victor Roy, “Rethinking Value in Health Innovation. From Mystifications Towards Prescriptions,” in *Journal of Economic Policy Reform* 22, no. 2 (2019), 101–119.

⁸⁵ Cf. section 2 – and Sunder Rajan, *Biocapital*, 47–59.

⁸⁶ Cf. Javier Lezaun, Catherine M. Montgomery, “The Pharmaceutical Commons: Sharing and Exclusion,” in *Global Health Drug Development, Science, Technology, & Human Values* 40, no. 1 (2015), 3–29.

⁸⁷ Cf. Rikap, *Capitalism, Power and Innovation*, 38.

⁸⁸ Cf. Cecilia Rikap, “Rethinking Monopoly as a Power Relation: The Shift from Market to Intellectual Monopoly,” CITYPERC Working Paper No. 2023-01 (City University of London).

⁸⁹ For an influential early example, cf. Hal Varian, Carl A. Shapiro, *Information Rules. A Strategic Guide to the Network Economy* (Boston/Mass.: Harvard Business School Press, 1999).

infrastructure monopoly tend to distribute “loaded gifts”⁹⁰ to their users, not only as bait for paid services. Besides reproduction costs approaching zero, the logic of two-sided (or multi-sided) markets allows infrastructure providers to offer services for free. Once there is more than one type of customer – often buyers and sellers – the question of who pays for a service is up to the intermediary or platform, which then typically charges the sellers.⁹¹ In the most prominent case Google/Alphabet has achieved an unprecedented monopoly position in the global advertising market by offering a range of high-quality search services free of charge, accompanied by widely debated data collecting and processing strategies. Less blessed intermediaries who cannot avoid charging consumers often incur episodes of low or no profit margins in monopoly struggles and employ more straightforward strategies to bind clients to their services. Examples of cut-throat competition for digital market dominance include cultural-industrial platforms like Netflix or Spotify, but also Amazon’s volatile near-monopoly in online retail.⁹²

A more specific trend are various efforts to lock in private and business customers in ever more complex and never quite interoperable information service environments, either through frequent updates, or through *walled gardens* offering whole worlds of interrelated services and devices (most prominently in the case of Apple products). Lock-in strategies have been recommended since the early years of the Internet⁹³ and have often been highly successful. Yet, they are not without their pitfalls. In the pivotal case of smartphone operating systems Google’s strategy of keeping the core elements (of Android) open and free – with the company’s play store as the only compulsory exception – has won over Apple’s efforts to force its closed ecosystem on the general tech-loving public. A decade later the successful launch of ChatGPT (owned by Microsoft) has reopened the question of whether Google can keep its status as the main portal to the Internet, or whether potentially more expensive AI services will become an alternative. Aside from these battles between major players for infrastructure dominance the picture is rather mixed. While companies such as PayPal are apparently striving for an interoperability that is governed by their own services, providers like Microsoft and Adobe strengthened the lock-in side with launches like Office 365 or the Adobe Creative Cloud. On the development side some monopoly strategies are almost completely committed to openness. A vivid example are ostensibly open development environments such as

⁹⁰ Cf. Dave Elder-Vass, *Profit and Gift in the Digital Economy*, 171–181.

⁹¹ This mechanism is not new in itself; a well-known example are supermarkets and the text in which the notion of two-sided markets was coined starts with credit cards; cf. Jean-Charles Rochet, Jean Tirole, “Platform Competition in Two-Sided Markets,” in *Journal of the European Economic Association* 1, no. 4 (2003), 990–1029.

⁹² For the notion and the analysis of “volatile monopolies”, see Ulrich Dolata, “Volatile Monopole. Konzentration, Konkurrenz und Innovationsstrategien der Internet-Konzerne”, in *Berliner Journal für Soziologie* 24, no. 4 (2015): 505–529.

⁹³ See Varian, Shapiro, *Information rules*, 103–171.

GitHub, TensorFlow and *React*, which companies like Microsoft, Alphabet and Meta (continue to) make available to developers of software, artificial intelligence and websites. Access here is generally open and free (though it may be limited by users themselves). However, the providers can enhance their reputations, set standards, and recruit potential employees, so that they at the very minimum strengthen their position in the field and in best case scenarios achieve a dominant position. Although they do not own the products created in their environments and usually do not make a profit from them, they tend to exclude competing firms from important market opportunities.

In sum, our discussion of monopolies reveals two interconnected points. First of all, there is the paradoxical situation that only *simple exclusive monopolies* enable a kind of market dynamic, because it is the monopoly situation that allows for exclusive ownership to be upheld. From well-established cases like expensive medication to less stable models like proprietary software or cultural subscription platforms, firms have invested in rules and arrangements to ensure that they own the reproducible goods they provide. Second, the customer base and pricing power achieved by the most successful monopolistic strategies essentially depend on controlling semi-open circuits of socio-technical interaction and flows of information. What is most valuable in Google is not the patented search algorithm or the network of technologies that enable actual search experiences or advertising opportunities, but the status of being the main search engine of the (Western) world. Achieving and maintaining such a monopoly position requires continuous investment in (semi-)open contexts of production, use and related interactions. This logic is not only pertinent to infrastructure monopolies that afford inclusion rather than exclusion. It is also pertinent to the *temporary technological monopolies* of firms with leading innovative capacities. Moreover, openness not only matters for the few companies that occupy real monopolistic (or oligopolistic) positions, but also for those in less central positions of relative market dominance. As we show in the following section, the underlying logic of this “Give to Get”⁹⁴ is an expectation and extraction of rent. Furthermore, rent assumes a new meaning in the semi-open ecologies of digital capitalism and the information economy.

Rents on collectively produced means of production

In order to understand capitalist business models that rely on information ecologies, the concept of income through rent is fundamental. From a Marxist perspective extracting

⁹⁴ Cf. Oliver Nachtwey, Simon Schaupp, “Ungleicher Gabentausch – User-Interaktionen und Wertschöpfung auf digitalen Plattformen”, in *KZfSS Kölner Zeitschrift für Soziologie und Sozialpsychologie* 74 (2022): 59–80; here 62.

rent is a way of appropriating value produced elsewhere.⁹⁵ In order to extract rent one has to be able to monopolise advantages that allow for greater productivity and profitability than competitors can achieve. If the capitalist is not also the owner of the source of the advantage, they usually pay part of their profit to its owner. In some cases, as with real estate rented for housing, the rentier part can also largely exceed the productive costs and profits, such as those of house-keeping and administration. American economist Duncan Foley recognises a similarity between rentiers and capitalists in that they are both free riders on the system of surplus value production.⁹⁶ In general, "capitalist exploitation generates a pool of surplus value for which each capitalist competes through some kind of business plan or market position. In fact, it is not even necessary to be a capitalist in order to compete for a share of this pool of surplus value."⁹⁷ While this last remark helps us to reconstruct the logic of land ownership, professional fees or even high wages secured by unions, a specific combination of productive capitalist and rentier roles becomes especially interesting in digital environments. Capitalist information rentiers usually invest and employ labour, but they also manage to harness large quantities of the productive labour and cognitive and cultural activities of others outside their own firms.

A departure from Marx's classical theory is necessary in order to understand this trend. Marx only considered natural sources of rentier income, for example particularly fertile land. Later, however, the idea of income through rent was extended to include cultural and informational sources of productive advantage.⁹⁸ Information monopolies and rents possess two new qualities that traditional rents do not. On the one hand, monopolies can be rented out several times instead of only once, as is the case with land.⁹⁹ Similarly to non-informational factors of production,¹⁰⁰ this creates the possibility of appropriating enormous shares of the global pool of surplus value. On the other hand, unlike with natural resources, cultural and information rent always involves cooperative human activity to generate the benefits, even if these activities are often not measured in money, paid for by the beneficiaries or remunerated at all. This has led to debates about the suitability of the concept of exploitation in the context of information monopolies or

⁹⁵ Cf. Nick Srnicek, "Value, Rent, and Platform Capitalism," in *Work and Labour Relations in Global Platform Capitalism*, eds. Julieta Haidar, Maarten Keune (Cheltenham: Edward Elgar Publishing, 2021), 29–45; Ernest Mandel, *Marxist Economist Theory* (New York: Monthly Review Press, 1971), vol. 1, 276–304.

⁹⁶ Cf. Duncan K. Foley, "Rethinking Financial Capitalism and the 'Information' Economy," in *Review of Radical Political Economics* 45, no. 3 (June 2013): 257–268, here 260.

⁹⁷ Foley, "Rethinking Financial Capitalism and the 'Information' Economy," 259 f.

⁹⁸ Cf. David Harvey, "The Art of Rent: Globalization and the Commodification of Culture," in *Spaces of Capital. Towards a Critical Geography* (New York: Routledge, 2001), 394–411; Ralf Krämer, "Informationsrente", in *Historisch-Kritisches Wörterbuch des Marxismus (HKWM)*, Vol. 6/1, (Berlin: Argument-Verlag 2004), Columns 1100–1108.

⁹⁹ Cf. Foley, "Rethinking Financial Capitalism and the 'Information' Economy," 265.

¹⁰⁰ Cf. Cédric Durand, William Milberg, "Intellectual Monopoly in Global Value Chains," in *Review of International Political Economy* 27, no. 2 (2020): 404–29, here 421 f.

information intensive production.¹⁰¹ The term *exploitation* only makes sense if exploited labour is not reduced to waged labour or the production of profitably marketable goods. Thus, digital prosumption, cultural community activities and other unpaid or publicly paid activities in the ecosystems of knowledge, information, and data are central themes in the analysis of exploitation.

Various types of digital-capitalist rent are systematised in the literature.¹⁰² In empirical ecosystems, they are often distributed among different actors and can complement each other. “Enclave rents” can be generated from the (partial) “control of ecosystems,”¹⁰³ especially as a platform on which valuable data and direct payments can be collected; the use of the platform for a company’s own market advantage promises “reflexivity rents.” Such rents arise from the power (of platforms) to set rules for interactions, which can be exploited flexibly in competition. These authors also assume “expected monopoly rents” that are based not only on existing informational monopolies and advantages, but also on those expected in the future.¹⁰⁴ This is the case in particular with “data-driven innovation rent” when privileged access to data is turned into innovations through research and development.¹⁰⁵ Monitoring results from the ecosystem can perpetuate such knowledge advantages and also enable ongoing technological advancement (for example in the form of better trained Artificial Intelligence). Finally, “engagement rents” results from the measurement and datafication of different qualities of user activities, with some appearing to be more valuable than others.¹⁰⁶ Such differences can be exploited to generate returns when user groups are targeted with specific offers or taken into account in further product development.

These types of rent however, are mostly platform specific. Furthermore, they are basically conceived within a neoclassical logic of achieving advantageous market positions. A renewed Marxist theory that takes an interest in new forms of exploitation also needs to focus on the labour flowing into rent-yielding advantages.¹⁰⁷ In a very schematic way, four models can thus be distinguished. The widespread model of *pure information rent* presupposes that cognitive or cultural labour is only exerted once (both within and beyond capitalist firms), so that actors who manage to claim exclusive rights to a product

¹⁰¹ Cf. for this debate Sevigiani, “Digital Labour and Prosumption Under Capitalism”.

¹⁰² In order to avoid over-complexity, we only give some examples from Birch, Cochrane, “Big Tech,” and Durand, Milberg, “Intellectual Monopoly in Global Value Chains.”

¹⁰³ Cf. Birch, Cochrane, “Big Tech,” 47.

¹⁰⁴ Cf. *ibid.*, 51 f.

¹⁰⁵ Cf. Durand, Milberg, “Intellectual Monopoly in Global Value Chains,” 421 f.

¹⁰⁶ Cf. Birch, Cochrane, “Big Tech”, 52 f.

¹⁰⁷ Cf. e.g., Nick Srnicek, “Data, Compute, Labour,” in *Digital Work in the Planetary Market*, eds. Mark Graham, Fabian Ferrari (London: The MIT Press, 2022), 241–61.

can potentially acquire exponential income with increasing economies of scale.¹⁰⁸ On closer inspection this model is restricted to quite specific examples such as movies or books. In contrast, prosumer or producer activities that blur formerly established role distinctions in the market economy can be said to yield *produsage rent*.¹⁰⁹ If measuring and datafying user engagement pays out for platforms, this engagement itself obviously also contributes to the value being extracted. In this case it can be captured as a form of labour. And while the notion of 'labour' remains contested in the case of consumers looking for goods to buy, it is certainly adequate when users of cultural or other communication platforms invest time and effort to provide non-commercial content. Differently again, at sites of production that are further removed from consumer activities, income is dependent on a continuous and labour-intensive preservation of innovative advantage and market dominance. In such *temporary technological monopolies* (see above) firms can extract *technology-based pricing rent*. What makes this rent rather than mere extra profit (which has always accrued to technology leaders) is the pricing power derived from the relative monopoly position. The firms in question can impose prices on their customers and extract profit shares from producers further down the value chain.¹¹⁰ Finally, the exclusive or semi-open logic of the first three models is complemented by *rent from open innovation processes*. In this model the results of intellectual labour, which are made available without access restrictions, such as non-patented academic science or open-source software, become rent when only a few firms with the respective technological capacities are able to make productive use of them.

A good indicator for the presence of rent-seeking and income from rent is a wide variety of profit margins. Wherever income from rent can be (temporarily) accrued, these margins tend to be very high; yet, in order to get there long periods of loss-making or investment without direct returns have to be endured. An interesting case is *cloud computing*, which, with its rival core goods of computing power and server capacity, does not correspond to the usual descriptions of the information economy. Together with these goods such cloud services also include different variants of support software. Dominant providers like AWS, Microsoft Azure and Google sell proprietary Software as a Service (SaaS) as a component or module of Cloud as a Service (CaaS). An alternative model is to only charge for setting up and supporting the cloud. For example, the German

¹⁰⁸ For an early theory of these rents (and probably as the origin of the terminology), cf. John Braithwaite, Peter Drahos, *Information Feudalism: Who Owns the Knowledge Economy?* (New York: The New Press, 2007).

¹⁰⁹ A version of this model of rent can be found in Srnicek, "Value, Rent, and Platform Capitalism," who criticises theories of user labour, but concedes that privileged access to (products and traces of) user behaviour yield rent income for platforms (ibid., 30 f.). Srnicek himself does not speak of *produsage rents*, but prefers the conventional models of intellectual property rents, advertising rents and infrastructure rents.

¹¹⁰ Cf. Rikap, Lundvall, "Big Tech, Knowledge Predation and the Implications for Development"; Durand, Milberg, "Intellectual Monopoly," 21 f. Rikap generally speaks of 'intellectual monopoly rents', Durand and Milberg use the more specific notion of 'vertical natural monopoly rents'.

cloud provider *plusserver* offers the open-source Sovereign Cloud Stack on an equal footing with AWS, Azure, and the Google Cloud. The company *Nextcloud*, is popular with European state administrations, not only uses open-source software as a matter of principle, it also lets its customers operate their own servers in the spirit of data sovereignty. However, beyond these pure service models the oligopolistic battles rage on. The profit margins of the hyperscalers, which each serve between a tenth and a third of the market, currently range between 29 % profit (AWS) and 14 % loss (Google).¹¹¹ So far, the decisive profit-factor is neither pure labour nor mere ownership, but a techno-economic struggle for market leadership in expectation of future income with rent-enhanced profit margins.

The descriptive reconstruction of monopoly strategies and the explanatory accounts of rent extraction in the information economy obviously intersect at many points, for example when analysing the competition for rent-yielding monopoly positions. The common point is that particular firms appropriate shares of productive and social activity, which they only partly provide for themselves. Our analysis in this paper also offers a general explanation of the ways in which the dialectic of openness and closure informs strategies of appropriation today. Income from rent is essential to many businesses in the information economy, and monopolies on products, factors of production, productive advantages and market positions are fundamental for rent extraction. Yet the forms of monopolisation vary wildly, with exclusive intellectual property on the one side and network control under conditions of open and free access on the other. Therefore, economic actors in the information economy not only pursue highly different business strategies, they also entertain highly diverse relationships to the complex field of property rights.

What is still to be clarified is the precise relationship between new business strategies that have a strong influence on the prevailing practices of property and legal structures and innovations that integrate divergent interests and combine institutionalised justifications and sanctioning power. In our conclusion, we address this relationship and discuss the tensions between different parts of the analysis developed in this paper.

¹¹¹ Cf. "Margin Brawl. The Cloud-Computing Giants Are Vying to Protect Fat Profits," *The Economist*, last modified August 29, 2022, <https://www.economist.com/business/2022/08/29/the-cloud-computing-giants-are-vying-to-protect-fat-profits>.

Conclusion and outlook: Legal structures, economic strategies and patterns of justification

As noted above, the relationship between property law and economic property practices poses substantial questions when the legal and economic innovations addressed in this paper are considered in conjunction. In spite of obvious connections between, for example, property-oriented US legislation and the rise of knowledge intensive US companies since the 1980s, problems of the cultural industries and copyright innovations around 2000 or GPL licensing and the open-source investments of large digital companies, to date no systematic picture has taken shape. The legal trend towards an increasing proprietary closure of knowledge goods and para-proprietary limitations of information flows seems to move in a different direction than the monopolist strategies of harnessing openness, even if a tension between openness and exclusion is at play in both spheres. On a formal level this divergence can be explained by a relative autonomy of the legal sphere, which (in spite of accounts such as Katharina Pistor's *Code of Capital*) continues to integrate more social forces than just the biggest companies with the best-paid lawyers. Nonetheless, we still require a substantial understanding of changes in (intellectual) property that can integrate legal and economic innovations.

The highly general questions and theories with which we started might be of help here. The results of our discussion of legal and economic innovations in the information economy can be summed up by turning back to the questions deriving from property-based economic thought (section 1): How is it possible to possess and sell infinitely reproducible information goods? How can capitalist firms keep control of the means of production when societal flows and stocks of knowledge, information and data become a main productive force? And how can the inequalities stemming from the concentrated economic control of these goods and resources be justified to the diverse actors who participate and contribute? All three questions have legal (section 2) and economic answers (section 3).

Claims to property in information goods become problematic and urgent when specific economic actors either see their established income base and profits in jeopardy or perceive new profit opportunities; examples include the cultural industries and organisations of creative workers, parts of the software industry and sellers of research-intensive mass products such as medication. In the legal sphere, almost all of these actors tend to proceed rather conservatively, demanding tightened copyright, patents or other industrial property laws and protection on national and international levels. Even creative combinations of different legal instruments (including laws for consumer protection) often aim at the effective exclusion of non-owners, as has been shown in the cases of

data-generating patents and the construction of personal data as an alienable good. Alternative legal tendencies could only be observed in the case of public licences for open-source software, whose developers have now established a peaceful coexistence with profit-oriented companies. To some extent this is also the case with cultural and scientific creators who can afford to use CC licenses. The economic actors who are rather interested in a (semi-)open circulation of content, information and data have found ways to work with all these different property claims or renunciations. However, they do not seek legal innovations in the sphere of intellectual property rights. Thus, their innovative property practices remain relatively invisible here.

The control of productive and user ecologies of knowledge, information, communication and data is crucial for exactly these different, property-relaxed fractions or interests of capital in the information economy. Examples include the GAFAM companies and many other platform operators, parts of the software industries and the upstream-activities of pharmaceutical companies or other technological leaders in fastly evolving knowledge-intensive sectors. The point is not that these firms would work without property claims on means of production or specific goods and services. A pivotal component of their economic strategies, however, is to strive for monopoly positions by providing free access to users and producers. Much of their gains depend on extracting rents from collectively produced and enhanced means of production, which can be (at best) partly controlled through ownership. Therefore, these economic actors relate to the structures of *property law* in different ways than businesses that mainly depend on the selling of information goods. Instead of seeking more regulation they mainly use existing legal devices in order to enhance and defend the control of their specific ecologies, from advertising markets to operating systems.

The resulting distribution of income and power does not need to be justified in a systematic way in order to work. Sometimes even strict legal regulations are accepted, especially when combined with convenience, as is the case with subscription platforms for cultural content. Sometimes the simple fact that cognitive workers like software developers have to earn a living mitigates questions about the just distribution of collectively produced goods. Nevertheless, different participants – from employees to consumers – are driven to engage in economic practices with more or less energy according to their perceptions of legitimacy. Explicit critique also plays a role in changing or reorganising organisational structures and legal patterns. In the information economy established justifications begin to erode at certain points and new patterns emerge. An interesting and yet undecided example are the property rights and profits of pharmaceutical companies. While the business models, legal frameworks and profit

margins of these companies have remained stable so far, critique is becoming more pressing and coalitions are shifting. The TRIPS regulations, which had been a particularly strong global device of Western property claims at the end of the last century, have made no progress in the last 20 years. Even the US government joined the movement for a TRIPS waiver for vaccine-related property rights in the Covid pandemic. With regard to possible new justifications of intellectual property or equivalent forms of exclusion our analysis has pointed to several interesting patterns. A central and ambivalent case is the protection of personal data, which is increasingly codified in law and also integrated in business practices. More generally, the security of sensitive data, namely those of businesses and other organisations, is a strong practical argument for structuring information environments in a proprietary way and defining clear responsibilities; if the person or organisation buying information goods is harmed, support services are available and liability issues are settled. Finally, the aggregate performance of information structures tends to make the services of large intermediaries popular and difficult to do without.

In order to further analyse the topic raised in the last paragraph the conceptual tools of the sociology of justification in the tradition of Boltanski, Thévenot and Chiapello would be obviously helpful. Generally, the analysis and discussion presented in this paper call for further empirical investigation of property-related practices beyond strictly legal and economic contexts. We have only superficially explored the ways in which new legislation is negotiated by interested parties, how public and private knowledge producers cooperate or firms make business-to-business deals on information goods.

Even with these additions, however, a meta-descriptive and meta-explanatory problem remains. Neither economic and legal nor informal arrangements resolve the tension that in the information economy public goods and collective services are privately appropriated and that in many cases they are used rather unproductively. A sociology of intellectual property should therefore always keep in mind the extent to which private property and entrepreneurship do not solve problems, even measured by capitalist standards, and only provide advantages to small groups at the expense of the large majority. This brings into focus systemic questions of justification.

References

- “Corona-Pandemie: 13,1 Milliarden Euro für Impfdosen”, *Tagesschau*, last modified January 26, 2023, <https://www.tagesschau.de/investigativ/ndr-wdr/corona-impfstoff-kosten-101.html>.
- “France fines Google and Facebook over cookies,” *BBC News*, last modified January 7, 2022, <https://www.bbc.com/news/technology-59909647>.
- “Margin Brawl. The Cloud-Computing Giants Are Vying to Protect Fat Profits,” *The Economist*, last modified August 29, 2022, <https://www.economist.com/business/2022/08/29/the-cloud-computing-giants-are-vying-to-protect-fat-profits>.
- “The GNU Manifesto,” *Free Software Foundation*, last modified January 1, 2022, <https://www.gnu.org/gnu/manifesto.html>.
- Ametowobla, Dzifa, and Stefan Kirchner, *The Organization of Digital Platforms: Architecture and Interfaces in a Partial Organization Perspective*. Working Paper “Fachgebiet Digitalisierung der Arbeitswelt”, No. 04, *Technische Universität Berlin*, https://www.static.tu.berlin/fileadmin/www/10005075/Forschung/Publikationen/Diskussionspapiere/DP_No_4_Paper_online_v1.pdf.
- Barker, Alex. “‘Cookie Apocalypse’ Forces Profound Changes in Online Advertising,” *Financial Times*, last modified February 26, 2020, <https://www.ft.com/content/169079b2-3ba1-11ea-b84f-a62c46f39bc2>.
- Benkler, Yochai. “Commons-Based Strategies and the Problems of Patents,” in *Science* 305, no. 5687 (August 2004): 1110–1111.
- Birch, Kean, and D. T. Cochrane. “Big Tech: Four Emerging Forms of Digital rentiership,” in *Science as Culture* 31, no. 1 (May 2021): 44–58.
- Bollinger, Juli M. et al. “BRCA1/2 Variant Data-Sharing Practices,” in *The Journal of Law, Medicine and Ethics* 41, no. 1 (2019): 88–96.
- Boyle, James. *Shamans, Software, and Spleens: Law and the Construction of the Information Society* (Cambridge: Harvard University Press, 1996).
- Boyle, James. *The Public Domain. Enclosing the Commons of the Mind* (New Haven, CT: Yale University Press, 2008).
- Braithwaite, John, and Peter Drahos. *Information Feudalism. Who Owns the Knowledge Economy?* (New York: The New Press, 2007).
- Brembs, Björn, and Alexander Grossmann. “Current Market Rates for Scholarly Publishing Services (Version 2),” in *F1000Research*, last modified December 17, 2021, <https://doi.org/10.12688/f1000research.27468.2>.

- Dolata, Ulrich, and Jan-Felix Schrape. "Platform Architectures: The Structuration of Platform Companies on the Internet," in *Research Contributions to Organizational Sociology and Innovation studies* (January 2022).
- Dolata, Ulrich. "Internet – Platforms – Regulation: Coordination of Markets and Curation of Sociality," in *Research Contributions to Organizational Sociology and Innovation Studies* (February 2020): 1–29.
- Dolata, Ulrich. "Volatile Monopole. Konzentration, Konkurrenz und Innovationsstrategien der Internet-Konzerne", in *Berliner Journal für Soziologie* 24, no. 4 (2015): 505–529.
- Dreyfuss, Rochelle Cooper. "Double or Nothing: Technology Transfer Under the Bayh-Dole Act," in *Business Innovation and the Law: Perspectives from Intellectual Property, Labour, Competition and Corporate Law*, eds. John Duns et al. (New York: Edward Elgar Publishing, 2013), 52–73.
- Durand, Cédric, and William Milberg, "Intellectual Monopoly in Global Value Chains," in *Review of International Political Economy* 27, no. 2 (2020): 404–429.
- Dyer-Witheford, Nick. *Cyber-Proletariat: Global Labour in the Digital Vortex* (London: Pluto Press, 2015).
- Elder-Vass, Dave. *Profit and Gift in the Digital Economy* (Cambridge: Cambridge University Press, 2016).
- Fischer, Georg. "Die kleinste lizenzierbare Einheit: Schrumpfen oder Multiplikation von Eigentumsansprüchen?", *SFB Blog Transformation of Property*, last modified August 30, 2022, <https://sfb294-eigentum.de/de/blog/die-kleinste-lizenzierbare-einheit-schrump-fen-oder-multiplikati/>.
- Foley, Duncan K. "Rethinking Financial Capitalism and the 'Information' Economy," in *Review of Radical Political Economics* 45, no. 3 (June 2013): 257–268.
- Guadamuz, Andres. "The Treachery of Images: Non-fungible Tokens and Copyright," in *Journal of Intellectual Property Law & Practice* 16, no. 12 (December 2021): 1367–1385.
- Hardt, Michael, and Antonio Negri. *Commonwealth* (Cambridge: Belknap Press of Harvard University Press, 2009).
- Harvey, David. "The Art of Rent: Globalization and the Commodification of Culture," in *Spaces of Capital. Towards a Critical Geography* (New York: Routledge, 2001), 394–411.
- Herman, Bill D. *The Fight over Digital Rights: The Politics of Copyright and Technology* (Cambridge: Cambridge University Press, 2013).

- Huws, Ursula. "Material World: The Myth of the Weightless Economy," in *The Making of the Cybertariat: Virtual Work in a Real World*, ed. Ursula Huws (New York: Monthly Review Press, 2003), 126–151.
- Krämer, Ralf. "Informationsrente", in *Historisch-Kritisches Wörterbuch des Marxismus (HKWM)*, Vol. 6/I, (Berlin: Argument-Verlag 2004), Columns 1100–1108.
- Lemley, Mark. "IP in a World Without Scarcity," in *New York University Law Review* 90, no. 2 (May 2015): 460–515.
- Lessig, Lawrence. *Code and Other Laws of Cyberspace* (New York: Basic Books, 1999).
- Lessig, Lawrence. *Code: Version 2.0* (New York: Basic Books, 2006).
- Lezaun, Javier, and Catherine M. Montgomery. "The Pharmaceutical Commons: Sharing and Exclusion," in *Global Health Drug Development, Science, Technology, & Human Values* 40, no. 1 (2015): 3–29.
- Litman, Jessica. "What We Don't See When We See Copyright As Property," in *The Cambridge Law Journal* 77, no. 3 (November 2018): 536–558.
- Lund, Arwid, and Mariano Zukerfeld, *Corporate Capitalism's Use of Openness: Profit for Free?* (Cham: Palgrave Macmillan, 2020).
- Lundvall, Bengt-Åke, and Cecilia Rikap. "Big Tech, Knowledge Predation and the Implications for Development," in *Innovation and Development* (2020): 1–28.
- Machlup, Fritz. *The Production and Distribution of Knowledge in the United States* (Princeton: Princeton University Press, 1962).
- Mandel, Ernest. *Marxist Economist Theory* (New York: Monthly Review Press, 1971), vol. 1.
- Marx, Karl. "Grundrisse zur Kritik der politischen Ökonomie (1857-58)", in *Marx Engels Werke (MEW)*, vol. 42 (Berlin: Dietz Verlag, 1983).
- Marx, Karl. "Outlines of the Critique of Political Economy (Rough Draft of 1857-58)," in *Marx Engels Collected Works (MECW)*, vol. 29 (London: Lawrence & Wishart, 2010).
- Mazzucato, Mariana, and Victor Roy. "Rethinking Value in Health Innovation. From Mystifications Towards Prescriptions," in *Journal of Economic Policy Reform* 22, no. 2 (2019): 101–119.
- Mazzucato, Mariana. *The Entrepreneurial State: Debunking Public Vs. Private Sector Myths* (London: Anthem Press, 2015).
- Mazzucato, Mariana. *The Value of Everything: Making and Taking in the Global Economy* (New York: PublicAffairs, 2018).
- Nachtwey, Oliver, and Simon Schaupp. "Ungleicher Gabentausch – User-Interaktionen und Wertschöpfung auf digitalen Plattformen", in *KZfSS Kölner Zeitschrift für Soziologie und Sozialpsychologie* 74 (2022): 59–80.

- Nuss, Sabine. *Copyright & Copyriot. Aneignungskonflikte um geistiges Eigentum im informationellen Kapitalismus* (Münster: Westfälisches Dampfboot, 2006).
- O'Neil, Mathieu et al. "Open Source Has Won and Lost the War': Legitimising Commercial-Communal Hybridisation in a FOSS Project," in *New Media & Society* 23, no. 5 (May 2021): 1157-1180.
- O'Neil, Mathieu et al. "The Duality of Peer Production," in *The Handbook of Peer Production*, eds. O' Neil et al. (Hoboken: Wiley Blackwell, 2020), 1-17.
- Pagano, Ugo. "The Crisis of Intellectual Monopoly Capitalism", in *Cambridge Journal of Economics* 38, 2014: 1409-1429.
- Pfeiffer, Sabine. *Digital Capitalism and Distributive Forces* (Bielefeld: transcript, 2022).
- Pistor, Katharina. *The Code of Capital: How the Law Creates Wealth and Inequality* (Princeton, NJ: Princeton University Press, 2019).
- Popp Berman, Elizabeth. *Creating the Market University: How Academic Science Became an Economic Engine* (Princeton: Princeton University Press, 2012).
- Reda, Felix. "CJEU Says Upload Filters Must Respect User Rights – But What If They Don't?," *Digital Freedom Fund*, last modified May 11, 2022, <https://digitalfreedomfund.org/cjeu-says-upload-filters-must-respect-user-rights-but-what-if-they-dont/>.
- Rikap, Cecilia. "Rethinking Monopoly as a Power Relation: The Shift from Market to Intellectual Monopoly," CITYPERC Working Paper No. 2023-01 (City University of London).
- Rikap, Cecilia. *Capitalism, Power and Innovation: Intellectual Monopoly Capitalism Uncovered* (New York: Routledge, 2021).
- Rochet, Jean-Charles, and Jean Tirole. "Platform Competition in Two-Sided Markets," in *Journal of the European Economic Association* 1, no. 4 (2003): 990-1029.
- Rogler, Anna. *Inklusive Immaterialgüterrechte* (Berlin: Duncker & Humblot, 2020).
- Schrage, Jan-Felix. "Open Source Communities: The Sociotechnical Institutionalization of Collective Invention," in *Collectivity and Power on the Internet: A Sociological Perspective*, eds. Ulrich Dolata, Jan-Felix Schrage (Cham: Springer, 2018), 57-83.
- Schumpeter, Joseph A. *The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle* (New Jersey: Transaction Publishers, 1983).
- Schumpeter, Joseph A. *Theorie der wirtschaftlichen Entwicklung* (Leipzig: Duncker & Humblot, 1912).
- Seignani, Sebastian. "Digital Labour and Prosumption Under Capitalism," in *Marx and the Robots: Networked Production, AI, and Human Labour*, eds. Florian Butollo, Sabine Nuss (London: Pluto Press, 2022), 228-41.

- Sevignani, Sebastian. *Privacy and Capitalism in the Age of Social Media* (New York: Routledge, 2016).
- Shapiro, Carl A., and Hal Varian. *Information Rules. A Strategic Guide to the Network Economy* (Boston/Mass.: Harvard Business School Press, 1999).
- Sichelman, Ted, and Brenda M. Simon. "Data-Generating Patents," in *Northwestern University Law Review* 111, no. 2 (February 2017): 377–438.
- Silbey, Jessica. *Against Progress: Intellectual Property and Fundamental Values in the Internet Age* (Stanford: Stanford University Press, 2022).
- Slee, Tom. *What's Yours is Mine. Against the Sharing Economy* (New York, London: Or Books, 2015).
- Solove, Daniel J. "Privacy Self-Management and the Consent Dilemma," in *Harvard Law Review* 126, no. 7 (2013): 1880–1903.
- Srnicek, Nick. "Data, Compute, Labour," in *Digital Work in the Planetary Market*, eds. Mark Graham, Fabian Ferrari (London: The MIT Press, 2022), 241–261.
- Srnicek, Nick. "Value, Rent, and Platform Capitalism," in *Work and Labour Relations in Global Platform Capitalism*, eds. Julieta Haidar, Maarten Keune (Cheltenham: Edward Elgar Publishing, 2021), 29–45.
- Srnicek, Nick. *Platform Capitalism* (Cambridge: Polity, 2017).
- Staab, Philipp. *Digitaler Kapitalismus. Markt und Herrschaft in der Ökonomie der Unknappheit* (Berlin: Suhrkamp, 2019).
- Staab, Philipp. *Falsche Versprechen. Wachstum im Digitalen Kapitalismus* (Hamburg: Hamburger Edition, 2016).
- Stiglitz, Joseph. "Knowledge as a Global Public Good," in *Global Public Goods: International Cooperation in the 21st Century*, eds. Inge Kaul et al. (Oxford: Oxford University Press, 1999), 308–325.
- Sunder Rajan, Kaushik. *Biocapital: The Constitution of Postgenomic Life* (Durham: Duke University Press, 2006).
- Tilly, Charles. *Durable Inequality* (Berkeley: University of California Press, 1998).

Legal References

- "Debates: 8.4. Copyright in the Digital Single Market (A8-0245/2018 - Axel Voss)," *European Parliament*, last modified March 26, 2019, https://www.europarl.europa.eu/doceo/document/CRE-8-2019-03-26-ITM-008-04_EN.html.

“EU Digital Markets Act and Digital Services Act explained,” *European Parliament*, last modified July 5, 2022,

<https://www.europarl.europa.eu/news/en/headlines/society/20211209STO19124/eu-digital-markets-act-and-digital-services-act-explained>.

“General Data Protection Regulation (GDPR),” *gdpr-info.eu*, accessed December 7, 2022, <https://gdpr-info.eu/>.

“Proposal for a Directive Of The European Parliament And Of The Council on copyright in the Digital Single Market”, Brussels, 14.9.2016, COM(2016) 593 final, 2016/0280(COD).

“Regulation (EU) 2022/1925 of the European Parliament and of the Council of 14 September 2022 on contestable and fair markets in the digital sector and amending Directives (EU) 2019/1937 and (EU) 2020/1828 (Digital Markets Act),” *Official Journal of the European Union*, last modified October 12, 2022, <https://eur-lex.europa.eu/eli/reg/2022/1925/oj>.

“Regulation (EU) 2022/2065 of the European Parliament and of the Council of 19 October 2022 on a Single Market For Digital Services and amending Directive 2000/31/EC (Digital Services Act),” *Official Journal of the European Union*, last modified October 27, 2022, <https://eur-lex.europa.eu/eli/reg/2022/2065/oj>.

Council Directive 93/98/EEC of 29 October 1993, harmonising the term of protection of copyright and certain related rights, <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:31993L0098>.

Creative Commons, “Creative Commons Announced,” last modified May 16, 2002, <https://creativecommons.org/2002/05/16/creativecommonsannounced-2/>.

Creative Commons, “License design and rationale,” accessed December 7, 2022, <https://creativecommons.org/licenses/>.

Deutscher Bundestag, “Urheberrecht soll für digitalen Binnenmarkt fit gemacht werden”, accessed December 7, 2022,

<https://www.bundestag.de/dokumente/textarchiv/2021/kw12-de-digitales-urheberrecht-826552>.

Directive (EU) 2019/790 of the European Parliament and of the Council of 17 April 2019 on copyright and related rights in the Digital Single Market and amending Directives 96/9/EC and 2001/29/EC, Bruxelles, 17 April 2019, L 130/108, Recital 70, accessed December 7, 2022, <https://eur-lex.europa.eu/eli/dir/2019/790/oj>.

Public Law 105–298, 105th Congress, (“An act to amend the provisions of title 17, United States Code, with respect to the duration of copyright, and for other purposes ...”),

<https://www.govinfo.gov/content/pkg/PLAW-105publ298/pdf/PLAW-105publ298.pdf>.

Public Law 105–304, 105th Congress, Digital Millennium Copyright Act,

<https://www.govinfo.gov/content/pkg/PLAW-105publ304/html/PLAW-105publ304.htm>.

U.S. Const. art. I, § 8, cl. 8, “Intellectual Property,” accessed December 7, 2022,

<https://constitution.congress.gov/browse/article-1/section-8/clause-8/>.

Sonderforschungsbereich/Transregio 294

STRUKTURWANDEL DES EIGENTUMS

This working paper examines the relationship between property and profitability in the information economy. The inherent openness of information goods poses a problem for the enforcement of private interests which are typically protected by various intellectual property laws and exclusive, proprietary access to these goods. Contrary to this strategy of exclusion, capitalist market leaders in the digital economy pursue salient strategies of selective openness and in turn profit from network and lock-in effects.

Actual business strategies often also combine elements of openness and exclusion, which make use of an interplay of complex legal arrangements in and beyond intellectual property. To reconstruct the connections between the legal and economic embedding of information goods, we review innovations in the field of intellectual property rights and ask how they relate to divergent interests of capital and other market participants. The aim of the paper is to provide an overview of hybrid and contradictory strategies and structures of techno-economic ecosystems and to lay the groundwork for further research.